Canadian Journal of Fisheries and Aquatic Sciences
Journal canadien des sciences halieutiques et aquatiques

Pore Water Physicochemical Constraints on the Endangered Clubshell Mussel, *Pleurobema clava*

Journal:	<i>Canadian Journal of Fisheries and Aquatic Sciences</i>
Manuscript ID	cjfas-2015-0442.R2
Manuscript Type:	Article
Date Submitted by the Author:	05-Apr-2016
Complete List of Authors:	Roley, Sarah; Michigan State University, W.K. Kellogg Biological Station; University of Notre Dame, Biological Sciences Tank, Jennifer; University of Notre Dame
Keyword:	BIVALVES < Organisms, sedimentation, dissolved oxygen, ammonia

Running head: physicochemical constraints on the clubshell mussel

Pore Water Physicochemical Constraints on the Endangered Clubshell Mussel, *Pleurobema clava*

Sarah S. Roley^{1,2*} and Jennifer L. Tank^{1,3}

¹Department of Biological Sciences, University of Notre Dame, Notre Dame, IN 46556

²Current address: W.K. Kellogg Biological Station, Michigan State University, 3700 E Gull Lake Dr, Hickory Corners, MI 49060, phone: +1 269-671-2534, fax: +1 269-671-2333, roleysar@msu.edu

³Email address: tank.1@nd.edu

*Corresponding Author, Phone: 269-671-2534, Fax: 269-671-2333, Email: roleysar@msu.edu

Abstract

Freshwater mussels are in decline worldwide, but it remains challenging to link specific stressors to mussel declines. The clubshell mussel (*Pleurobema clava*) is a federally endangered species that spends most of its life completely buried beneath stream sediments. We tested the hypothesis that clubshell's decline stems, in part, from low pore water dissolved oxygen (DO) concentrations and toxic ammonia (NH₃) levels, resulting from sedimentation of interstitial pore spaces. We measured pore water DO, NH₃, interstitial sedimentation rates, and sediment organic matter content in the Tippecanoe River (Indiana, USA), at sites that spanned a range of clubshell populations, including two sites devoid of clubshell. We found little evidence for pore water NH₃ stress, but pore water DO generally declined with clubshell population and dipped below stress thresholds more frequently at non-clubshell sites than at sites with clubshell. In addition, interstitial sedimentation rates generally increased as clubshell populations declined, suggesting that the low DO concentrations were the result of decreased pore water/surface water exchange. As a result, we conclude that maintaining or improving habitat for clubshell mussels will require the reduction of riverine sediment loading.

Key words: mussels, ammonia, sedimentation, dissolved oxygen

Introduction

Freshwater mussels are one of the most imperiled groups of organisms in the world; 72% of unionid mussel species in the United States are threatened, endangered, or of special concern (Williams et al. 1993), and worldwide, 42% of recorded extinctions are mollusks (Lydeard et al. 2004). The extinction rate of freshwater fauna in the United States is comparable to species loss rates in tropical rainforests, with mussel extinctions projected to increase substantially in future decades (Ricciardi and Rasmussen 1999). Their high extinction rates are partly a result of the numerous stressors faced by aquatic ecosystems (Strayer 2006) combined with poorly-informed management; it is often difficult to isolate the threats facing mussel species in particular ecosystems.

Identifying factors affecting mussel populations can be challenging because of the many potential freshwater stressors, the unique life history of mussels, and a lack of basic knowledge about these animals. Previously-identified stressors to freshwater mussels include impoundments, pollution, habitat destruction, overharvesting, predation, climate change, lack of fish hosts for early life-stages, invasive species, changes in watershed land use, and small population size (Allan 2004, Geist and Auerswald 2007, Downing et al. 2010, Österling et al. 2010, Owen et al. 2011, Strayer and Malcolm 2012). Moreover, it is likely that most species experience multiple stressors at the same time. In addition, there is often a temporal lag between the onset of stressors and a perceived decline in the mussel population, because mussels are generally long-lived and can survive for decades (McMahon and Bogan 2001; Watters et al. 2009). Juveniles are more vulnerable to many threats than are adults, and low recruitment will eventually lead to population declines, although declines may not be evident until long after a stressor occurred (Strayer 2008). Finally, for many mussel species, knowledge of basic life

history traits, such as habitat preferences, reproductive timing, and feeding strategies, is absent, which can inhibit evaluation of current conditions (Strayer 2006).

Pleurobema clava, the clubshell mussel, is a federally endangered species (USFWS 1994) that was once widespread across the Ohio River and Maumee River Valleys. At last count, its range had contracted to 21 streams, only 7 of which have reproducing populations (USFWS 1994; USFWS 2009). Although it may surface periodically, the clubshell spends most of its adult life buried beneath the sediments, and depends on percolation of surface water for food and oxygen (Parmalee and Bogan 1998; Watters 2007; Watters et al. 2009). Similarly, the juvenile phase of most unionids is spent beneath the stream sediments, although they may surface if pore water conditions become unsuitable (Yeager et al. 1994; Sparks and Strayer 1998; Watters 2007), and thus insights into specific stressors on the clubshell may also elucidate stressors on juveniles of many mussel species.

One of the remaining reproducing populations of clubshell occurs in the Tippecanoe River, a tributary of the Wabash River in north-central Indiana, USA. Land use surrounding the Tippecanoe River is almost entirely row crop agriculture (>85% land use), which typically leads to high nutrient and sediment loads (Allan 2004; Blann et al. 2009). Excess nutrients and sediments may limit the clubshell in a number of ways. Fine sediments fill gravel interstices and prevent exchange between oxygen-rich surface water and sub-surface sediments (Wood and Armitage 1997; Österling et al. 2008). In addition, microbial decomposition of sediment organic matter results in the consumption of interstitial dissolved oxygen (DO), and low DO can kill or stress both adult and juvenile mussels (Chen et al. 2001; Sparks and Strayer 1998). Sediments can also be a source of ammonium (NH_4^+), which is mineralized during organic matter decomposition (Dodds 2002). Ammonium is present in two forms: the non-toxic NH_4^+ and toxic

ammonia (NH_3) (Augspurger et al. 2003; Mummert et al. 2003; Newton and Bartsch 2007).

Surface water nutrient loads could also influence clubshell, by providing NH_3 directly and by fueling algal blooms, which consume DO when they die and decompose (Dodds 2002).

The goal of this study was to identify stressors on the clubshell mussel, with a focus on sub-surface, pore water conditions that may also provide insight into habitat stressors possibly experienced by juvenile mussels. We hypothesized that clubshell mussels in the Tippecanoe River are limited by low pore water DO and high pore water NH_3 concentrations, which result from high rates of interstitial sedimentation and nutrients derived from agricultural runoff from the surrounding watershed. By measuring both the potential direct stressors (e.g., DO and NH_3) and the indirect stressors (e.g., sedimentation rate, sediment organic matter content), we provide a potential mechanistic linkage between clubshell habitat and watershed land use.

Methods

Site Description

We conducted all of our sampling in the upstream one-third of the Tippecanoe River, which encompasses approximately 60 river km (Fig. 1) and is where most of the extant clubshell are located. All sites harbored clubshell within the last 25 years (Cummings et al. 1987; ESI 1993; USFWS 1998; Myers-Kinzie and Bright 2005; IDNR 2006), but now can be roughly characterized as either 1) non-clubshell (OCS) sites, where clubshell are absent or below detection; or 2) sites that currently have live clubshell (CS). Led by a permitted mussel biologist at the Indiana Department of Natural Resources, we completed mussel surveys at numerous potential sites. During our searches, we gently raked away the top layer of stream sediment by hand and with mussel rakes, in order to find buried clubshell specimens. We chose the 6 sites that provided the greatest range in clubshell populations (Table 1). We initially surveyed the sites

in July 2008, and then surveyed them again in September 2010, near the end of our study. The sites were all at least 5 km apart, which was sufficient to avoid spatial autocorrelation of pore water conditions, based on suggested relationships between sinuosity and hyporheic patch heterogeneity (Braun et al. 2012).

All sites were approximately 100 m², and encompassed most of the mussel bed, when a defined mussel bed was present. The mussel beds were typically in a shallow run of the river, with approximately uniform water velocity and depth across the entire bed. In addition to characterizing sites as CS and OCS, we also ranked the sites from 1-6 for clubshell population size (hereafter, CS rank), with rank 1 having the most clubshell, and rank 6 having no clubshell and the fewest total individual mussels (Table 1). We used population rank instead of a more quantitative measure, such as change in clubshell population through time, because previous surveys did not include all of our sites in the same year. We also ranked the sites by total mussel population (hereafter, total mussel rank), with rank 1 the site with the most live native individual mussels found per minute of searching and rank 6 the site with the least number of live native individual mussels (Table 1). In ranking the sites by the total mussel population, we can examine whether pore water conditions affect the total mussel population, as well, presumably by limiting recruitment.

We sampled each site every two weeks in the summers of 2009 and 2010. Our sampling season began when we were able to safely enter the river and take samples, and continued through early October. In 2009, the summer was unusually wet and cool, and high water limited the number of sampling dates. In contrast, the summer of 2010 had more typical temperatures and precipitation, and river flows were normal, so we were able to obtain more measurements.

125 *Pore Water Sampling*

126 At each site, we deployed 5 pore water oxygen samplers (Heywood and Walling 2007).
127 The samplers consisted of a perforated 1 cm (3/8”) polyethylene tube placed inside 2.5 cm (1”)
128 well screen, which was capped at both ends, with a 1 cm hole drilled in one cap to allow the
129 polyethylene tubing to extend just past the end of the sampler. We attached a sampling port (1
130 cm tubing with a one-way valve) with a 90° elbow, which extended up past the sediment-water
131 interface. At each site, we deployed 5 samplers by burying them so that the bottom of each
132 sampler was approximately 10 cm deep, and would provide a pore water sample from 7.5-10 cm
133 depth. To prevent the samplers from moving, we pounded rebar into the sediments at both ends
134 of the sampler and secured each end with cable ties.

135 To measure pore water DO, we attached 0.5 cm tubing to the one-way valve and
136 connected the tubing to a Hydrolab minisonde (Hach, Loveland, CO) via a peristaltic pump
137 (Watson-Marlow, Arlington, MA). We modified the minisonde calibration cup by drilling two
138 holes (one at the top and one at the bottom, on opposite sides) and attaching 0.5 cm nipples, and
139 then attached the outlet of the peristaltic pump tubing to one of the nipples, and used the other as
140 an outlet. Prior to pumping, we filled the pump tubing and sonde calibration cup with surface
141 water, in order to avoid mixing of pore water and atmospheric oxygen; then we pumped the
142 water from the sampler, while recording DO, temperature, and pH every 5 s. Typically, DO
143 dropped steadily, as the surface water was flushed out of the tubing and calibration cup, followed
144 by a brief plateau as pore water from the sampler reached the sonde. Then DO would rise, as
145 surface water was pulled into the sampler, replacing pore water. We calculated the time to pore
146 water arrival at the sonde, and recorded DO as the plateau concentration during this window
147 (Heywood and Walling 2007). On one sampling date, we simultaneously deployed

microelectrodes (e.g., Kemp and Dodds 2001) to test our pore water DO method. The microelectrode needle cannot penetrate as deeply into the sediments as our samplers (4 cm maximum depth for microelectrodes, 7.5-10 cm depth for pore water samplers), and so the microelectrode recorded consistently higher DO concentrations than our samplers. Although there were absolute differences between the methods, there was a significant relationship between the two methods (simple linear regression, $r^2=0.58$), indicating that the patterns we observed were consistent.

During the DO plateau, we also collected a pore water sample for water chemistry by holding a 30 mL, acid-washed, polypropylene bottle at the outlet from the calibration cup. We rinsed it once with pore water before filling it, capping it, and placing it on ice for transport to the laboratory. We placed them in the freezer until analysis.

Sediment Sampling

At each site, every two weeks, we also sampled sediments for organic matter content and sediment-bound NH_4^+ . We used an 8 cm PVC corer, and took 10 replicate samples at each site (depth = 7 cm), storing replicates in individual plastic cups, on ice, for transport to the laboratory. We processed the sediment samples the next day, by homogenizing each sample, and removing 5 mL for determination of sediment organic matter content. Next, we extracted sediment-bound NH_4^+ with 2 M potassium chloride (KCl): we weighed out 15-20 g of sediment into a centrifuge tube, added 2 M KCl in a 1:1 mass:volume ratio, and centrifuged them at 3000 RPM for 12 minutes. After allowing them to sit for 30 minutes, we filtered the supernatant and froze it until analysis (Caffrey and Kemp 1992).

To examine the fine-scale vertical distribution of pore water NH_4^+ and NO_3^- within the sediments, we deployed multi-chambered equilibrium dialysis samplers, or peepers, at all the sites in 2010 (Hesslein 1976; Teasdale et al. 1995). Deployment details are in the Supplemental Materials.

Whitlock-Vibert samplers

We estimated interstitial sedimentation rates with modified Whitlock-Vibert (W-V) samplers, which were originally developed to rear salmonid fry (International Federation of Fly Fishers, Livingston, MT). We removed the egg case from each sampler and covered the bottom with duct tape, to prevent sediment from falling through the bottom (Österling et al. 2008; Österling et al. 2010). With this design, fine sediments can still escape through the sides, which may result in an underestimate of interstitial sedimentation, but the method still allows for unbiased cross-site comparisons. We then filled them with clean landscape gravel, and measured the volume of substrate in each sampler via water displacement.

At each site, we deployed 10 W-V samplers, so that the top of each sampler was flush with the sediment-water interface, and we left them in place over the entire sampling season (i.e., June – September). At the end of the season, we gently removed each sampler and immediately placed it in a sealed plastic bag. Upon return to the laboratory, we opened each sampler and placed the contents into a large bowl, rinsing with deionized water to remove all particles. We removed all landscape gravel, which we readily identified by its large size and angular shape. We dry-sieved the accumulated sediments into 4 size classes: > 2 mm, 1-2 mm, 0.5-1 mm, and < 0.5 mm, and we measured the volume of each size class via water displacement. We then quantified the dry mass (DM) of each size class after drying for > 1 week at 40°C, and measured

organic matter content as loss on ignition (4 hours at 500° C). Finally, we calculated a sediment accumulation rate in two ways: 1) by dividing the weight of sediment accumulated by days deployed (units: g DM/d), and 2) by dividing the volume of sediment accumulated by days deployed (units: mL/day). We also calculated the percent of available pore space filled in the W-V sampler. In addition, in 2010, we took ambient soil cores next to each W-V sampler (n=10 per site at 9 cm depth) for comparison. We analyzed the ambient cores in the same way as the samplers; we measured the dry mass, ash-free dry mass (AFDM), and volume of each sediment size class found in the cores.

Groundwater measurements

To determine the hydraulic gradient and hydraulic conductivity of each site, we constructed 20 mini-piezometers out of 1.3 cm diameter (0.5”) PVC pipe. Each piezometer was 1.4 m long and was perforated along the bottom 15 cm (Dahm et al. 2006). Prior to deployment, we placed a rubber stopper in the bottom, and then we pounded them into the sediment by placing each piezometer inside an aluminum casing and driving it in with a fence post driver to 25-40 cm depth. To ensure a connection with the sub-surface water post-deployment, we removed all water in the piezometer by drawing it up into a syringe with a long piece of attached tubing and then we allowed the piezometer to refill with water before making our measurements.

All groundwater measurements were made during the last three weeks of July. To measure the vertical hydraulic gradient (VHG), we first measured ΔL , which is the length of the piezometer deployed below the sediments, but above the perforations. Next, we measured ΔH , which is the distance between the water level in the piezometer and the water level of the stream. We calculated VHG as ΔH divided by ΔL ; a positive VHG indicates upwelling, whereas a

negative VHG indicates downwelling (Dahm et al. 2006). After measuring VHG, we took a water sample for laboratory analysis of NH_4^+ and NH_3 . We also took a sample for the in situ measurement of DO, T, and pH, which we placed directly in the calibration cup of a Hydrolab minisonde and recorded the readings. When possible, we also measured hydraulic conductivity (K_h) by adding a slug of surface water to the top of the piezometer, and then recorded the water level every 10 seconds after slug addition until the water had reached its original level. We calculated K_h as described by Hvorslev (1951).

Water chemistry

In the laboratory, we analyzed all the surface water, pore water, groundwater, peeper, and KCl-extracted samples for NH_4^+ with the phenol-hypochlorite method (Solorzano 1969) on a Lachat QC-8500 (Hach, Loveland, CO). We then calculated the amount of NH_4^+ present in the field as NH_3 , based on the field measurements of pH and temperature (Emerson et al. 1975).

Statistical analysis

We analyzed the data with a regression approach, designating CS rank as the predictor variable. For other variables that were collected multiple times each year (pore water DO, pore water and sediment-bound NH_3 , and sediment organic matter content), we completed the regressions on each individual date because there was temporal auto-correlation in the data sets, even when date was included in the regression model (Zuur et al. 2009). This approach also allowed us to identify the specific time periods when DO or NH_3 were potentially stressful. We repeated this analysis with total mussel rank as the predictor variable, to determine if pore water

conditions limited recruitment of other mussel species. We used simple linear regression (SLR) to examine relationships between predictor variables.

We also explored the frequency with which toxic thresholds of NH_3 and DO were exceeded. We counted the dates on which OCS and CS sites exceeded previously established thresholds for other species (DO stress in juveniles: Sparks and Strayer 1998, DO stress in adults: Lewis 1984, NH_3 stress in juveniles: Newton and Bartsch 2007) and did a chi-square analysis to determine if thresholds were exceeded more frequently at OCS sites. Finally, we used a paired t-test to test for differences in pore water NH_4^+ and NH_3 with depth, from the peeper samples. For all analyses, we log-transformed or rank-transformed variables that did not meet assumptions of a normal distribution and homogeneous variances (Iman and Conover 1979). All statistical tests were completed in SYSTAT 12 (SYSTAT Software 2007) or R (R Core Team 2014, version 3.1.2).

Datasets

All pore water, sedimentation data, sediment size class, and sediment-bound chemistry data have been supplied as supplemental materials.

Results

Direct stressors – dissolved oxygen

In 2009, pore water DO did not vary with CS rank, but in 2010, pore water DO declined with CS rank (i.e., lower DO at OCS sites) on two sample dates (Fig. 2, SLR, $r^2=0.22$, $p=0.02$, and $F_{1,23}=6.5$; $r^2=0.19$, $p=0.03$, and $F_{1,23}=6.5$, respectively). The pattern was evident on other dates, as well, but one site (OCS1, rank 6) diverged from the general pattern, resulting in a non-significant regression on most dates. In addition, the OCS sites had more frequent occurrences of DO dropping below the threshold for juvenile death in *Elliptio complanata* (1.3 mg/L, Sparks

and Strayer 1998). More specifically, in 2010, OCS sites had DO concentrations that were non-lethal for juveniles on only two dates at just only one site (Table 2). DO concentrations crossed the lethal threshold for juveniles in CS sites, as well, but these occurrences were less frequent (chi-square, $p = 0.08$). Both OCS and CS sites were beneath the threshold for adult DO stress (1 mg/L, Lewis 1984) throughout 2010, with no difference in the frequency of adult DO stress occurrence (chi-square, $p > 0.1$, Table 2). In 2009, pore water DO occasionally dropped beneath the juvenile death and adult stress thresholds, but did so with the same frequency at both OCS and CS sites (chi-square, $p > 0.3$ for both adult stress and juvenile lethality).

Similarly, groundwater DO, sampled from piezometers, declined with CS rank (SLR, $r^2 = 0.634$, $p = 0.058$, Fig. 3). Overall, sub-surface DO concentrations were lower and more likely to be at stressful levels at OCS sites compared to CS sites.

Direct stressors – ammonia

We measured NH_4^+ and NH_3 concentrations in surface water, pore water, and groundwater, bound to sediments, and in peepers. In 2009, pore water NH_3 unexpectedly declined with CS rank, with more NH_3 at the CS sites ($r^2=0.42$, $F_{1,26}=18.9$; $r^2=0.63$, $F_{1,25}=43$; $r^2=0.54$, $F_{1,23}=27.4$; $r^2=0.55$, $F_{1,25}=30.6$, respectively, all $p < 0.0001$, Fig. 4). Further investigation revealed that this difference was due to patterns in pH, rather in NH_4^+ concentrations. There was no relationship between site rank and NH_4^+ concentration (Supplemental Fig. 1), but pH declined with site rank such that more of the NH_4^+ at CS sites was present as NH_3 . In contrast, the sediment-bound NH_3 concentrations increased with CS rank (more NH_3 at the OCS sites) on 3 dates ($r^2=0.09$, $p=0.02$, $F_{1,58}=5.8$; $r^2=0.14$, $p=0.004$, $F_{1,58}=9.2$; $r^2=0.13$, $p=0.01$, $F_{1,58}=6.6$, respectively, Fig. 5). The patterns in sediment-bound NH_4^+ concentrations mirrored the sediment-bound NH_3 concentrations, indicating that the patterns observed in NH_3 were a result

of more sediment-bound NH_4^+ availability at OCS sites, rather than higher pH (Supplemental Fig. 2). The overall effect of NH_3 is inconsistent: on some dates, we observed greater NH_4^+ availability in the non-clubshell sites, but pH mediates the toxicity of NH_4^+ , such that NH_3 sometimes increased and sometimes decreased with CS rank.

Instead, NH_3 stress appears to occur occasionally and at all sites equally. Pore water and surface water NH_3 concentrations did not exceed toxicity thresholds ($29.8 \mu\text{g NH}_3\text{-N/L}$ EC50 for sediment exposures to juveniles, $124 \mu\text{g N/L}$ for juvenile death, Newton and Bartsch 2007) at any time or place. Sediment-bound NH_3 was generally higher than surface water, pore water, or ground water, and it did exceed toxic thresholds at times. In 2009, there were 3 occurrences of sediment-bound NH_3 exceeding the juvenile EC50, and this occurred solely at OCS sites. In 2010, sediment-bound NH_3 concentrations reached toxic levels more frequently, with 4 sites having levels above the juvenile EC50 at least once; these included one OCS site (OCS 2, exceeded on 6 of 8 dates), and a CS site (CS 3, exceeded on 4 of 8 dates). Ammonia concentrations reached juvenile lethal levels at one OCS site (OCS 2) in early August 2010.

Peeper NH_4^+ and NH_3 concentrations generally increased with depth into the sediment, but there was no difference between OCS and CS sites for either NH_4^+ or NH_3 (paired t-test, $p > 0.1$ for both analytes). Ammonia concentrations reached the juvenile EC50 at 3 sites (CS 1, OCS 1, and CS 2), but in all three cases, potentially toxic levels occurred at 15 cm depth into the sediment, which is probably deeper than clubshell and juvenile mussels typically bury (Yeager et al. 1994, Watters 2007).

Indirect stressors – sedimentation rate

The interstitial sedimentation rate, expressed as the percent of pore space filled, increased with CS rank (i.e., more sedimentation at OCS sites) in 2010 (SLR, $r^2=0.22$, $p<0.001$, $F_{1,56}=15.6$,

Fig. 6). In 2009, we observed the opposite relationship, with the sedimentation rate decreasing with CS rank (SLR, $r^2=0.10$, $p=0.014$, $F_{1,56}=6.5$, Fig. 6). However, this relationship had low explanatory power and was driven entirely by an anomalous result at Site 0CS1, which had the lowest sedimentation rate, but also the lowest mussel population. With 0CS1 removed, there was no significant relationship between CS rank and sedimentation rate in 2009.

Sediment size class distribution data showed that 0CS sites generally had more fine sediments (<0.5 mm: SLR, $r^2=0.07$, $p=0.04$, $F_{1,58}=4.4$ and 0.5-1 mm: SLR, $r^2=0.24$, $p<0.0001$, $F_{1,58}=18.1$) and fewer large sediments (>2mm: $r^2=0.12$, $p=0.0067$, $F_{1,58}=7.9$, Fig. 7), with no difference in medium-sized sediments (1-2 mm: $r^2=0.007$, $p=0.52$). Thus, although there was inter-annual variation in measured sedimentation rates, more fine sediments were present at sites with lower mussel populations.

Indirect stressors – sediment organic matter content

We measured sediment organic matter (OM) content in numerous samples: 1) the material that filled the W-V samplers (hereafter referred to as “sedimented” material), 2) in bi-weekly sediment samples, and 3) in the samples collected for sediment size class analysis. In our bi-weekly and size class samples, we found no relationship between CS rank and OM content on any date or for any of the size classes. In contrast, the sedimented material from the W-V samplers did exhibit significant patterns, with OM increasing with CS rank in 2009 (SLR, OM percent = $1.13+0.13*\text{rank}$, $r^2=0.12$, $p=0.007$, $F_{1,56}=7.8$) and decreasing with CS rank in 2010 (SLR, OM percent = $2.62-1.4*\text{rank}$, $r^2=0.35$, $p<0.0001$, $F_{1,56}=28.2$). Overall, relationships with sediment OM content are inconsistent among years and do not appear to have an influence on the overall OM content of each site.

Effect of potential stressors on total mussel population

We also examined the data by total mussel rank, and found few statistically significant patterns. On one date (10/1/2009), pore water DO generally increased with total mussel rank (more DO at sites with fewer mussels), but DO concentrations were high at all sites and above stress thresholds. In 2009, the OM content of sedimented material increased with total mussel rank (more OM at sites with fewer mussels). Sediment-bound NH_3 and NH_4^+ did not increase or decrease with total mussel rank on any date. The percent of sediment in the 0.5-1mm range generally decreased with total mussel rank, but there was no relationship between total mussel rank and percent of sediments in any of the other size classes.

Linking direct and indirect stressors

We examined interactions among our measured variables, in order to explore potential causes of direct stressors. We found some evidence for linkages among direct and indirect stressors; specifically, pore water DO decreased with increasing sediment OM content in both 2009 and 2010 (SLR, $r^2 = 0.247$, $p < 0.04$ in 2009; $r^2 = 0.118$, $p < 0.05$ in 2010; Supplemental Fig 3A and B), likely as a result of the consumption of DO during OM decomposition. Additionally, sediment-bound NH_4^+ concentrations increased with sediment OM content in both years (SLR, $r^2 = 0.162$, $p < 0.001$ in 2009; $r^2 = 0.155$, $p < 0.001$ in 2010; Supplemental Fig. 3C and D), likely resulting from the mineralization of NH_4^+ during OM decomposition. Finally, pore water DO decreased as pore water NH_4^+ increased (SLR, $r^2 = 0.192$, $p < 0.001$ in 2009; $r^2 = 0.426$, $p < 0.001$ in 2010, Supplemental Fig. 3E and F), possibly reflecting DO consumption during the release of NH_4^+ (mineralization).

Groundwater movement

Groundwater movement can potentially influence mussels via delivery of oxygen, food, and other materials (Dahm et al. 2006). We found that all of our sites, except OCS 3, were

primarily groundwater upwelling sites; that is, these sites had a positive VHG. At OCS 3, the VHG was positive in about half of the piezometers, and negative in the other half, resulting in a mean VHG of 0. At OCS sites, mean VHG was 0.03 ± 0.02 SE, while at CS sites, the mean VHG was 0.05 ± 0.001 SE, resulting in no significant patterns by CS rank or between CS and OCS sites. Hydraulic conductivity averaged 0.01 ± 0.001 cm/s at OCS sites and 0.01 ± 0.004 cm/s at CS sites and also did not exhibit patterns by CS rank or by CS presence or absence. We thus conclude that clubshell presently and historically inhabited groundwater upwelling sites.

Discussion

We completed a two-year study, in which we compared physicochemical conditions at sites where clubshell mussels are absent (or below our sampling detection limit) and sites where they remain extant. Our focus was on quantifying pore-water conditions, where adult clubshell and juveniles of most species dwell (Yeager et al. 1994; Watters 2007). We found that pore water DO concentrations declined with CS rank in mid-summer, and that they fell below stress thresholds more often at OCS sites, which suggests that DO may be limiting at these sites. Also, sediment size was smaller and interstitial sedimentation rates were higher at OCS sites; thus, low DO may be the result of elevated sedimentation rates reducing exchange with the surface water.

Ideally, we would have tested our hypotheses more definitively by conducting experiments directly on the clubshell, either in the laboratory, or by transplanting specimens to sites that spanned a range of physicochemical conditions. Unfortunately, in doing so, we would risk the destruction of these endangered species. Instead, we used a comparative approach, which nonetheless provided some evidence that clubshell are limited by pore water oxygen and interstitial sedimentation.

376

377 *Potential stressor – low dissolved oxygen*

378 We found that pore water and groundwater DO was lower at OCS sites, especially during
379 mid-summer. In addition, OCS sites had more frequent occurrences of stressful conditions (Table
380 2, Fig. 2). Tolerance for low DO varies among freshwater mussel species, with the most tolerant
381 species generally occurring in lentic or other low-oxygen habitats (Chen et al. 2001; McMahon
382 and Bogan 2001). Although DO thresholds have not been examined specifically for the
383 clubshell, its sub-surface habitat may suggest that it can tolerate lower DO concentrations. We
384 measured pore water DO below the lowest tolerance threshold identified for adult freshwater
385 mussels (1 mg/L, Lewis 1984), which either suggests that DO is limiting for clubshell or that it is
386 especially tolerant of low DO conditions. Some adult mussels can tolerate anoxia simply by
387 closing their shells (McMahon and Bogan 2001), but a closed shell limits ion and gas exchange,
388 along with feeding and reproduction. In addition, even if the adult clubshell are unaffected,
389 juveniles are typically less tolerant of low DO (Dimock and Wright 1993; Sparks and Strayer
390 1998), which can limit subsequent recruitment. Our results suggest that conditions were limiting
391 for juveniles at all sites, including sites with apparent clubshell reproduction, during at least part
392 of the year.

393 We found that pore water DO concentrations were weakly, and negatively, correlated
394 with sediment organic matter content, likely as a result of DO consumption during microbial
395 decomposition. Sediment organic matter content was not consistently higher at the OCS sites.
396 Indeed, it was sometimes lower than at the CS sites, so this likely does not explain the decline in
397 DO with CS rank. Pore water DO can also be reduced by interstitial sedimentation, because the
398 fine sediments inhibit exchange with the overlying surface water (Brunke and Gonser 1997;

Wood and Armitage 1997). We observed higher sedimentation rates and smaller sediment grain size at the OCS sites in 2010. As a result, we conclude that patterns in pore water DO are likely linked to physical barriers (sedimentation) rather than DO consumption.

Potential stressor – ammonia

In addition to blocking pore spaces, interstitial sedimentation can increase NH_4^+ and NH_3 concentrations, by allowing NH_4^+ to accumulate, instead of diffusing to the overlying surface water, or by increasing the surface area of particles which bind NH_4^+ (Triska et al. 1993; Brunke and Gonser 1997). We measured NH_4^+ and NH_3 in the pore water, surface water, and groundwater, bound to sediments, and in peepers, and found inconsistent trends in NH_3 ; sometimes, pore water NH_3 increased with CS rank, and other times, it decreased with CS rank. The inconsistencies are partially due to the mediating influence of pH; NH_4^+ concentrations either exhibited no difference among sites or there was more NH_4^+ at OCS sites, but pH varied such that differential amounts of NH_4^+ were present as NH_3 .

Similarly, both CS and OCS sites occasionally exceeded the EC50 for NH_3 in juveniles (Newton and Bartsch 2007), and one OCS site (OCS2, site rank 5) exceeded the juvenile lethal level on one date. Moreover, there is evidence that laboratory tests may overestimate chronic NH_3 toxicity levels. Strayer and Malcolm (2012) observed a decline in juvenile recruitment at levels as low as 2 $\mu\text{g NH}_3\text{-N/L}$, which is much lower than the previously-identified threshold of 29.8 $\mu\text{g NH}_3\text{-N/L}$ (Newton and Bartsch 2007). We measured NH_3 concentrations $>2 \mu\text{g/L}$ in 4 of 6 sites (2 CS and 2 OCS sites), over the entire sampling season in both 2009 and 2010. In 2010, all sites had an average NH_3 concentration of $> 2 \mu\text{g/L}$ on at least one sampling date. Thus, there is the potential for NH_3 stress at several sites, although this potential stress seems unrelated to clubshell presence or absence.

Sediment OM content was weakly correlated with NH_4^+ concentrations, suggesting that the source of NH_4^+ was mineralization during microbial decomposition. However, sediment OM content did not vary consistently among sites, suggesting that differences in NH_4^+ , when they occurred, were driven by differences in mineralization rates or by physical barriers to NH_4^+ diffusion, rather than by differences in OM standing stocks.

We hypothesized that water column nutrient loads would also negatively influence mussels, either by being a source of NH_4^+ to the subsurface sediments, or by fueling algal blooms, which die and decompose, removing DO from the sediment-water interface and interstices. We found no difference in surface water NH_4^+ or NH_3 , or in sediment organic matter content, which would potentially increase with the addition of senescent algae. Notably, most sites were groundwater upwelling sites (i.e., exhibiting a positive VH), which suggests that surface water nutrients may have had less of a direct influence on pore water conditions, compared to downwelling sites.

Spatial and temporal variation

One challenge with inferring stressors from a multi-site comparison is in discerning patterns in a system that varies in space and through time. At our study sites, this variation included spatial differences in the particular stressors that influenced a particular site. For example, site OCS1 (site rank 6) had no live mussels at all when surveyed in 2008. But it had consistently higher DO and lower NH_3 than the other OCS sites. In fact, if we eliminated Site OCS 1 from our analyses, DO would have significantly decreased with CS rank on most dates. When we re-surveyed the site in 2010, it still had the fewest total live mussels, but we found 5 different mussel species, suggesting that the mussel population was destroyed in an episodic event and is now rebounding, rather than being limited by chronic low DO.

In addition, our results revealed strong inter-annual variation in DO, NH_4^+ , and NH_3 concentrations. The cool, wet conditions of 2009 obscured the site differences and low pore water DO concentrations that we observed in 2010. Similarly, pore water NH_4^+ and NH_3 were lower in 2009, when river discharge was higher, possibly reflecting increased flushing and dilution in the pore spaces during high-water conditions. These temporal patterns illustrate the importance of multi-year assessments, especially when considering long-lived species; a single year of study may not adequately characterize the conditions experienced over the lifetime of the clubshell.

Other mussel species

Our analysis of the data by total mussel population showed little evidence that pore water conditions negatively influenced the total number of freshwater mussels present at a site. We expected that clubshell are the only species strongly influenced by pore water as adults, but juveniles of most species are typically buried, so unsuitable pore water conditions can lead to low recruitment. It may be that the pore water conditions negatively affecting clubshell have not been present long enough for recruitment to decrease the populations of other species, given their longevity.

Other potential stressors

Although we did find some evidence of lower DO and higher interstitial sedimentation rates at OCS sites, DO stress likely does not fully explain clubshell declines. It is important to recognize that even our CS sites represent only partial remnants of the historical population. These sites are a patchwork of clubshell decline, with all sites experiencing some stressors, with stronger effects in some places along the Tippecanoe River. It is likely that the CS sites have marginal habitat and that other, unmeasured stressors are also contributing to clubshell declines

at the OCS sites. In addition to the stressors we measured, freshwater mussels generally face threats from reductions in fish host availability, the recruitment limitations of small mussel populations, and toxicity from other, unmeasured pollutants (Downing et al. 2010). In the case of the clubshell, we do not expect that fish hosts are limiting; all four of the identified clubshell host species (O'Dee and Watters 2000) are present in the Tippecanoe River (USFWS 1998). The low clubshell population size may limit reproduction, however; lower densities decrease the probability that females will acquire sperm, and small glochidial densities also reduce the probability of finding a suitable host (Downing et al. 2010). In addition, several pollutants have been identified as toxic to mussels, including pesticides (Bringolf et al. 2007) and heavy metals (Cope et al. 2008). Given the intensive agricultural land use (>85% row crop agriculture) in the surrounding watershed, pesticides are likely present in the Tippecanoe River, although we do not know if they are present at toxic concentrations, and this aspect is deserving of further study.

In addition, exploring other stressors may help identify threats to clubshell, including continuous turbidity measurements (Österling et al. 2008; Österling et al. 2010), which could identify episodic sedimentation events, and perhaps help explain the inter-annual variability in interstitial sedimentation rates. In general, more field measurements of pore water NH_3 and DO are warranted, which would parameterize the range of conditions present in the field, and further inform laboratory experiments. In addition, further investigation into the effects of stressor combinations will be necessary; for instance, low DO can exacerbate mussel NH_3 stress (Cooper et al. 2005). Thus far, pore water DO has been measured in association with hyporheic invertebrate communities (e.g., Strayer et al. 1997; Franken et al. 2001; Hunt and Stanley 2003) and salmon redds (Heywood and Walling 2007), but pore water DO has been less frequently measured for studies of mussel habitat suitability (but see Buddensiek et al. 1993). Our results

from the Tippecanoe River clubshell are somewhat surprising in that clubshell were present even when pore water DO dropped below 1 mg/L, and when NH_3 concentrations were as high as 37 $\mu\text{g N/L}$. More measurements would help determine the range of DO conditions experienced by clubshell and juvenile mussels, and aid in the interpretation of laboratory stress tests with varying DO.

Management of mussel habitat: lessons from the Tippecanoe River

Because juvenile mussels inhabit sub-surface sediments, characterization of pore water conditions is important to both understanding mussel declines and for promoting mussel recovery. Our work on the Tippecanoe River illustrated some of the methodological and interpretive challenges associated with pore water measurements, including the incorporation of inter-annual variation, site heterogeneity, and episodic events into a sampling regime. In addition, the lack of previous pore water measurements makes it somewhat challenging to place our results in context. Nevertheless, our results do provide some insights into the variation in pore water conditions among sites, and we provide some evidence for interstitial sedimentation and resultant DO stress. In addition, we add a comprehensive pore water data set to the literature, which will be useful for future comparisons.

Sedimentation is a common resource concern, especially in agricultural landscapes (Blann et al. 2009). The Tippecanoe River is somewhat buffered from excess sedimentation, because of its relatively intact, forested floodplain (Tockner et al. 1999) and the glacial lakes and reservoirs in the surrounding watershed (Homoya et al. 1985), which can serve as sediment traps and nitrogen removal zones (Wall et al. 2005). Indeed, the Tippecanoe is not obviously impaired by sediment, with the river bottom is mostly comprised of gravel and cobble. But the Tippecanoe does receive sediment loading from incised agricultural tributaries and drainage ditches, and

sedimentation of pore spaces appears to be problematic here based on our results. Interstitial sedimentation may limit mussels even in rivers where excess sediment is not obvious.

Overall, we recommend that conservation efforts in the Tippecanoe River address erosion and other sources of sediment input into the Tippecanoe River. More broadly, we recommend that future studies on freshwater mussels include characterization of pore water conditions, in order to better assess habitat suitability for juveniles.

Acknowledgements

Brant Fisher of the Indiana Department of Natural Resources led the clubshell field surveys and provided clubshell population data. Allison M. Truhlar was instrumental in obtaining the groundwater measurements and collecting other field and lab data. Melody Kemp provided the microelectrodes. Dave Strayer, David Lodge, Brant Fisher, two anonymous reviewers, and an Associate Editor provided valuable insights that improved this manuscript. Paul and BethAnn Hollar, Matthew and Betty Reichard, and other landowners provided access to the river. This research was funded by the Center for Aquatic Conservation/Environmental Change Initiative at the University of Notre Dame and a Student Conservation Award from the Society for Freshwater Science. S.S. Roley was funded by the Arthur J. Schmitt Foundation at the University of Notre Dame and by GLOBES, NSF-IGERT DGE 0504495.

536 **Literature Cited**

- 537 Allan, J. D. 2004. Landscapes and riverscapes: the influence of land use on stream ecosystems.
538 *Annu. Rev. Ecol. Evol. Syst.* **35**: 257-284.
- 539 Augspurger, T., Keller, A. E., Black, M.C., Cope, W.G., and Dwyer, F. J. 2003. Water quality
540 guidance for protection of freshwater mussels (Unionidae) from ammonia exposure. *Environ.*
541 *Toxicol. Chem.* **22**: 2569-2575.
- 542 Blann, K.L., Anderson, J.L., Sands, G.R., and Vondracek, B. 2009. Effects of agricultural
543 drainage on aquatic ecosystems: a review. *Crit. Rev. Environ. Sci. Tech.* **39**: 909-1001.
- 544 Braun, A., Auerswald, K., and Geist, J. 2012. Drivers and spatio-temporal extent of hyporheic
545 patch variation: Implications for sampling. *PLOS One*. B: e42046.
- 546 Bringolf, R. B., Cope, W.G., Eads, C.B., Lazaro, P.R., Barnhart, M.C., and Shea, D. 2007. Acute
547 and chronic toxicity of technical-grade pesticides to glochidia and juveniles of freshwater
548 mussels (Unionidae). *Environ. Toxicol. Chem.* **26**: 2086-2093.
- 549 Brunke, M., and Gonser, T. 1997. The ecological significance of exchange processes between
550 rivers and groundwater. *Freshw. Biol.* **37**: 1-33.
- 551 Buddensiek, V., Engel, H. Fleischauerrossing, S., and Wachtler, K. 1993. Studies on the
552 chemistry of interstitial water taken from defined horizons in the fine sediments of bivalve
553 habitats in several northern German lowland waters 2. Microhabitats of *Margaritifera*-
554 *Margaritifera* L, *Unio-Crassus* (Philipsson) and *Unio-Tumidus* Philipsson. *Archiv Fur*
555 *Hydrobiologie* **127**: 151-166.

- 556 Caffrey, J.M. and Kemp, W.M.. 1992. Influence of the submersed plant, *Potamogeton*
557 *perfoliatus*, on nitrogen cycling in estuarine sediments. Limnology and Oceanography.
558 **37**:1483-1495.
- 559 Chen, L. Y., Heath, A.G., and Neves, R. J. 2001. Comparison of oxygen consumption in
560 freshwater mussels (Unionidae) from different habitats during declining dissolved oxygen
561 concentration. Hydrobiologia **450**: 209-214.
- 562 Cooper, N. L., Bidwell, J. R. and Cherry, D.S. 2005. Potential effects of Asian clam (*Corbicula*
563 *fluminea*) die-offs on native freshwater mussels (Unionidae) II: porewater ammonia. J. N. Am.
564 Benthol. Soc. **24**: 381-394.
- 565 Cope, W. G., Bringolf, R.B., Buchwalter, D.B., Newton, T.J., Ingersoll, C.G., Wang, N.,
566 Augspurger, T., Dwyer, F.J., Barnhart, M.C., Neves, R.J., and Hammer, E. 2008. Differential
567 exposure, duration, and sensitivity of unionoidean bivalve life stages to environmental
568 contaminants. J. N. Am. Benthol. Soc. **27**: 451-462.
- 569 Cummings, K.S., Mayer, C.A., Page, L.M., and Berlocher, J.M.K. 1987. Survey of the
570 Freshwater mussels (Mollusca:Unionidae) of the Wabash River Drainage Phase I: Lower
571 Wabash and Tippecanoe Rivers. Illinois Natural History Survey. 60 pp.
- 572 Dahm, C.N., Valett, H.M. Baxter, C.V., and Woessner, W.W. 2006. Hyporheic zones. In
573 Methods in stream ecology, 2nd edition. Edited by F. R. Hauer and G. L. Lamberti. Academic
574 Press, Burlington, Mass. pp 119-142.
- 575 Dimock, R.V. and Wright, A.H. 1993. Sensitivity of juvenile freshwater mussels to hypoxic,
576 thermal, and acid stress. Journal of the Elisha Mitchell Scientific Society **109**: 183-192.

- 577 Dodds, W.K. 2002. Freshwater ecology: Concepts and environmental applications. Academic
578 Press, San Diego, Calif.
- 579 Downing, J. A., Van Meter, P., and Woolnough, D.A.. 2010. Suspects and evidence: a review of
580 the causes of extirpation and decline in freshwater mussels. Animal Biodiversity and
581 Conservation **33**: 151-185.
- 582 Emerson, K., Russo, R.C., Lund, R.E. and Thurston, R.V. 1975. Aqueous ammonia equilibrium
583 calculations - effect of ph and temperature. Journal of the Fisheries Research Board of Canada
584 **32**: 2379-2383.
- 585 ESI [Ecological Specialists, Inc.]. 1993. Mussel habitat suitability and impact analysis of the
586 Tippecanoe River. Final Report to the Indiana Department of Natural Resources, 102 pp.
- 587 Franken, R.J.M., Storey, R.G., and Williams, D.D. 2001. Biological, chemical and physical
588 characteristics of downwelling and upwelling zones in the hyporheic zone of a north-temperate
589 stream. Hydrobiologia **444**: 183-195.
- 590 Geist, J., Auerswald, K. 2007. Physicochemical stream bed characteristics and recruitment of the
591 freshwater pearl mussel (*Margaritifera margaritifera*). Freshwater Biology. **52**: 2299-2316.
592 doi:10.1111/j.1365-2427.2007.01812.x
- 593 Hesslein, R. H. 1976. In situ sampler for close interval pore water studies. Limnology and
594 Oceanography **21**: 912-914.
- 595 Heywood, M.J.T. and Walling, D.E. 2007. The sedimentation of salmonid spawning gravels in
596 the Hampshire Avon catchment, UK: implications for the dissolved oxygen content of
597 intragravel water and embryo survival. Hydrological Processes **21**: 770-788.

- 598 Homoya, M.A., Abrell, D.B. Aldrich, J.R., and Post, T.W. 1985. The natural regions of Indiana.
599 Proceedings of the Indiana Academy of Sciences **94**: 245-268.
- 600 Hunt, G.W. and Stanley, E.H. 2003. Environmental factors influencing the composition and
601 distribution of the hyporheic fauna in Oklahoma streams: Variation across ecoregions. Archiv
602 Fur Hydrobiologie **158**: 1-23.
- 603 Hvorslev, M. J. 1951. Time lag and soil permeability in ground-water observations. U.S. Corps
604 of Engineers, Waterways Experiment Station.
- 605 IDNR [Indiana Department of Natural Resources]. 2006. Unionid surveys of the East Fork White
606 River, the Tippecanoe River, and the Wabash River, Indianapolis, IN.
- 607 Iman, R.L., and Conover, W.J. 1979. The use of the rank transform in regression.
608 Technometrics **21**: 499-509.
- 609 Kemp, M.J., and Dodds, W.K. 2001. Centimeter-scale patterns in dissolved oxygen and
610 nitrification rates in a prairie stream. J. N. Am. Benthol. Soc. **20**: 347-357.
- 611 Lewis, J. B. 1984. Comparative respiration in two species of freshwater unionid mussels
612 (Bivalvia). Malacological Review **17**: 101-102.
- 613 Lydeard, C., Cowie, R.H., Ponder, W.F., Bogan, A.E., Bouchet, P., Clark, S.A., Cummings,
614 K.S., Frest, T.J., Gargominy, O., Herbert, D.G., Hershler, R., Perez, K.E., Roth, B., Seddon, M.,
615 Strong, E.E., and Thompson, F.G. 2004. The global decline of nonmarine mollusks. Bioscience
616 **54**: 321-330.
- 617 McMahon, R. F. and Bogan, A. E. 2001. Mollusca: Bivalvia, *In* Ecology and Classification of
618 North American Freshwater Invertebrates. *Edited by* J. H. Thorp and A. P. Covich. Academic
619 Press, San Diego, Calif. pp. 331-430.

- 620 Mummert, A. K., Neves, R. J., Newcomb, T. J., and Cherry, D.S. 2003. Sensitivity of juvenile
621 freshwater mussels (*Lampsilis fasciola*, *Villosa iris*) to total and un-ionized ammonia. Environ.
622 Toxicol. Chem. **22**: 2545-2553.
- 623 Myers-Kinzie, M. and Bright, G.. 2005. Bioassessment in the Tippecanoe River Watershed,
624 2003-2004. Final Report to The Nature Conservancy, 14 pp.
- 625 Newton, T.J. and Bartsch, M.R. 2007. Lethal and sublethal effects of ammonia to juvenile
626 *Lampsilis* mussels (Unionidae) in sediment and water-only exposures. Environ. Toxicol. Chem.
627 **26**: 2057-2065.
- 628 O'Dee, S. H., and Watters, G.T. 2000. New or confirmed host identifications for ten freshwater
629 mussels. Proceedings of the Conservation, Captive Care, and Propagation of Freshwater Mussels
630 Symposium 1998: 77-82.
- 631 Österling, E. M., Greenberg, L. A. and Arvidsson, B. L. 2008. Relationship of biotic and abiotic
632 factors to recruitment patterns in *Margaritifera margaritifera*. Biological Conservation **141**:
633 1365-1370.
- 634 Österling, M. E., Arvidsson, B. L., and Greenberg, L. A. 2010. Habitat degradation and the
635 decline of the threatened mussel *Margaritifera margaritifera*: influence of turbidity and
636 sedimentation on the mussel and its host. J. Appl. Ecol. **47**: 759-768.
- 637 Owen, C.T., McGregor, M.A., Cobbs, G.A., and Alexander, J.E. 2011. Muskrat predation on a
638 diverse unionid mussel community: impacts of prey species composition, size and shape.
639 Freshw. Biol. **56**: 554-564.
- 640 Parmalee, P.W., and Bogan, A. E. 1998. The freshwater mussels of Tennessee. University of
641 Tennessee Press, Knoxville, TN.

- 642 R Core Team. 2014. R: A language and environment for statistical computing. R Foundation
643 for Statistical Computing, Vienna, Austria. <http://www.R-project.org/>.
- 644 Ricciardi, A. and Rasmussen, J.B. 1999. Extinction rates of North American freshwater fauna.
645 Conservation Biology **13**: 1220-1222.
- 646 Solorzano, L. 1969. Determination of Ammonia in Natural Waters by Phenolhypochlorite
647 Method. Limnology and Oceanography **14**: 799-801.
- 648 Sparks, B. L. and Strayer, D.L. 1998. Effects of low dissolved oxygen on juvenile *Elliptio*
649 *complanata* (Bivalvia : Unionidae). J. N. Am. Benthol. Soc. **17**: 129-134.
- 650 Strayer, D. L. 2006. Challenges for freshwater invertebrate conservation. J. N. Am. Benthol. Soc.
651 **25**: 271-287.
- 652 ---. 2008. Freshwater Mussel Ecology: A Multifactor Approach to Distribution and Abundance.
653 University of California Press.
- 654 Strayer, D. L., May, S. E., Nielsen, P., Wollheim, W., and Hausam, S. 1997. Oxygen, organic
655 matter, and sediment granulometry as controls on hyporheic animal communities. Archiv Fur
656 Hydrobiologie **140**: 131-144.
- 657 Strayer, D.L. and Malcolm, H.M.. 2012. Causes of recruitment failure in freshwater mussel
658 populations in southeastern New York. Ecological Applications **22**:1780-1790.
- 659 SYSTAT Software. 2007. SYSTAT. Version 12. SYSTAT Software, Chicago, Illinois, USA.
- 660 Teasdale, P. R., Batley, G. E., Apte, S. C., and Webster, I.T. 1995. Pore-water sampling with
661 sediment peepers. Trac-Trends in Analytical Chemistry **14**: 250-256.

- 662 Tockner, K., Pennetzdorfer, D., Reiner, N. Schiemer, F. and Ward, J.V. 1999. Hydrological
663 connectivity, and the exchange of organic matter and nutrients in a dynamic river-floodplain
664 system (Danube, Austria). *Freshw. Biol.* **41**: 521-535.
- 665 Triska, F.J., Duff, J.H. and Avanzino, R.J. 1993. The role of water exchange between a stream
666 channel and its hyporheic zone in nitrogen cycling at the terrestrial aquatic interface.
667 *Hydrobiologia* **251**: 167-184.
- 668 USFWS [United States Fish and Wildlife Service]. 1994. Clubshell (*Pleurobema clava*) and
669 Northern Riffleshell (*Epioblasma torulosa rangiana*) Recovery Plan, Hadley, MA.
670 [http://www.fwspubs.org/doi/suppl/10.3996/052013-JFWM-](http://www.fwspubs.org/doi/suppl/10.3996/052013-JFWM-033/suppl_file/patnodereference+s12.pdf)
671 [033/suppl_file/patnodereference+s12.pdf](http://www.fwspubs.org/doi/suppl/10.3996/052013-JFWM-033/suppl_file/patnodereference+s12.pdf)
- 672 ---. 1998. Tippecanoe River, Indiana: Defining point sources to rare and endangered mussels.
673 Bloomington, IN.
674 <http://ecos.fws.gov/ServCatFiles/reference/holding/21918?accessType=DOWNLOAD>
- 675 ---. 2009. Clubshell (*Pleurobema clava*) 5-year review: summary and evaluation. State College,
676 PA.
677 http://www.fws.gov/northeast/EcologicalServices/pdf/endangered/clubshell_5_year_review.pdf
- 678 Wall, L.G., Tank, J.L. Royer, T.V., and Bernot, M.J. 2005. Spatial and temporal variability in
679 sediment denitrification within an agriculturally influenced reservoir. *Biogeochemistry* **76**: 85-
680 111.
- 681 Watters, G.T. 2007. A brief look at freshwater mussel (Unionacea) biology. In Farris, J.L., Van
682 Hassel, J.H. (eds). *Freshwater bivalve ecotoxicology*. CRC Press, Boca Raton, FL.

- 683 Watters, G.T., Hoggarth, M.A., and Stansbery, D. H. 2009. The Freshwater Mussels of Ohio.
684 The Ohio State University Press, Columbus, OH.
- 685 Williams, J.D., Warren, M.L., Cummings, K.S., Harris, J.L., and Neves, R.J. 1993. Conservation
686 status of fresh-water mussels of the United-States and Canada. *Fisheries* **18**: 6-22.
- 687 Wood, P.J. and Armitage, P.D. 1997. Biological effects of fine sediment in the lotic
688 environment. *Environmental Management* **21**: 203-217.
- 689 Yeager, M.M., Cherry, D.S., and Neves, R.J. 1994. Feeding and burrowing behaviors of juvenile
690 rainbow mussels, *Villosa iris* (Bivalvia: Unionidae). *J. N. Am. Benthol. Soc.*, 13:217-222.
- 691 Zuur, A.F., Ieno, E.N., Walker, N.J., Saveliev, A.A., Smith, G.M. 2009. Mixed effects models
692 and extensions in ecology with R. Springer: New York, NY, USA.

Tables

Table 1. Sample sites, locations, and mussel populations, July 2008 and August 2010.

Site ^a	CS Rank ^b	Total Mussel Rank ^c	Clubshell (#)		Live native mussels (#) ^e		Native species ^f (#)		Search Time (min) ^g	
			2008	2010	2008	2010	2008	2010	2008	2010
CS 1	3	4	5	3	19	15	9	9	80	30
0CS 1	6	6	WD ^d	WD	0	11	0	5	120	120
0CS 2	5	5	WD	WD	13	26	5	8	120	120
CS 2	1	2	9	13	45	51	9	7	60	NT ^h
CS 3	2	1	9	6	230	65	10	8	120	NT
0CS 3	4	3	WD	1	89	89	10	9	120	120

- a. Sites are listed from upstream to downstream.
- b. Sites are ranked by number of clubshell present; a site rank of 1 corresponds to the most clubshell (i.e., the best site) and a site rank of 6 corresponds to the worst site (0 clubshell and fewest live mussels).
- c. The total mussel rank was determined by the number of live native mussels present per minute of searching.
- d. WD = weathered dead; old, weathered shells present.
- e. The total number of live, native mussels.
- f. The number of live native mussel species (excludes weathered dead and fresh dead specimens).
- g. Search time is the total person-minutes (number of people multiplied by minutes searched). Each survey was conducted with 2-4 people.
- h. NT= not timed; these were stratified random quadrat searches

Table 2. Pore water dissolved oxygen stress threshold frequencies.

Site	2009		2010		Total	
	Juvenile death ^a	Adult stress ^b	Juvenile death	Adult stress	Juvenile death	Adult stress
0CS1	0/3	0/3	3/5	2/5	3/8	2/8
0CS2	1/3	1/3	5/5	5/5	6/8	6/8
0CS3	2/3	2/3	5/5	5/5	7/8	7/8
CS1	0/3	0/3	4/5	4/5	4/8	4/8
CS2	2/3	1/3	1/5	1/5	3/8	2/8
CS3	1/3	0/3	4/5	4/5	5/8	4/8

a. Juvenile death is defined as mean pore water DO for the site < 1.3 mg/L, as determined by experiments on *Elliptio complanata* (Sparks and Strayer 1998).

b. Adult stress is defined as mean pore water DO for the site <1 mg/L, as determined by Lewis 1984.

Figure Legends

Figure 1. Site map, with non-clubshell sites (OCS) in white circles, and clubshell sites (CS) in black circles.

Figure 2. Pore water dissolved oxygen (DO) concentration by sampling date and clubshell population rank (1=best site, 6=worst site, Table 1). Each dot represents the mean DO from 5 samplers within a particular site during that sampling date. The best-fit regression line is shown for dates on which there was a significant relationship between clubshell population rank and DO concentration. For 7/19/10, the equation is: $DO = 1.7 - 0.23 * rank$, with $r^2 = 0.22$. For 8/3/10, the equation is: $DO = 1.58 - 0.2 * rank$, with $r^2 = 0.19$. Solid horizontal black lines represent the threshold for juvenile death in *Elliptio complanata* (1.3 mg/L, Sparks and Strayer 1998) and dashed horizontal black lines represent the threshold for adult stress (1 mg/L, Lewis 1984).

Figure 3. Dissolved oxygen (DO) concentrations in groundwater by clubshell rank (1=best site, 6=worst site, Table 1). Each dot represents the mean from 20 mini-piezometers and error bars represent the standard error of the mean from each site. All sites were sampled in July.

Figure 4. Pore water ammonia (NH_3) concentrations by sampling date and clubshell population rank (1=best site, 6=worst site, Table 1). Each dot represents the mean NH_3 from 5 samplers within a particular site during that sampling date. The best-fit regression line is shown for dates on which there was a significant relationship between clubshell population rank and NH_3 concentration. The equations are as follows: 7/30/09, $NH_3 = 10.8 - 1.67 * rank$, $r^2 = 0.42$; 8/11/09, $NH_3 = 18.4 - 3.2 * rank$, $r^2 = 0.63$; 9/16/09, $NH_3 = 11.3 - 2 * rank$, $r^2 = 0.54$; 10/1/09, $NH_3 = 11 - 2 * rank$, $r^2 = 0.55$. All measurements were below previously-identified thresholds of NH_3 stress.

Figure 5. Sediment-bound ammonia (NH_3) concentrations by sampling date and clubshell population rank (1=best site, 6=worst site, Table 1). Each dot represents the natural log of the

mean sediment-bound NH_3 from 5 samplers within a particular site on that sampling date. The best-fit regression line is shown for dates on which there was a significant relationship between clubshell population rank and NH_3 concentration. The equations are as follows: 9/16/09, $\text{NH}_3 = 8 + 2.5 * \text{rank}$, $r^2 = 0.09$; 8/4/10, $\text{NH}_3 = -13.7 + 19.6 * \text{rank}$, $r^2 = 0.14$; 9/22/10, $\text{NH}_3 = 3.5 + 2 * \text{rank}$, $r^2 = 0.13$. The solid horizontal line represents the EC_{50} for NH_3 in juveniles and the dashed horizontal line represents the lethal level for NH_3 in juveniles.

Figure 6. Relationship between clubshell population rank (1=best site, 6=worst site, Table 1) and interstitial sedimentation rate, expressed as the % pore space filled in Whitlock-Vibert (W-V) samplers. Each dot represents the mean from 10 replicate W-V samplers deployed at each site, and error bars are the standard error of the mean. In 2009, % pore space filled = $2.0 * \text{rank} - 43.7$, with $r^2 = 0.10$. In 2010, % pore space filled = $2.6 * \text{rank} + 22.5$, with $r^2 = 0.22$.

Figure 7. Relationship between clubshell population rank (1=best site, 6=worst site, Table 1) and sediment size class distribution. Each dot represents the mean of 10 replicate sediment samples taken to a depth of 9 cm, and the error bars represent the standard error of the mean at each site. The best fit regression lines is shown for dates on which there was a statistically significant relationship between clubshell rank and % sediment in that size class. Equations are as follows: % sediment <0.5mm = $17.8 + 1.89 * \text{rank}$, $r^2 = 0.07$; % sediment 0.5-1mm = $5.5 + 1.24 * \text{rank}$, $r^2 = 0.24$; % sediment >2mm = $66 - 3.28 * \text{rank}$, $r^2 = 0.12$.

Figure 2
145x111mm (600 x 600 DPI)

Figure 3
118x92mm (300 x 300 DPI)

Figure 4
139x118mm (600 x 600 DPI)

Figure 5
145x111mm (600 x 600 DPI)

Roley and Tank Supplementary Materials – methods and figures

Methods – Peeper Deployment

To examine the fine-scale vertical distribution of pore water NH_4^+ and NO_3^- within the sediments, we deployed multi-chambered equilibrium dialysis samplers, or peepers, at all the sites in 2010 (Hesslein 1976; Teasdale et al. 1995). Our peepers were constructed from a solid piece of plastic, which contained wells (1 cm height x 5 cm width x 3 cm depth) spaced 1 cm apart. We filled the peepers with deionized water, covered with a Biodyne nylon membrane (0.2 μm pore size, Pall, Ann Arbor, MI) while submersed in deionized water, and then placed them in a large zippered plastic bag filled with deionized water. We bubbled N_2 gas overnight into the water to remove oxygen before deployment. We had a limited supply of peepers, and so we deployed them at two sites at a time, CS site and one OCS site. At each site, we deployed two peepers vertically into the sediments, and left them in place for two weeks to allow equilibration with the pore water (Webster et al. 1998). After two weeks, we retrieved each peeper from the sediment, and then sampled each well by puncturing the membrane with a needle attached to a syringe, drawing up the water, and placing it in an acid-washed polypropylene bottle. We transported peeper samples to the laboratory on ice, and froze them for later analysis.

Literature Cited

Webster, I.T., Teasdale, P.R., and Grigg, N.J. 1998. Theoretical and experimental analysis of peeper equilibration dynamics. *Environ. Sci. Technol.* **32**: 1727-1733.

Results – Ammonium and ammonia concentrations

Note: All results reported as mean $\pm$ 1 standard error.

Supplemental Figures

Supplemental Figure1. Pore water NH₄⁺ concentrations by clubshell population rank and date. Each dot represents the mean NH₄⁺ from 5 pore water samplers within a particular site during that sampling date. The relationship between rank and NH₄⁺ was not statistically significant on any date.

Supplemental Figure 2. Sediment-bound NH₄⁺ concentrations by clubshell population rank and date. Each dot represents the mean NH₄⁺ from 10 samples within a particular site during that sampling date. The best-fit regression line is shown for dates on which there was a significant relationship between clubshell population rank and NH₄⁺ concentration.

Supplemental Fig. 3. Relationships among explanatory variables, including sediment organic matter content and pore water DO in A) 2009 and B) 2010; sediment organic matter content and

sediment-bound NH_4^+ in C) 2009 and D) 2010; pore water DO and pore water NH_4^+ in E) 2009 and F) 2010. All variables were rank-transformed, and panels C, D, E, and F are shown on a log scale.

Draft

Meta-Data for Roley and Tank datasets included in the Supplementary Information

Site Names

Sites that have clubshell are referred to as CS1, CS2, and CS3.
Sites that do not have clubshell are referred to as OCS1, OCS2, and OCS3.
The column titled "Location" refers to the name of the nearest road crossing or other landmark, according to the table below.
The column titled "CS presence" refers to clubshell presence/absence, with a value of 1 corresponding to clubshell presence and a value of 0 corresponding to mussel absence.
CS Rank is as described in the Methods.

Site Name	CS presence	CS Rank	Location
CS1	1	3	CR 100
CS2	1	1	CR 700
CS3	1	2	Potawatomi Park
OCS1	0	6	CR 300
OCS2	0	5	Chinworth
OCS3	0	4	20th Rd

Data set descriptions

S3. Roley and Tank pore-water

This data set includes measurements of pore water dissolved oxygen, nitrate, ammonium, and ammonia concentrations, along with water temperature, pH, and the pKa for NH₃. These samples were all taken from pore water oxygen samplers, which were deployed at a depth of 7.5 cm (top of sampler) to 10 cm depth (bottom of sampler). The units for DO are milligrams of oxygen per liter, the units for nitrate, ammonium, and ammonia are micrograms of N per liter, and the units for temperature are degrees Celcius. In this dataset, "Rep" refers to an individual sampler within a site. "NA" signifies data were not collected because of equipment failure or other obstacle.

S4. Roley and Tank sedimentation rate

This data set includes measurements of interstitial sedimentation rates, as measured with modified Whitlock-Vibert samplers. It includes the sedimentation rate, measured in both milliliters per day and in grams per day (columns "Sed_Rate_ml.d" and "Sed_Rate_g.d", respectively). It also includes the organic matter in the sedimented material, expressed as a percent (column "Organic_matter_pct") and as milligrams of organic matter sedimented per day (column "OM_sed.rate_mg.d"). The rates are included for each sediment size class (> 2mm, 1-2 mm, 0.5-1 mm, and < 0.5 mm), as well as the rates for all size classes combined (TOTAL). Finally, "pore-space-filled_pct" refers to the percent of the pore space in the sampler that was filled in with sediment. The "pore-space-filled_pct" was only calculated for the TOTAL size class and so this column has "NA" for other size classes. In this dataset, "Rep" refers to an individual sampler within a site, and "Sampler" is a unique identifier to the particular sampler, which was used only in 2010.

S5. Roley and Tank ambient size class

This data set includes sediment size class and organic matter content data taken at each site in July 2010. All data are from 9-cm depth x 3.6-cm diameter cores, each taken close to a W-V sampler. “Core” refers to the sampler number on the nearest Whitlock-Vibert sampler. “DW-g” is the dry weight in grams, “AFDM_g” is the ash-free dry mass, in g, determined by loss-on-ignition, “pct_OM” is the percent organic matter, determined by loss-on-ignition, “total_vol_ml” is the total volume of the core, in milliliters, determined by water displacement, “total_core_DW” is the total dry weight of the core in grams (all size classes added up), “total_core_AFDM” is the total ash-free dry mass in the core in grams (all size classes added up), “pct_vol” is the percent of the total core volume in that size class, “pct_DW” is the percent of the total core dry weight in that size class, and “pct_AFDM” is the percent of the total core ash-free dry mass in that size class.

S6. Roley and Tank sediment bound

This data set includes measurements of sediment-bound nitrate, ammonium, and ammonia. These samples were taken at a depth of 7 cm and nutrients were extracted via the addition of 2 M KCl (details in Methods section of manuscript). “Rep” here refers to replicate samples taken within a particular site. All three analytes are expressed in micrograms of N per liter (NO3_ugN.L, NH4_ugN.L, and NH3_ugN.L, respectively) and in micrograms of N per gram of sediment (NO3_ugN.gsed, NH4_ugN.gsed, and NH3_ugN.gsed, respectively). Also included are surface water temperature in degrees Celcius, surface water pH, bulk density (BD_g.ml), percent organic matter (pct_OM), and the pKa for NH3. Concentrations that were below detection are reported as < detection limit (usually, <5) when expressed as ug N/L and simply as “BD” when expressed as ug N/g sediment. Missing data are noted with “NA.”

Site	Location	Mussel_Pr	Date	Rep	NO3_ugN.L	NH4_ugN.L	pH	T
OCS1	CR 300	0	7/9/2009		4	671.57	30.58209	8.51
OCS1	CR 300	0	7/9/2009		3	554.7709	13.03615	8.41
OCS1	CR 300	0	7/9/2009		5	712.9651	15.33848	8.47
OCS1	CR 300	0	7/9/2009		2	722.8011	13.1816	8.42
OCS1	CR 300	0	7/9/2009		1	271.485	108.7217	8.32
CS1	CR 100	1	7/9/2009		2	569.5109	87.93216	8.4
CS1	CR 100	1	7/9/2009		4	554.098	16.31404	8.4
CS1	CR 100	1	7/9/2009		3	353.0985	135.4107	8.4
CS1	CR 100	1	7/9/2009		1	276.8483	81.20373	8.44
CS3	PWP	1	7/9/2009		1	208.1332	410.8292	8.28
CS3	PWP	1	7/9/2009		5	46.71546	72.48398	8.43
CS1	CR 100	1	#####		4	80.17643	147.3445	7.83
CS1	CR 100	1	#####		3	72.62515	84.78079	7.81
CS1	CR 100	1	#####		5	321.2534	103.6192	7.8
CS1	CR 100	1	#####		2	72.27458	184.5164	7.77
OCS1	CR 300	0	#####		2	189.6741	133.6464	7.87
OCS1	CR 300	0	#####		5	353.5498	124.3212	7.73
OCS1	CR 300	0	#####		1	447.2679	17.89386	7.6
OCS1	CR 300	0	#####		4	543.2022	12.17175	7.63
OCS1	CR 300	0	#####		3	383.0699	10.81778	7.62
OCS2	Chinworth	0	#####		1	93.96538	1132.043	7.29
OCS2	Chinworth	0	#####		3	78.01259	632.3173	7.38
OCS2	Chinworth	0	#####		2	92.547	529.8513	7.39
OCS2	Chinworth	0	#####		5	556.7978	83.32514	7.55
OCS2	Chinworth	0	#####		4	366.0815	108.9807	7.4
OCS3	20th Rd	0	#####		2	840.7969	32.66684	7.48
OCS3	20th Rd	0	#####		1	679.6532	13.99043	7.51
OCS3	20th Rd	0	#####		3	673.8709	11.20801	7.46
CS1	CR 100	1	#####		4	70.36057	143.136	7.82
CS1	CR 100	1	#####		3	185.2577	188.1786	7.61
CS1	CR 100	1	#####		2	159.5253	133.0445	7.6
CS1	CR 100	1	#####		1	203.2736	54.05944	7.78
CS2	CR 700	1	#####		1	928.5836	13.49969	7.72
CS2	CR 700	1	#####		3	703.5159	12.11972	7.9
CS2	CR 700	1	#####		2	934.9301	13.2289	7.88
CS2	CR 700	1	#####		4	736.2314	9.597443	7.96
CS3	PWP	1	#####		1	22.75203	627.2444	7.57
CS3	PWP	1	#####		3	168.362	335.5335	7.82
CS3	PWP	1	#####		2	176.961	448.5273	7.36
OCS1	CR 300	0	#####		3	328.0632	13.59193	7.47
OCS1	CR 300	0	#####		1	254.3032	43.9065	7.6
OCS1	CR 300	0	#####		2	348.1946	22.01133	7.44
OCS1	CR 300	0	#####		5	263.1359	16.04089	7.41
OCS1	CR 300	0	#####		4	444.9832	15.63292	7.44
OCS2	Chinworth	0	#####		3	220.1854	252.6225	7.22
OCS2	Chinworth	0	#####		1	427.8215	321.4215	7.33

OCS2	Chinworth	0	#####	2	181.1315	655.6339	7.09	26.05
OCS2	Chinworth	0	#####	4	143.9997	823.6163	7.17	25.68
OCS2	Chinworth	0	#####	5	166.9275	553.227	7.16	25.29
OCS3	20th Rd	0	#####	4	359.6424	170.6539	7.65	24.95
OCS3	20th Rd	0	#####	1	138.2979	317.0368	7.74	24.35
OCS3	20th Rd	0	#####	5	524.4852	125.609	7.42	24.75
OCS3	20th Rd	0	#####	2	171.3439	331.8311	7.53	24.65
OCS3	20th Rd	0	#####	3	370.0184	168.581	7.64	24.97
CS1	CR 100	1	#####	1	175.2887	177.2665	7.46	23.6
CS1	CR 100	1	#####	4	181.3048	125.5215	7.51	23.76
CS1	CR 100	1	#####	3	168.5555	158.6043	7.36	23.75
CS1	CR 100	1	#####	2	76.92462	154.5802	7.5	23.65
CS2	CR 700	1	#####	4	1171.087	29.22576	7.58	22.05
CS2	CR 700	1	#####	1	876.8207	45.24509	7.6	22.31
CS2	CR 700	1	#####	3	549.1498	71.25181	7.55	22.21
CS2	CR 700	1	#####	2	563.2248	38.85013	7.55	22.14
CS2	CR 700	1	#####	5	693.0876	120.7264	7.56	22.09
CS3	PWP	1	#####	4	144.7532	480.0137	7.36	24.07
CS3	PWP	1	#####	1	415.6404	359.1669	7.55	23.24
CS3	PWP	1	#####	3	119.4923	514.6396	7.47	23.98
OCS1	CR 300	0	#####	2	548.9604	11.23521	7.53	19.13
OCS1	CR 300	0	#####	3	497.6085	10.91238	7.44	19.44
OCS1	CR 300	0	#####	1	170.5984	22.7906	7.51	19.77
OCS1	CR 300	0	#####	4	51.82487	71.11701	7.35	19.6
OCS2	Chinworth	0	#####	2	168.0518	412.7271	7.18	20.42
OCS2	Chinworth	0	#####	4	190.069	522.1012	7.25	20.06
OCS2	Chinworth	0	#####	3	202.7377	217.9126	7.24	20.23
OCS2	Chinworth	0	#####	1	87.90098	449.9936	7	20.9
OCS2	Chinworth	0	#####	5	153.7752	304.4337	7.21	19.84
OCS3	20th Rd	0	#####	4	166.988	497.828	7.43	19.91
OCS3	20th Rd	0	#####	2	75.24432	213.5822	7.22	20.34
OCS3	20th Rd	0	#####	1	111.1915	224.1739	7.06	21.4
OCS3	20th Rd	0	#####	5	71.49286	308.5133	7.28	19.79
OCS3	20th Rd	0	#####	3	75.59086	187.812	7.16	21.95
CS1	CR 100	1	#####	1	330.2875	133.4076	7.47	19.03
CS1	CR 100	1	#####	3	197.862	206.0166	7.43	19.36
CS1	CR 100	1	#####	2	43.77393	224.5145	7.28	18.9
CS1	CR 100	1	#####	4	201.4362	167.2282	7.42	18.92
CS2	CR 700	1	#####	3	1081.14	17.61716	7.55	17.76
CS2	CR 700	1	#####	1	156.4508	295.6643	7.55	16.34
CS2	CR 700	1	#####	4	400.8118	145.9208	7.53	17.9
CS2	CR 700	1	#####	2	197.6646	213.9003	7.57	16.49
CS3	PWP	1	#####	4	158.6993	435.0113	7.3	20.4
CS3	PWP	1	#####	1	432.3144	138.3906	7.48	17.66
CS3	PWP	1	#####	3	78.95146	423.8508	7.36	20.78
OCS3	20th Rd	0	#####	5	67.51574	310.701	7.51	16.27
OCS3	20th Rd	0	#####	4	94.10238	463.4055	7.71	18.05

OCS3	20th Rd	0 #####	1	31.6814	213.4995	7.31	17.18
OCS3	20th Rd	0 #####	2	81.19992	117.3693	7.47	15.57
OCS3	20th Rd	0 #####	3	15.84546	162.6792	7.36	17.67
CS1	CR 100	1 #####	3	454.1664	73.40869	7.82	11.73
CS1	CR 100	1 #####	4	328.4138	93.46034	7.83	11.76
CS1	CR 100	1 #####	2	119.182	150.6188	7.71	11.67
CS1	CR 100	1 #####	1	34.3731	97.86043	7.65	11.92
CS2	CR 700	1 #####	3	1281.745	6.189478	7.73	15.25
CS2	CR 700	1 #####	1	814.7905	53.16429	7.7	15.43
CS2	CR 700	1 #####	4	916.205	20.95772	7.72	15.12
CS2	CR 700	1 #####	2	245.0757	122.4233	7.8	15.29
CS3	PWP	1 #####	3	329.0384	125.6634	7.94	14.43
CS3	PWP	1 #####	2	189.4847	203.0485	7.75	14.95
CS3	PWP	1 #####	1	91.39456	415.1122	7.68	16.3
CS3	PWP	1 #####	4	23.57002	85.51394	8.32	14.1
OCS1	CR 300	0 #####	2	724.4129	2.980173	7.9	12.57
OCS1	CR 300	0 #####	3	749.3233	1.561173	7.82	13.1
OCS1	CR 300	0 #####	1	604.0517	3.903705	7.76	12.01
OCS1	CR 300	0 #####	5	566.8272	10.74329	7.68	13.55
OCS1	CR 300	0 #####	4	111.538	41.01765	7.7	12.95
OCS2	Chinworth	0 #####	3	1246.628	11.72358	7.84	14.93
OCS2	Chinworth	0 #####	2	66.41569	355.7519	7.64	15.26
OCS2	Chinworth	0 #####	1	78.72984	382.9635	7.38	14.58
OCS2	Chinworth	0 #####	5	63.34924	218.3288	7.47	14.87
OCS2	Chinworth	0 #####	4	40.48989	218.0675	7.57	14.84
OCS1	CR 300	0 #####	3	266.4906	83.46473	7.62	25.79
OCS1	CR 300	0 #####	2	274.3272	23.29663	7.73	24.52
OCS1	CR 300	0 #####	1	33.8531	91.40478	7.66	23.92
OCS1	CR 300	0 #####	4	28.4668	125.1165	7.55	25.68
OCS2	Chinworth	0 #####	2	398.8188	408.399	7.32	27.76
OCS2	Chinworth	0 #####	3	137.724	484.924	7.32	27.19
OCS2	Chinworth	0 #####	1	89.75395	1841.471	7.32	28.16
OCS2	Chinworth	0 #####	4	88.0545	641.944	7.32	27.47
OCS2	Chinworth	0 #####	5	133.6139	967.2046	7.32	27.82
CS1	CR 100	1 #####	4	276.6769	87.17366	7.54	25.11
CS1	CR 100	1 #####	1	38.22975	166.1724	7.63	24.97
CS1	CR 100	1 #####	2	66.1786	493.1368	7.56	24.98
CS1	CR 100	1 #####	3	33.39995	432.6777	7.57	25.09
CS2	CR 700	1 #####	4	1002.55	15.91969	7.59	27.59
CS2	CR 700	1 #####	3	743.6985	10.64596	7.59	27.15
CS2	CR 700	1 #####	2	1039.7	11.25835	7.59	27.24
CS2	CR 700	1 #####	1	665.3208	9.77309	7.59	27.67
OCS3	20th Rd	0 #####	4	251.9767	264.7351	7.37	26.48
OCS3	20th Rd	0 #####	3	85.0045	242.6003	7.37	26.32
OCS3	20th Rd	0 #####	2	74.72635	195.6681	7.37	26.32
OCS3	20th Rd	0 #####	1	71.1824	351.8981	7.37	26.45
CS3	PWP	1 #####	2	154.1244	148.0881	7.47	28.2

CS3	PWP	1	#####	3	98.98795	503.6728	7.47	27.92
CS3	PWP	1	#####	1	135.582	77.9616	7.47	26.94
CS3	PWP	1	#####	4	71.7708	489.2689	7.47	27.45
OCS1	CR 300	0	8/2/2010	3	288.7957	16.21296	7.55	25.22
OCS1	CR 300	0	8/2/2010	1	45.47125	36.4655	7.44	24.2
OCS1	CR 300	0	8/2/2010	2	54.5571	51.27442	7.56	24.11
OCS1	CR 300	0	8/2/2010	4	27.37095	77.45447	7.59	25.15
OCS2	Chinworth	0	8/2/2010	5	56.3852	1766.787	7.31	27.43
OCS2	Chinworth	0	8/2/2010	1	65.0112	986.5325	7.33	26.8
OCS2	Chinworth	0	8/2/2010	3	52.5988	784.3225	7.2	27.79
OCS2	Chinworth	0	8/2/2010	2	71.5207	648.1886	7.3	26.8
OCS2	Chinworth	0	8/2/2010	4	62.3587	471.3754	7.33	27.24
CS1	CR 100	1	8/2/2010	4	93.24085	70.8015	7.53	24.88
CS1	CR 100	1	8/2/2010	2	25.86935	317.1939	7.76	24.44
CS1	CR 100	1	8/2/2010	3	23.2499	334.4581	7.63	24.76
CS1	CR 100	1	8/2/2010	1	50.22385	112.1464	7.81	24.2
OCS3	20th Rd	0	8/3/2010	4	48.378	405.8332	7.3	24.25
OCS3	20th Rd	0	8/3/2010	3	47.38245	195.9476	7.36	23.96
OCS3	20th Rd	0	8/3/2010	1	62.6191	333.4589	7.43	23.71
OCS3	20th Rd	0	8/3/2010	2	35.66475	261.7157	7.36	23.91
CS2	CR 700	1	8/3/2010	2	907.5463	12.88879	7.69	26.97
CS2	CR 700	1	8/3/2010	3	875.3072	8.28932	7.76	27.17
CS2	CR 700	1	8/3/2010	5	604.3866	77.026	7.89	26.57
CS2	CR 700	1	8/3/2010	1	375.0346	40.67319	7.41	26.44
CS2	CR 700	1	8/3/2010	4	216.9378	279.2176	7.84	26.67
CS3	PWP	1	8/3/2010	1	301.6835	26.06302	7.37	25.11
CS3	PWP	1	8/3/2010	3	47.9852	485.6219	7.38	25.01
CS3	PWP	1	8/3/2010	4	80.4721	446.7435	7.43	24.97
CS3	PWP	1	8/3/2010	2	88.4277	86.06232	7.44	22.95
OCS3	20th Rd	0	#####	1	29.8411	394.2445	7.84	24.75
OCS3	20th Rd	0	#####	2	33.85715	402.6933	7.16	24.32
OCS3	20th Rd	0	#####	3	20.29075	268.9645	7.29	25.12
OCS3	20th Rd	0	#####	4	24.8769	506.4478	7.31	24.41
CS1	CR 100	1	#####	1	129.2167	54.94987	7.65	24.9
CS1	CR 100	1	#####	3	29.1265	411.5991	7.63	24.97
CS1	CR 100	1	#####	2	19.1519	159.9412	7.66	25.2
CS3	PWP	1	#####	3	353.6885	189.5892	7.73	23.79
CS3	PWP	1	#####	1	14.54625	552.3692	7.44	24.04
CS3	PWP	1	#####	4	43.62875	89.31767	7.48	21.78
CS3	PWP	1	#####	2	30.38735	531.4696	7.57	24.67
OCS1	CR 300	0	#####	3	418.5529	0	7.7	21.89
OCS1	CR 300	0	#####	2	287.1583	8.732819	7.67	21.7
OCS1	CR 300	0	#####	4	109.2187	29.85436	7.63	22.16
OCS1	CR 300	0	#####	1	16.15815	79.65037	7.64	21.55
OCS2	Chinworth	0	#####	5	45.3466	1678.851	7.17	26.72
OCS2	Chinworth	0	#####	3	55.4568	636.1731	7.34	26.61
OCS2	Chinworth	0	#####	1	50.0161	873.4639	7.33	24.87

OCS2	Chinworth	0	#####	2	38.13065	607.9009	7.35	25.29
OCS2	Chinworth	0	#####	4	62.83955	2089.901	7.33	26
CS2	CR 700	1	#####	1	772.7253	29.4562	7.66	26.86
CS2	CR 700	1	#####	2	814.7955	9.335523	7.61	26.8
CS2	CR 700	1	#####	3	756.0045	61.85556	7.62	26.71
CS2	CR 700	1	#####	4	560.9354	18.27336	7.51	27.06
OCS3	20th Rd	0	9/1/2010	1	42.8466	476.2609	7.28	25.02
OCS3	20th Rd	0	9/1/2010	2	22.74175	458.3355	7.13	24.34
OCS3	20th Rd	0	9/1/2010	4	17.12985	761.6439	7.81	24.52
OCS3	20th Rd	0	9/1/2010	3	22.9193	514.2807	7.13	23.98
CS1	CR 100	1	9/1/2010	2	18.6572	468.433	7.57	23.82
CS1	CR 100	1	9/1/2010	1	42.89165	167.9582	7.57	23.48
CS1	CR 100	1	9/1/2010	4	221.2222	43.0897	7.62	24.08
CS1	CR 100	1	9/1/2010	5	33.58695	433.8593	7.46	23.92
CS1	CR 100	1	9/1/2010	3	13.5315	166.2946	7.61	24.07
CS3	PWP	1	9/1/2010	3	40.1572	92.8224	7.33	22.66
CS3	PWP	1	9/1/2010	4	214.1064	92.29017	7.62	25.32
CS3	PWP	1	9/1/2010	1	21.36715	546.3723	7.24	25.84
CS3	PWP	1	9/1/2010	2	24.8112	526.9925	7.49	25.15
OCS1	CR 300	0	9/3/2010	3	555.7029	16.3381	7.5	20.47
OCS1	CR 300	0	9/3/2010	2	306.2878	14.88282	7.55	20.45
OCS1	CR 300	0	9/3/2010	5	19.12555	1161.416	7.56	21.03
OCS1	CR 300	0	9/3/2010	1	81.5501	63.2983	7.54	20.54
OCS1	CR 300	0	9/3/2010	4	14.06155	37.47977	7.47	20.9
OCS2	Chinworth	0	9/3/2010	1	30.21335	1333.861	7.28	21.21
OCS2	Chinworth	0	9/3/2010	2	54.89385	1539.798	7.31	20.91
OCS2	Chinworth	0	9/3/2010	4	28.4866	662.3883	7.29	21.09
OCS2	Chinworth	0	9/3/2010	3	20.9337	387.1831	7.29	21.31
OCS2	Chinworth	0	9/3/2010	5	28.99305	657.6584	7.27	21.22
OCS1	CR 300	0	#####	3	463.9397	3.534567	7.54	19.45
OCS1	CR 300	0	#####	1	387.0589	19.94436	7.5	19.4
OCS1	CR 300	0	#####	2	396.5943	1.577868	7.48	19.5
OCS1	CR 300	0	#####	5	103.0001	275.9378	7.52	19.45
OCS1	CR 300	0	#####	4	198.8795	4.968684	7.56	19.46
CS1	CR 100	1	#####	2	463.2884	5.194746	7.42	22.55
CS1	CR 100	1	#####	1	84.0779	224.76	7.39	21.24
CS1	CR 100	1	#####	5	48.553	153.0766	7.4	22.14
CS1	CR 100	1	#####	4	16.3504	316.9983	7.52	22.23
CS1	CR 100	1	#####	3	46.9313	74.73067	7.37	22.38
OCS2	Chinworth	0	#####	5	27.8286	415.6931	7.3	21.96
OCS2	Chinworth	0	#####	1	83.50855	1455.9	7.61	21.6
OCS2	Chinworth	0	#####	4	46.21445	476.0342	7.45	21.76
OCS2	Chinworth	0	#####	3	74.314	449.5548	7.45	21.75
OCS2	Chinworth	0	#####	2	18.2272	273.6346	7.18	21.6
CS2	CR 700	1	#####	1	575.5432	78.25716	7.38	22.05
CS2	CR 700	1	#####	4	889.9445	4.936686	7.36	22.24
CS2	CR 700	1	#####	2	514.1499	8.788223	7.4	21.85

CS2	CR 700	1 #####	3	374.3358	31.46968	7.41	22.39
CS2	CR 700	1 #####	5	220.5636	36.8475	7.41	22.06
OCS3	20th Rd	0 #####	4	47.89	660.8455	7.6	21.65
OCS3	20th Rd	0 #####	1	69.4398	292.8992	7.19	21.37
OCS3	20th Rd	0 #####	3	72.02675	480.8684	7.21	21.7
OCS3	20th Rd	0 #####	2	25.2851	420.9609	7.17	21.27
CS3	PWP	1 #####	1	530.2602	9.326658	7.67	19.91
CS3	PWP	1 #####	2	26.4559	77.79866	7.33	18.16
CS3	PWP	1 #####	3	20.26975	495.8534	7.38	20.75
CS3	PWP	1 #####	4	29.7978	474.2515	7.32	21.09
OCS2	Chinworth	0 #####	2	179.614	430.8072	7.34	19.98
OCS2	Chinworth	0 #####	1	34.4972	1444.5	7.2	19.57
OCS2	Chinworth	0 #####	5	52.4827	291.4645	7.3	19.08
OCS2	Chinworth	0 #####	4	18.7363	204.6807	7.29	18.18
OCS2	Chinworth	0 #####	3	109.3779	476.4809	7.39	19.33
OCS3	20th Rd	0 #####	4	92.2327	283.2027	7.27	16
OCS3	20th Rd	0 #####	1	9.1968	393.4701	7.63	16.57
OCS3	20th Rd	0 #####	3	48.7257	322.3239	7.5	16.19
OCS3	20th Rd	0 #####	2	27.38	389.5583	7.36	16.35
CS1	CR 100	1 #####	2	468.364	3.962167	7.64	14.22
CS1	CR 100	1 #####	1	24.4299	199.368	7.49	14.49
CS1	CR 100	1 #####	3	174.2482	19.65563	7.6	14.5
CS1	CR 100	1 #####	5	73.6244	100.92	7.62	14.53
CS1	CR 100	1 #####	4	43.61035	241.5717	7.64	14.58
OCS1	CR 300	0 #####	3	431.4525	7.352231	7.77	14.77
OCS1	CR 300	0 #####	2	434.0342	3.452899	7.73	14.56
OCS1	CR 300	0 #####	4	444.1797	2.826455	7.66	14.96
OCS1	CR 300	0 #####	1	274.3084	4.004099	7.6	14.5
OCS1	CR 300	0 #####	5	30.1035	86.85974	7.55	15.32
CS2	CR 700	1 #####	2	1256	2.818361	7.62	18.73
CS2	CR 700	1 #####	4	678.3557	0.68382	7.67	17.91
CS2	CR 700	1 #####	3	1274.8	3.77426	7.68	17.98
CS2	CR 700	1 #####	5	904.3702	9.379405	7.63	18.12
CS2	CR 700	1 #####	1	539.3885	13.15354	7.6	17.89
CS3	PWP	1 #####	2	191.2376	70.11126	7.75	18.34
CS3	PWP	1 #####	3	20.4287	378.1924	7.54	17.55
CS3	PWP	1 #####	4	17.5695	474.3261	7.42	17.45
CS3	PWP	1 #####	1	18.2101	84.58582	7.42	19.12

pKa	NH3_ugN.L	DO_mg.L	CS rank
9.365211	3.745546	5.64	6
9.339443	1.372158	5.35	6
9.342891	1.812497	5.3	6
9.348854	1.389153	4.8	6
9.362061	9.047363	3.5	6
9.388273	8.192248	2.82	3
9.373728	1.566701	2.58	3
9.373728	13.00402	2.3	3
9.396197	8.087547	1.6	3
9.290193	NA	1.99	2
9.311325	8.419601	1.8	2
9.337563	4.440989	NA	3
9.345087	2.402834	2.32	3
9.342578	2.887928	1.4	3
9.344774	4.784662	1.21	3
9.433462	3.554582	NA	6
9.359857	2.848533	NA	6
9.396514	0.281389	NA	6
9.380362	0.212492	NA	6
9.367103	0.190252	NA	6
9.313194	10.63092	NA	5
9.327863	7.050223	NA	5
9.32505	6.082601	NA	5
9.330051	1.36012	NA	5
9.327863	1.271713	NA	5
9.292364	0.495569	NA	4
9.295157	0.225741	NA	4
9.30168	0.159089	NA	4
9.400323	3.665718	NA	3
9.406359	2.960226	NA	3
9.40191	2.066747	NA	3
9.397148	1.274562	NA	3
9.293916	11.73	NA	1
9.294847	11.715	NA	1
9.295467	11.705	NA	1
9.298262	11.66	NA	1
9.286474	11.82221	NA	2
9.280901	11.22176	NA	2
9.286784	5.246798	NA	2
9.304789	0.195968	2.98	6
9.310391	0.838994	2.17	6
9.312571	0.291266	1.88	6
9.31943	0.1952	1.69	6
9.317871	0.204387	1.51	6
9.202367	2.603789	2.56	5
9.224624	4.045295	1.5	5

9.214244	4.888403	1.17	5
9.225541	7.184206	0.85	5
9.237479	4.589928	0.51	5
9.247912	4.20125	2.12	4
9.266382	9.162045	1.98	4
9.25406	1.814021	1.48	4
9.257138	6.105402	1.42	4
9.247298	4.063627	0.61	4
9.289573	2.586249	2.77	3
9.284616	2.07427	2.43	3
9.284926	1.86319	1.99	3
9.288024	2.478059	1.92	3
9.337876	21.99723	2.62	1
9.329739	21.72526	1.57	1
9.332867	21.57333	1.53	1
9.335058	19.56132	0.88	1
9.336624	17.97269	0.64	1
9.275026	5.767369 NA		2
9.300747	6.264798	2.01	2
9.277808	7.888357	1.2	2
9.430265	0.1396	5.34	6
9.420369	0.112988	2.51	6
9.409858	0.283441	1.14	6
9.41527	0.606712	0.34	6
9.389223	2.533762	1.78	5
9.40064	3.664843	1.07	5
9.395245	1.513596	0.67	5
9.374043	1.893788	0.45	5
9.407631	1.919177	0.34	5
9.405406	5.213171	1.05	4
9.391758	1.428542	0.76	4
9.358284	1.122332	0.63	4
9.409221	2.274255	0.44	4
9.34101	1.229872	0.36	4
9.433462	1.435556	3.44	3
9.422921	2.072953	2.09	3
9.437621	1.551005	1.38	3
9.43698	1.592842	1.14	3
9.474251	17.6135	2.08	1
9.520281	13.23695	0.63	1
9.469737	13.67425	0.51	1
9.515398	11.31709	0.34	1
9.389856	3.508546	1.94	2
9.477478	1.378106	1.82	2
9.377834	4.029315	1.7	2
9.522562	2.989385	0.8	4
9.464905	8.007298	0.48	4

9.492997	1.391743	0.48	4
9.545431	0.978337	0.45	4
9.477155	1.232746	0.28	4
9.672881	1.015814	2.29	3
9.671872	1.326017	2.02	3
9.6749	1.615459	1.41	3
9.666495	0.93315	0.72	3
9.555922	15.03271	1.84	1
9.550018	15.16041	1.75	1
9.560191	12.30182	0.64	1
9.554609	12.10584	0.58	1
9.582912	2.795918	1.76	2
9.565779	3.056566	1.36	2
9.521584	5.89347	0.64	2
9.593818	4.322097	0.55	2
9.644709	0.052697	5.41	6
9.627018	0.023972	3.96	6
9.663472	0.048152	1.7	6
9.61205	0.124176	1.33	6
9.632019	0.474136	0.58	6
9.566437	0.216046	5.58	5
9.555594	4.268846	0.58	5
9.577964	2.4124	0.51	5
9.568411	1.726838	0.44	5
9.569398	2.162049	0.39	5
9.22218	2.035178	0.88	6
9.261141	0.666121	0.66	6
9.279664	2.142901	0.56	6
9.225541	2.586434	0.27	6
9.162394	5.787511	1.91	5
9.179612	6.608493	0.4	5
9.150351	26.81902	0.38	5
9.171146	8.918164	0.26	5
9.160586	13.76285	0.25	5
9.243	1.693808	0.74	3
9.247298	3.916539	0.52	3
9.246991	9.934326	0.45	3
9.243613	8.983368	0.28	3
9.167523	0.410273	3.66	1
9.180823	0.266293	2.59	1
9.178099	0.283339	2.21	1
9.165109	0.253234	0.96	1
9.20115	3.848587	1.44	4
9.206018	3.48806	0.43	4
9.206018	2.813277	0.43	4
9.202063	5.105142	0.42	4
9.149148	3.036508	1	2

9.157573	10.13326	0.37	2
9.187184	1.467054	0.34	2
9.17175	9.533483	0.3	2
9.239625	0.324677	1.57	6
9.271011	0.530285	0.67	6
9.27379	0.972291	0.55	6
9.241772	1.689264	0.47	6
9.172354	23.92808	0.42	5
9.19143	13.38896	0.39	5
9.16149	8.477834	0.32	5
9.19143	8.217322	0.32	5
9.178099	6.594011	0.29	5
9.250063	1.32368	1.52	3
9.263607	9.645117	0.45	3
9.253753	7.769292	0.4	3
9.271011	3.749774	0.33	3
9.269467	4.307705	1.25	4
9.278427	2.336168	0.79	4
9.286165	4.580062	0.62	4
9.279973	3.109324	0.52	4
9.186275	0.398384	4.11	1
9.180217	0.303462	2.02	1
9.198414	3.608964	1.27	1
9.202367	0.645643	0.97	1
9.195376	11.79822	0.66	1
9.243	0.344545	1.78	2
9.246069	6.521642	0.61	2
9.247298	6.701867	0.51	2
9.309768	1.1461	0.42	2
9.25406	14.63123	0.41	4
9.267307	3.120961	0.4	4
9.242693	2.966103	0.35	4
9.264531	5.5617	0.3	4
9.249449	1.348126	0.84	3
9.247298	9.701033	0.48	3
9.240239	4.096872	0.38	3
9.283687	5.154141	1.95	2
9.275953	7.943018	0.91	2
9.346342	1.198745	0.42	2
9.256522	10.71787	0.28	2
9.342891	0	2.55	6
9.348854	0.179183	1.17	6
9.334432	0.578206	0.49	6
9.353566	1.511133	0.46	6
9.193858	15.74209	0.5	5
9.197199	8.717344	0.49	5
9.250371	10.36785	0.38	5

9.237479	7.776108	0.23	5
9.215769	26.83758	0.21	5
9.18961	0.845131	2.49	1
9.19143	0.23849	1.71	1
9.194162	1.606168	1.2	1
9.183548	0.379452	0.73	1
9.245762	5.098103	0.58	4
9.26669	3.321503	0.5	4
9.261141	26.032	0.47	4
9.277808	3.633396	0.38	4
9.282758	8.903384	1.02	3
9.293295	3.11724	0.78	3
9.274717	0.933563	0.74	3
9.279664	6.47375	0.52	3
9.275026	3.52014	0.32	3
9.318806	0.942785	1.33	2
9.23656	2.178811	1.2	2
9.220653	5.653519	1.12	2
9.241772	9.170814	0.52	2
9.387639	0.208917	2.71	6
9.388273	0.21289	0.72	6
9.369941	17.71623	0.42	6
9.385423	0.890867	0.35	6
9.374043	0.461711	0.35	6
9.364266	10.89638	0.59	5
9.373728	13.18263	0.36	5
9.368048	5.488463	0.35	5
9.361117	3.25933	0.28	5
9.363951	5.254909	0.27	5
9.42005	0.045983	3.62	6
9.421645	0.23605	3.3	6
9.418456	0.017974	1.35	6
9.42005	3.430271	0.55	6
9.419731	0.067694	0.54	6
9.32224	0.064257	2.2	3
9.363321	2.364853	1.13	3
9.335058	1.757262	0.63	3
9.332241	4.810332	0.38	3
9.32755	0.815053	0.38	3
9.340697	3.750934	0.7	5
9.351995	25.90241	0.49	5
9.34697	5.959322	0.3	5
9.347284	5.623819	0.29	5
9.351995	1.829208	0.23	5
9.337876	0.852881	1.01	1
9.331928	0.052107	0.9	1
9.344146	0.09882	0.62	1

9.327238	0.376211	0.43	1
9.337563	0.430273	0.42	1
9.350424	11.53528	0.74	4
9.359228	1.970419	0.5	4
9.348854	3.467602	0.35	4
9.362376	2.685875	0.34	4
9.405406	0.168425	1.87	2
9.461365	0.570702	0.64	2
9.378782	4.923096	0.32	2
9.368048	4.208134	0.31	2
9.403181	3.692862	0.71	5
9.416225	8.726909	0.45	5
9.431863	2.135644	0.45	5
9.460722	1.37225	0.32	5
9.423878	4.366856	0.24	5
9.53137	1.542961	1	4
9.512795	5.087042	0.6	4
9.52517	3.013307	0.5	4
9.519955	2.67684	0.46	4
9.589849	0.043978	3.76	3
9.580932	1.604039	1.51	3
9.580602	0.203407	0.83	3
9.579613	1.09553	0.81	3
9.577964	2.75487	0.42	3
9.571703	0.114265	6.12	6
9.578623	0.048245	5.48	6
9.56545	0.034708	3.34	6
9.580602	0.041437	2.05	6
9.553625	0.852919	0.51	6
9.443065	0.04173	4	1
9.469415	0.010683	3.16	1
9.467159	0.060623	3.05	1
9.462652	0.135889	1.54	1
9.470059	0.175051	1.05	1
9.455578	1.354371	2.11	2
9.48103	4.282889	1.5	2
9.484261	4.055891	1.02	2
9.430584	0.817514	0.81	2

Year	Location	Site	Mussel_Pr	Sampler	Rep	Size.Class	pore.space	Organic_m
2009	CR 700	CS2	1	NA		7 <0.5 mm	NA	NA
2010	CR 700	CS2	1		33	5 <0.5 mm	NA	4.9479
2010	CR 700	CS2	1		24	2 <0.5 mm	NA	4.7156
2010	CR 700	CS2	1		27	3 <0.5 mm	NA	4.5758
2009	CR 300	OCS1	0	NA		9 <0.5 mm	NA	4.49
2010	CR 700	CS2	1		35	6 <0.5 mm	NA	4.4401
2010	CR 700	CS2	1		32	4 <0.5 mm	NA	4.2322
2010	CR 700	CS2	1		15	1 <0.5 mm	NA	4.2246
2009	CR 300	OCS1	0	NA		6 <0.5 mm	NA	4.12
2010	CR 700	CS2	1		45	7 <0.5 mm	NA	4.0698
2009	20th Rd	OCS3	0	NA		9 <0.5 mm	NA	3.51
2010	CR 100	CS1	1		54	6 <0.5 mm	NA	3.3726
2010	CR 700	CS2	1		63	9 <0.5 mm	NA	3.3535
2010	CR 700	CS2	1		66	10 <0.5 mm	NA	3.2303
2009	CR 300	OCS1	0	NA		8 <0.5 mm	NA	3.15
2010	CR 100	CS1	1		59	7 <0.5 mm	NA	3.1402
2009	CR 700	CS2	1	NA		3 <0.5 mm	NA	2.74
2010	CR 700	CS2	1		57	8 <0.5 mm	NA	2.7249
2010	20th Rd	OCS3	0		29	6 <0.5 mm	NA	2.6877
2009	Chinworth	OCS2	0	NA		5 <0.5 mm	NA	2.6
2009	CR 700	CS2	1	NA		6 <0.5 mm	NA	2.5
2010	CR 100	CS1	1		21	4 <0.5 mm	NA	2.4834
2009	CR 700	CS2	1	NA		4 <0.5 mm	NA	2.45
2010	20th Rd	OCS3	0		14	2 <0.5 mm	NA	2.359
2010	CR 100	CS1	1		68	9 <0.5 mm	NA	2.3531
2010	CR 100	CS1	1		5	1 <0.5 mm	NA	2.3301
2010	20th Rd	OCS3	0		3	1 <0.5 mm	NA	2.2446
2010	20th Rd	OCS3	0		30	7 <0.5 mm	NA	2.1967
2009	CR 300	OCS1	0	NA		7 <0.5 mm	NA	2.04
2009	CR 300	OCS1	0	NA		2 <0.5 mm	NA	1.84
2009	PWP	CS3	1	NA		1 <0.5 mm	NA	1.77
2009	20th Rd	OCS3	0	NA		3 <0.5 mm	NA	1.76
2010	20th Rd	OCS3	0		23	5 <0.5 mm	NA	1.7591
2009	CR 700	CS2	1	NA		1 <0.5 mm	NA	1.7
2010	Chinworth	OCS2	0		67	9 <0.5 mm	NA	1.6838
2009	Chinworth	OCS2	0	NA		6 <0.5 mm	NA	1.68
2010	Chinworth	OCS2	0		62	8 <0.5 mm	NA	1.6796
2010	Chinworth	OCS2	0		4	1 <0.5 mm	NA	1.6646
2009	Chinworth	OCS2	0	NA		10 <0.5 mm	NA	1.66
2009	CR 300	OCS1	0	NA		4 <0.5 mm	NA	1.61
2009	CR 300	OCS1	0	NA		3 <0.5 mm	NA	1.58
2009	PWP	CS3	1	NA		13 <0.5 mm	NA	1.58
2010	PWP	CS3	1		38	6 <0.5 mm	NA	1.5719
2009	Chinworth	OCS2	0	NA		2 <0.5 mm	NA	1.56
2010	20th Rd	OCS3	0		18	4 <0.5 mm	NA	1.5463
2010	PWP	CS3	1		28	3 <0.5 mm	NA	1.5423

2010 CR 100	CS1	1	53	5 <0.5 mm	NA	1.4848
2009 Chinworth	OCS2	0 NA		8 <0.5 mm	NA	1.47
2009 Chinworth	OCS2	0 NA		9 <0.5 mm	NA	1.47
2009 20th Rd	OCS3	0 NA		6 <0.5 mm	NA	1.47
2009 CR 300	OCS1	0 NA		1 <0.5 mm	NA	1.46
2009 CR 100	CS1	1 NA		1 <0.5 mm	NA	1.43
2010 Chinworth	OCS2	0	60	7 <0.5 mm	NA	1.4102
2010 Chinworth	OCS2	0	13	3 <0.5 mm	NA	1.3965
2010 20th Rd	OCS3	0	34	8 <0.5 mm	NA	1.3912
2010 20th Rd	OCS3	0	16	3 <0.5 mm	NA	1.391
2009 20th Rd	OCS3	0 NA		4 <0.5 mm	NA	1.39
2010 Chinworth	OCS2	0	6	2 <0.5 mm	NA	1.3618
2010 CR 100	CS1	1	11	3 <0.5 mm	NA	1.3542
2009 CR 300	OCS1	0 NA		5 <0.5 mm	NA	1.33
2010 CR 100	CS1	1	8	2 <0.5 mm	NA	1.3192
2010 Chinworth	OCS2	0	39	6 <0.5 mm	NA	1.2846
2010 CR 300	OCS1	0	1	1 <0.5 mm	NA	1.2766
2010 Chinworth	OCS2	0	70	10 <0.5 mm	NA	1.2727
2009 20th Rd	OCS3	0 NA		8 <0.5 mm	NA	1.27
2010 Chinworth	OCS2	0	22	5 <0.5 mm	NA	1.256
2010 CR 100	CS1	1	65	8 <0.5 mm	NA	1.2503
2010 CR 300	OCS1	0	55	7 <0.5 mm	NA	1.2439
2009 Chinworth	OCS2	0 NA		4 <0.5 mm	NA	1.23
2009 Chinworth	OCS2	0 NA		1 <0.5 mm	NA	1.22
2010 Chinworth	OCS2	0	20	4 <0.5 mm	NA	1.1739
2009 CR 100	CS1	1 NA		5 <0.5 mm	NA	1.17
2010 CR 300	OCS1	0	25	4 <0.5 mm	NA	1.1421
2009 20th Rd	OCS3	0 NA		5 <0.5 mm	NA	1.14
2009 20th Rd	OCS3	0 NA		7 <0.5 mm	NA	1.14
2009 PWP	CS3	1 NA		12 <0.5 mm	NA	1.11
2009 PWP	CS3	1 NA		4 <0.5 mm	NA	1.09
2010 20th Rd	OCS3	0	37	9 <0.5 mm	NA	1.0662
2010 PWP	CS3	1	36	5 <0.5 mm	NA	1.0635
2009 CR 300	OCS1	0 NA		10 <0.5 mm	NA	1.06
2009 CR 100	CS1	1 NA		2 <0.5 mm	NA	1.03
2009 Chinworth	OCS2	0 NA		7 <0.5 mm	NA	1.03
2010 PWP	CS3	1	52	9 <0.5 mm	NA	1.0246
2010 PWP	CS3	1	31	4 <0.5 mm	NA	1.0203
2009 CR 100	CS1	1 NA		8 <0.5 mm	NA	0.99
2010 CR 300	OCS1	0	61	9 <0.5 mm	NA	0.9858
2010 PWP	CS3	1	64	10 <0.5 mm	NA	0.9723
2010 CR 300	OCS1	0	43	5 <0.5 mm	NA	0.9589
2009 CR 100	CS1	1 NA		4 <0.5 mm	NA	0.95
2009 CR 700	CS2	1 NA		2 <0.5 mm	NA	0.95
2009 20th Rd	OCS3	0 NA		1 <0.5 mm	NA	0.95
2009 PWP	CS3	1 NA		2 <0.5 mm	NA	0.94
2010 PWP	CS3	1	26	2 <0.5 mm	NA	0.9257

2009 CR 100	CS1	1	NA	3 <0.5 mm	NA	0.92
2010 PWP	CS3	1	17	1 <0.5 mm	NA	0.9197
2009 CR 100	CS1	1	NA	6 <0.5 mm	NA	0.91
2010 PWP	CS3	1	40	7 <0.5 mm	NA	0.8942
2009 20th Rd	OCS3	0	NA	2 <0.5 mm	NA	0.87
2010 PWP	CS3	1	47	8 <0.5 mm	NA	0.8533
2009 CR 100	CS1	1	NA	7 <0.5 mm	NA	0.85
2009 20th Rd	OCS3	0	NA	10 <0.5 mm	NA	0.85
2009 Chinworth	OCS2	0	NA	3 <0.5 mm	NA	0.82
2010 CR 300	OCS1	0	56	8 <0.5 mm	NA	0.7406
2009 PWP	CS3	1	NA	8 <0.5 mm	NA	0.74
2010 CR 300	OCS1	0	44	6 <0.5 mm	NA	0.7013
2010 CR 300	OCS1	0	19	3 <0.5 mm	NA	0.6357
2009 PWP	CS3	1	NA	5 <0.5 mm	NA	0.63
2010 CR 300	OCS1	0	71	10 <0.5 mm	NA	0.6238
2009 PWP	CS3	1	NA	9 <0.5 mm	NA	0.6
2009 PWP	CS3	1	NA	10 <0.5 mm	NA	0.6
2010 CR 300	OCS1	0	7	2 <0.5 mm	NA	0.5616
2009 CR 700	CS2	1	NA	5 <0.5 mm	NA	0.55
2009 PWP	CS3	1	NA	6 <0.5 mm	NA	0.55
2009 PWP	CS3	1	NA	11 <0.5 mm	NA	0.54
2009 PWP	CS3	1	NA	3 <0.5 mm	NA	0.36
2009 PWP	CS3	1	NA	7 <0.5 mm	NA	0.36
2009 CR 700	CS2	1	NA	7 >2 mm	NA	NA
2009 PWP	CS3	1	NA	1 >2 mm	NA	4.73
2009 CR 100	CS1	1	NA	7 >2 mm	NA	4.7
2009 PWP	CS3	1	NA	8 >2 mm	NA	4.29
2009 PWP	CS3	1	NA	7 >2 mm	NA	4.27
2009 Chinworth	OCS2	0	NA	4 >2 mm	NA	3.94
2010 Chinworth	OCS2	0	67	9 >2 mm	NA	3.2395
2009 CR 700	CS2	1	NA	5 >2 mm	NA	3.04
2009 PWP	CS3	1	NA	9 >2 mm	NA	2.85
2009 PWP	CS3	1	NA	10 >2 mm	NA	2.55
2009 PWP	CS3	1	NA	13 >2 mm	NA	2.17
2009 Chinworth	OCS2	0	NA	6 >2 mm	NA	2.11
2010 Chinworth	OCS2	0	6	2 >2 mm	NA	2.09
2009 Chinworth	OCS2	0	NA	10 >2 mm	NA	1.98
2009 CR 700	CS2	1	NA	2 >2 mm	NA	1.98
2010 Chinworth	OCS2	0	39	6 >2 mm	NA	1.9707
2010 PWP	CS3	1	38	6 >2 mm	NA	1.896
2010 Chinworth	OCS2	0	13	3 >2 mm	NA	1.8868
2010 Chinworth	OCS2	0	60	7 >2 mm	NA	1.8861
2010 PWP	CS3	1	28	3 >2 mm	NA	1.8753
2010 Chinworth	OCS2	0	70	10 >2 mm	NA	1.8286
2010 PWP	CS3	1	47	8 >2 mm	NA	1.8255
2009 Chinworth	OCS2	0	NA	1 >2 mm	NA	1.81
2010 CR 700	CS2	1	35	6 >2 mm	NA	1.7851

2009 Chinworth	OCS2	0	NA	8 >2 mm	NA	1.78
2009 CR 100	CS1	1	NA	4 >2 mm	NA	1.77
2009 20th Rd	OCS3	0	NA	1 >2 mm	NA	1.74
2010 PWP	CS3	1	26	2 >2 mm	NA	1.7382
2010 CR 700	CS2	1	63	9 >2 mm	NA	1.7352
2010 CR 700	CS2	1	27	3 >2 mm	NA	1.7247
2009 PWP	CS3	1	NA	12 >2 mm	NA	1.72
2010 CR 700	CS2	1	57	8 >2 mm	NA	1.7105
2010 Chinworth	OCS2	0	4	1 >2 mm	NA	1.6965
2010 20th Rd	OCS3	0	18	4 >2 mm	NA	1.6803
2009 20th Rd	OCS3	0	NA	3 >2 mm	NA	1.68
2009 Chinworth	OCS2	0	NA	3 >2 mm	NA	1.66
2010 CR 300	OCS1	0	1	1 >2 mm	NA	1.6494
2010 Chinworth	OCS2	0	20	4 >2 mm	NA	1.5898
2010 PWP	CS3	1	36	5 >2 mm	NA	1.5477
2010 20th Rd	OCS3	0	23	5 >2 mm	NA	1.5287
2009 PWP	CS3	1	NA	3 >2 mm	NA	1.5
2010 Chinworth	OCS2	0	62	8 >2 mm	NA	1.491
2009 20th Rd	OCS3	0	NA	7 >2 mm	NA	1.49
2009 CR 700	CS2	1	NA	1 >2 mm	NA	1.48
2009 Chinworth	OCS2	0	NA	5 >2 mm	NA	1.47
2009 PWP	CS3	1	NA	6 >2 mm	NA	1.46
2009 20th Rd	OCS3	0	NA	10 >2 mm	NA	1.44
2009 PWP	CS3	1	NA	2 >2 mm	NA	1.42
2009 CR 300	OCS1	0	NA	8 >2 mm	NA	1.4
2010 20th Rd	OCS3	0	29	6 >2 mm	NA	1.387
2010 PWP	CS3	1	52	9 >2 mm	NA	1.384
2010 PWP	CS3	1	64	10 >2 mm	NA	1.3806
2010 PWP	CS3	1	31	4 >2 mm	NA	1.3784
2010 20th Rd	OCS3	0	30	7 >2 mm	NA	1.3755
2010 PWP	CS3	1	40	7 >2 mm	NA	1.3671
2009 CR 100	CS1	1	NA	3 >2 mm	NA	1.36
2010 CR 700	CS2	1	24	2 >2 mm	NA	1.354
2009 CR 100	CS1	1	NA	5 >2 mm	NA	1.34
2009 CR 300	OCS1	0	NA	10 >2 mm	NA	1.33
2009 20th Rd	OCS3	0	NA	8 >2 mm	NA	1.33
2009 CR 300	OCS1	0	NA	5 >2 mm	NA	1.31
2009 Chinworth	OCS2	0	NA	9 >2 mm	NA	1.3
2010 CR 700	CS2	1	45	7 >2 mm	NA	1.2902
2009 CR 300	OCS1	0	NA	6 >2 mm	NA	1.29
2009 Chinworth	OCS2	0	NA	2 >2 mm	NA	1.29
2009 PWP	CS3	1	NA	5 >2 mm	NA	1.29
2010 CR 700	CS2	1	33	5 >2 mm	NA	1.2826
2009 CR 100	CS1	1	NA	6 >2 mm	NA	1.27
2009 CR 300	OCS1	0	NA	3 >2 mm	NA	1.27
2009 CR 300	OCS1	0	NA	2 >2 mm	NA	1.26
2009 CR 700	CS2	1	NA	3 >2 mm	NA	1.26

2010 CR 100	CS1	1	59	7 >2 mm	NA	1.2522
2010 CR 700	CS2	1	15	1 >2 mm	NA	1.2449
2010 Chinworth	OCS2	0	22	5 >2 mm	NA	1.2413
2009 CR 700	CS2	1 NA		4 >2 mm	NA	1.22
2009 20th Rd	OCS3	0 NA		2 >2 mm	NA	1.22
2009 PWP	CS3	1 NA		11 >2 mm	NA	1.19
2009 20th Rd	OCS3	0 NA		6 >2 mm	NA	1.19
2009 CR 100	CS1	1 NA		2 >2 mm	NA	1.18
2010 CR 300	OCS1	0	55	7 >2 mm	NA	1.1784
2009 20th Rd	OCS3	0 NA		9 >2 mm	NA	1.17
2010 CR 100	CS1	1	5	1 >2 mm	NA	1.1658
2010 CR 100	CS1	1	54	6 >2 mm	NA	1.1623
2010 20th Rd	OCS3	0	34	8 >2 mm	NA	1.1618
2010 20th Rd	OCS3	0	16	3 >2 mm	NA	1.1431
2009 20th Rd	OCS3	0 NA		4 >2 mm	NA	1.14
2010 20th Rd	OCS3	0	3	1 >2 mm	NA	1.1295
2010 CR 700	CS2	1	32	4 >2 mm	NA	1.1294
2010 CR 300	OCS1	0	44	6 >2 mm	NA	1.1252
2009 CR 700	CS2	1 NA		6 >2 mm	NA	1.11
2010 CR 300	OCS1	0	7	2 >2 mm	NA	1.1061
2010 CR 300	OCS1	0	56	8 >2 mm	NA	1.1048
2010 20th Rd	OCS3	0	14	2 >2 mm	NA	1.0979
2009 Chinworth	OCS2	0 NA		7 >2 mm	NA	1.09
2009 CR 300	OCS1	0 NA		1 >2 mm	NA	1.08
2010 CR 100	CS1	1	65	8 >2 mm	NA	1.0787
2010 CR 300	OCS1	0	25	4 >2 mm	NA	1.0743
2009 CR 100	CS1	1 NA		8 >2 mm	NA	1.06
2010 CR 700	CS2	1	66	10 >2 mm	NA	1.0587
2010 20th Rd	OCS3	0	37	9 >2 mm	NA	1.0519
2010 PWP	CS3	1	17	1 >2 mm	NA	1.0517
2010 CR 300	OCS1	0	61	9 >2 mm	NA	1.0371
2010 CR 100	CS1	1	8	2 >2 mm	NA	1.0328
2009 20th Rd	OCS3	0 NA		5 >2 mm	NA	1
2010 CR 300	OCS1	0	19	3 >2 mm	NA	0.9936
2009 CR 300	OCS1	0 NA		4 >2 mm	NA	0.99
2010 CR 100	CS1	1	53	5 >2 mm	NA	0.9712
2010 CR 300	OCS1	0	43	5 >2 mm	NA	0.9601
2010 CR 100	CS1	1	21	4 >2 mm	NA	0.9264
2009 CR 300	OCS1	0 NA		7 >2 mm	NA	0.92
2010 CR 300	OCS1	0	71	10 >2 mm	NA	0.911
2010 CR 100	CS1	1	11	3 >2 mm	NA	0.8998
2010 CR 100	CS1	1	68	9 >2 mm	NA	0.8813
2009 CR 100	CS1	1 NA		1 >2 mm	NA	0.86
2009 CR 300	OCS1	0 NA		9 >2 mm	NA	0.84
2009 PWP	CS3	1 NA		4 >2 mm	NA	0
2009 CR 700	CS2	1 NA		7 0.5-1 mm	NA	NA
2009 Chinworth	OCS2	0 NA		6 0.5-1 mm	NA	NA

2010 CR 700	CS2	1	35	6 0.5-1 mm	NA	5.6904
2009 Chinworth	OCS2	0	NA	4 0.5-1 mm	NA	5
2009 Chinworth	OCS2	0	NA	5 0.5-1 mm	NA	4.99
2010 CR 700	CS2	1	33	5 0.5-1 mm	NA	4.7229
2010 CR 700	CS2	1	27	3 0.5-1 mm	NA	4.3677
2009 CR 300	OCS1	0	NA	7 0.5-1 mm	NA	4.2
2010 CR 300	OCS1	0	1	1 0.5-1 mm	NA	3.7383
2009 20th Rd	OCS3	0	NA	8 0.5-1 mm	NA	3.7
2009 CR 700	CS2	1	NA	3 0.5-1 mm	NA	3.62
2010 CR 700	CS2	1	32	4 0.5-1 mm	NA	3.5856
2009 CR 300	OCS1	0	NA	6 0.5-1 mm	NA	3.55
2010 CR 700	CS2	1	24	2 0.5-1 mm	NA	3.5259
2010 CR 700	CS2	1	15	1 0.5-1 mm	NA	3.4565
2009 Chinworth	OCS2	0	NA	8 0.5-1 mm	NA	3.28
2010 CR 700	CS2	1	57	8 0.5-1 mm	NA	3.2552
2010 CR 100	CS1	1	5	1 0.5-1 mm	NA	3.2415
2009 CR 100	CS1	1	NA	7 0.5-1 mm	NA	3.21
2010 PWP	CS3	1	28	3 0.5-1 mm	NA	3.1936
2010 CR 100	CS1	1	21	4 0.5-1 mm	NA	3.1191
2009 Chinworth	OCS2	0	NA	1 0.5-1 mm	NA	3.11
2010 CR 700	CS2	1	45	7 0.5-1 mm	NA	3.0704
2009 CR 300	OCS1	0	NA	8 0.5-1 mm	NA	3.02
2010 CR 700	CS2	1	63	9 0.5-1 mm	NA	3.0069
2009 CR 300	OCS1	0	NA	9 0.5-1 mm	NA	3
2009 CR 100	CS1	1	NA	3 0.5-1 mm	NA	2.99
2010 CR 700	CS2	1	66	10 0.5-1 mm	NA	2.9674
2010 CR 100	CS1	1	68	9 0.5-1 mm	NA	2.9003
2009 CR 700	CS2	1	NA	6 0.5-1 mm	NA	2.79
2010 PWP	CS3	1	38	6 0.5-1 mm	NA	2.767
2009 Chinworth	OCS2	0	NA	10 0.5-1 mm	NA	2.76
2009 20th Rd	OCS3	0	NA	9 0.5-1 mm	NA	2.73
2010 20th Rd	OCS3	0	29	6 0.5-1 mm	NA	2.7195
2010 Chinworth	OCS2	0	67	9 0.5-1 mm	NA	2.6745
2009 20th Rd	OCS3	0	NA	3 0.5-1 mm	NA	2.63
2010 CR 100	CS1	1	54	6 0.5-1 mm	NA	2.6218
2010 CR 100	CS1	1	59	7 0.5-1 mm	NA	2.5326
2009 PWP	CS3	1	NA	1 0.5-1 mm	NA	2.51
2009 CR 300	OCS1	0	NA	4 0.5-1 mm	NA	2.4
2010 20th Rd	OCS3	0	14	2 0.5-1 mm	NA	2.3902
2009 20th Rd	OCS3	0	NA	6 0.5-1 mm	NA	2.39
2009 CR 700	CS2	1	NA	1 0.5-1 mm	NA	2.36
2009 PWP	CS3	1	NA	2 0.5-1 mm	NA	2.35
2010 CR 300	OCS1	0	25	4 0.5-1 mm	NA	2.3483
2010 20th Rd	OCS3	0	3	1 0.5-1 mm	NA	2.2178
2009 Chinworth	OCS2	0	NA	2 0.5-1 mm	NA	2.11
2009 CR 700	CS2	1	NA	4 0.5-1 mm	NA	2.09
2010 CR 300	OCS1	0	43	5 0.5-1 mm	NA	2.0753

2010 20th Rd	OCS3	0	23	5 0.5-1 mm	NA	2.0527
2009 CR 100	CS1	1 NA		1 0.5-1 mm	NA	2.05
2010 CR 100	CS1	1	53	5 0.5-1 mm	NA	2.0027
2009 CR 100	CS1	1 NA		4 0.5-1 mm	NA	2
2010 20th Rd	OCS3	0	30	7 0.5-1 mm	NA	1.9868
2010 Chinworth	OCS2	0	13	3 0.5-1 mm	NA	1.9689
2009 20th Rd	OCS3	0 NA		1 0.5-1 mm	NA	1.96
2010 PWP	CS3	1	36	5 0.5-1 mm	NA	1.94
2009 CR 300	OCS1	0 NA		5 0.5-1 mm	NA	1.93
2010 Chinworth	OCS2	0	60	7 0.5-1 mm	NA	1.9178
2009 Chinworth	OCS2	0 NA		9 0.5-1 mm	NA	1.91
2009 20th Rd	OCS3	0 NA		4 0.5-1 mm	NA	1.87
2010 Chinworth	OCS2	0	6	2 0.5-1 mm	NA	1.8521
2010 Chinworth	OCS2	0	22	5 0.5-1 mm	NA	1.845
2009 CR 700	CS2	1 NA		2 0.5-1 mm	NA	1.83
2010 PWP	CS3	1	31	4 0.5-1 mm	NA	1.8244
2009 CR 100	CS1	1 NA		2 0.5-1 mm	NA	1.81
2009 CR 100	CS1	1 NA		5 0.5-1 mm	NA	1.81
2010 Chinworth	OCS2	0	39	6 0.5-1 mm	NA	1.7909
2009 PWP	CS3	1 NA		4 0.5-1 mm	NA	1.76
2010 Chinworth	OCS2	0	70	10 0.5-1 mm	NA	1.7142
2010 PWP	CS3	1	64	10 0.5-1 mm	NA	1.7117
2009 CR 300	OCS1	0 NA		3 0.5-1 mm	NA	1.71
2009 CR 300	OCS1	0 NA		10 0.5-1 mm	NA	1.71
2010 PWP	CS3	1	52	9 0.5-1 mm	NA	1.6989
2010 Chinworth	OCS2	0	20	4 0.5-1 mm	NA	1.686
2010 Chinworth	OCS2	0	62	8 0.5-1 mm	NA	1.6689
2010 Chinworth	OCS2	0	4	1 0.5-1 mm	NA	1.6654
2010 CR 300	OCS1	0	19	3 0.5-1 mm	NA	1.6339
2010 CR 100	CS1	1	11	3 0.5-1 mm	NA	1.6272
2010 PWP	CS3	1	17	1 0.5-1 mm	NA	1.6017
2010 20th Rd	OCS3	0	18	4 0.5-1 mm	NA	1.576
2010 PWP	CS3	1	26	2 0.5-1 mm	NA	1.5739
2009 Chinworth	OCS2	0 NA		7 0.5-1 mm	NA	1.57
2009 CR 100	CS1	1 NA		6 0.5-1 mm	NA	1.56
2009 PWP	CS3	1 NA		8 0.5-1 mm	NA	1.56
2009 CR 300	OCS1	0 NA		1 0.5-1 mm	NA	1.55
2010 PWP	CS3	1	47	8 0.5-1 mm	NA	1.548
2010 CR 100	CS1	1	65	8 0.5-1 mm	NA	1.522
2009 PWP	CS3	1 NA		12 0.5-1 mm	NA	1.51
2009 PWP	CS3	1 NA		13 0.5-1 mm	NA	1.51
2009 20th Rd	OCS3	0 NA		5 0.5-1 mm	NA	1.51
2010 20th Rd	OCS3	0	16	3 0.5-1 mm	NA	1.4973
2009 CR 100	CS1	1 NA		8 0.5-1 mm	NA	1.48
2010 20th Rd	OCS3	0	34	8 0.5-1 mm	NA	1.4513
2009 20th Rd	OCS3	0 NA		2 0.5-1 mm	NA	1.44
2010 CR 100	CS1	1	8	2 0.5-1 mm	NA	1.4167

2009 CR 700	CS2	1	NA	5	0.5-1 mm	NA	1.4
2009 CR 300	OCS1	0	NA	2	0.5-1 mm	NA	1.39
2009 20th Rd	OCS3	0	NA	10	0.5-1 mm	NA	1.38
2009 20th Rd	OCS3	0	NA	7	0.5-1 mm	NA	1.37
2010 CR 300	OCS1	0	55	7	0.5-1 mm	NA	1.3511
2009 Chinworth	OCS2	0	NA	3	0.5-1 mm	NA	1.34
2010 20th Rd	OCS3	0	37	9	0.5-1 mm	NA	1.322
2010 CR 300	OCS1	0	61	9	0.5-1 mm	NA	1.3098
2010 PWP	CS3	1	40	7	0.5-1 mm	NA	1.2345
2010 CR 300	OCS1	0	56	8	0.5-1 mm	NA	1.1908
2009 PWP	CS3	1	NA	9	0.5-1 mm	NA	1.17
2009 PWP	CS3	1	NA	11	0.5-1 mm	NA	1.14
2009 PWP	CS3	1	NA	5	0.5-1 mm	NA	1.1
2010 CR 300	OCS1	0	44	6	0.5-1 mm	NA	1.0436
2009 PWP	CS3	1	NA	6	0.5-1 mm	NA	1.03
2009 PWP	CS3	1	NA	10	0.5-1 mm	NA	1
2010 CR 300	OCS1	0	71	10	0.5-1 mm	NA	0.9825
2010 CR 300	OCS1	0	7	2	0.5-1 mm	NA	0.9464
2009 PWP	CS3	1	NA	7	0.5-1 mm	NA	0.92
2009 PWP	CS3	1	NA	3	0.5-1 mm	NA	0.73
2009 CR 700	CS2	1	NA	7	1-2 mm	NA	NA
2009 Chinworth	OCS2	0	NA	4	1-2 mm	NA	NA
2009 Chinworth	OCS2	0	NA	6	1-2 mm	NA	NA
2009 CR 100	CS1	1	NA	7	1-2 mm	NA	5.22
2010 CR 300	OCS1	0	1	1	1-2 mm	NA	4.4802
2009 PWP	CS3	1	NA	1	1-2 mm	NA	4.15
2009 PWP	CS3	1	NA	8	1-2 mm	NA	3.98
2009 PWP	CS3	1	NA	4	1-2 mm	NA	3.42
2009 Chinworth	OCS2	0	NA	5	1-2 mm	NA	3.39
2009 Chinworth	OCS2	0	NA	8	1-2 mm	NA	3.14
2009 PWP	CS3	1	NA	13	1-2 mm	NA	3.12
2009 CR 700	CS2	1	NA	3	1-2 mm	NA	3.1
2009 Chinworth	OCS2	0	NA	1	1-2 mm	NA	3.04
2009 CR 700	CS2	1	NA	5	1-2 mm	NA	2.97
2009 PWP	CS3	1	NA	2	1-2 mm	NA	2.95
2009 PWP	CS3	1	NA	12	1-2 mm	NA	2.82
2010 Chinworth	OCS2	0	67	9	1-2 mm	NA	2.7708
2010 CR 100	CS1	1	5	1	1-2 mm	NA	2.7547
2009 20th Rd	OCS3	0	NA	1	1-2 mm	NA	2.74
2009 PWP	CS3	1	NA	9	1-2 mm	NA	2.66
2009 CR 700	CS2	1	NA	2	1-2 mm	NA	2.59
2009 Chinworth	OCS2	0	NA	10	1-2 mm	NA	2.51
2010 CR 700	CS2	1	24	2	1-2 mm	NA	2.5084
2009 CR 100	CS1	1	NA	1	1-2 mm	NA	2.5
2009 PWP	CS3	1	NA	10	1-2 mm	NA	2.5
2010 CR 700	CS2	1	35	6	1-2 mm	NA	2.4817
2009 CR 300	OCS1	0	NA	6	1-2 mm	NA	2.42

2009 CR 700	CS2	1	NA	1 1-2 mm	NA	2.38
2009 20th Rd	OCS3	0	NA	3 1-2 mm	NA	2.37
2009 CR 300	OCS1	0	NA	7 1-2 mm	NA	2.36
2010 20th Rd	OCS3	0	29	6 1-2 mm	NA	2.3293
2010 Chinworth	OCS2	0	20	4 1-2 mm	NA	2.3139
2010 PWP	CS3	1	28	3 1-2 mm	NA	2.2736
2010 CR 700	CS2	1	33	5 1-2 mm	NA	2.2448
2009 CR 300	OCS1	0	NA	4 1-2 mm	NA	2.19
2010 CR 700	CS2	1	63	9 1-2 mm	NA	2.186
2009 CR 300	OCS1	0	NA	8 1-2 mm	NA	2.16
2010 CR 300	OCS1	0	25	4 1-2 mm	NA	2.1522
2010 CR 700	CS2	1	45	7 1-2 mm	NA	2.1368
2009 Chinworth	OCS2	0	NA	9 1-2 mm	NA	2.1
2010 CR 100	CS1	1	54	6 1-2 mm	NA	2.0995
2010 20th Rd	OCS3	0	30	7 1-2 mm	NA	2.08
2010 CR 700	CS2	1	27	3 1-2 mm	NA	2.0794
2009 PWP	CS3	1	NA	7 1-2 mm	NA	2.07
2010 20th Rd	OCS3	0	18	4 1-2 mm	NA	2.0585
2009 CR 100	CS1	1	NA	4 1-2 mm	NA	2
2009 20th Rd	OCS3	0	NA	4 1-2 mm	NA	1.99
2010 PWP	CS3	1	52	9 1-2 mm	NA	1.9747
2010 PWP	CS3	1	17	1 1-2 mm	NA	1.9714
2009 CR 300	OCS1	0	NA	10 1-2 mm	NA	1.96
2009 20th Rd	OCS3	0	NA	9 1-2 mm	NA	1.96
2010 CR 700	CS2	1	32	4 1-2 mm	NA	1.9595
2010 Chinworth	OCS2	0	6	2 1-2 mm	NA	1.9378
2010 CR 100	CS1	1	59	7 1-2 mm	NA	1.9372
2010 CR 700	CS2	1	57	8 1-2 mm	NA	1.9187
2010 CR 300	OCS1	0	19	3 1-2 mm	NA	1.9131
2010 Chinworth	OCS2	0	70	10 1-2 mm	NA	1.9067
2010 Chinworth	OCS2	0	13	3 1-2 mm	NA	1.8845
2009 CR 100	CS1	1	NA	3 1-2 mm	NA	1.88
2010 Chinworth	OCS2	0	60	7 1-2 mm	NA	1.8749
2010 PWP	CS3	1	36	5 1-2 mm	NA	1.8693
2009 Chinworth	OCS2	0	NA	2 1-2 mm	NA	1.86
2009 Chinworth	OCS2	0	NA	3 1-2 mm	NA	1.86
2009 20th Rd	OCS3	0	NA	6 1-2 mm	NA	1.85
2010 PWP	CS3	1	31	4 1-2 mm	NA	1.8153
2009 CR 300	OCS1	0	NA	5 1-2 mm	NA	1.79
2009 CR 300	OCS1	0	NA	9 1-2 mm	NA	1.79
2010 PWP	CS3	1	26	2 1-2 mm	NA	1.7835
2009 20th Rd	OCS3	0	NA	5 1-2 mm	NA	1.76
2010 CR 100	CS1	1	21	4 1-2 mm	NA	1.741
2009 CR 300	OCS1	0	NA	1 1-2 mm	NA	1.74
2010 Chinworth	OCS2	0	4	1 1-2 mm	NA	1.739
2009 PWP	CS3	1	NA	5 1-2 mm	NA	1.73
2009 20th Rd	OCS3	0	NA	2 1-2 mm	NA	1.73

2010 CR 300	OCS1	0	56	8 1-2 mm	NA	1.7138
2009 CR 100	CS1	1 NA		2 1-2 mm	NA	1.71
2009 CR 700	CS2	1 NA		6 1-2 mm	NA	1.7
2009 CR 300	OCS1	0 NA		3 1-2 mm	NA	1.68
2010 CR 300	OCS1	0	43	5 1-2 mm	NA	1.6787
2010 Chinworth	OCS2	0	62	8 1-2 mm	NA	1.6719
2009 CR 700	CS2	1 NA		4 1-2 mm	NA	1.67
2009 20th Rd	OCS3	0 NA		7 1-2 mm	NA	1.63
2010 Chinworth	OCS2	0	22	5 1-2 mm	NA	1.6292
2010 CR 700	CS2	1	66	10 1-2 mm	NA	1.6149
2010 CR 700	CS2	1	15	1 1-2 mm	NA	1.5968
2010 20th Rd	OCS3	0	23	5 1-2 mm	NA	1.5963
2010 CR 100	CS1	1	11	3 1-2 mm	NA	1.5719
2009 Chinworth	OCS2	0 NA		7 1-2 mm	NA	1.56
2010 20th Rd	OCS3	0	14	2 1-2 mm	NA	1.5545
2009 PWP	CS3	1 NA		6 1-2 mm	NA	1.55
2009 CR 100	CS1	1 NA		5 1-2 mm	NA	1.54
2010 CR 300	OCS1	0	71	10 1-2 mm	NA	1.5399
2009 CR 100	CS1	1 NA		8 1-2 mm	NA	1.52
2010 CR 300	OCS1	0	44	6 1-2 mm	NA	1.5122
2010 CR 300	OCS1	0	55	7 1-2 mm	NA	1.4987
2010 20th Rd	OCS3	0	3	1 1-2 mm	NA	1.4916
2010 CR 100	CS1	1	68	9 1-2 mm	NA	1.464
2010 PWP	CS3	1	38	6 1-2 mm	NA	1.4409
2009 20th Rd	OCS3	0 NA		8 1-2 mm	NA	1.44
2010 Chinworth	OCS2	0	39	6 1-2 mm	NA	1.4208
2009 20th Rd	OCS3	0 NA		10 1-2 mm	NA	1.42
2009 PWP	CS3	1 NA		11 1-2 mm	NA	1.41
2010 CR 100	CS1	1	65	8 1-2 mm	NA	1.3987
2010 CR 100	CS1	1	53	5 1-2 mm	NA	1.3663
2010 20th Rd	OCS3	0	16	3 1-2 mm	NA	1.3542
2010 PWP	CS3	1	64	10 1-2 mm	NA	1.3416
2010 PWP	CS3	1	47	8 1-2 mm	NA	1.3359
2010 PWP	CS3	1	40	7 1-2 mm	NA	1.3067
2010 20th Rd	OCS3	0	37	9 1-2 mm	NA	1.2907
2009 CR 300	OCS1	0 NA		2 1-2 mm	NA	1.29
2009 CR 100	CS1	1 NA		6 1-2 mm	NA	1.28
2010 CR 300	OCS1	0	61	9 1-2 mm	NA	1.2763
2010 20th Rd	OCS3	0	34	8 1-2 mm	NA	1.2624
2009 PWP	CS3	1 NA		3 1-2 mm	NA	1.26
2010 CR 300	OCS1	0	7	2 1-2 mm	NA	1.2103
2010 CR 100	CS1	1	8	2 1-2 mm	NA	1.1972
2010 CR 700	CS2	1	35	6 TOTAL	18.23529	3.688198
2010 CR 700	CS2	1	27	3 TOTAL	20.05731	3.614941
2009 CR 300	OCS1	0 NA		6 TOTAL	21.57	3.59
2010 CR 700	CS2	1	33	5 TOTAL	22.50712	3.565953
2010 CR 700	CS2	1	24	2 TOTAL	23.46041	3.419973

2009 CR 300	OCS1	0	NA	9 TOTAL	13.75	3.31
2009 20th Rd	OCS3	0	NA	9 TOTAL	27.49	3.2
2010 CR 700	CS2	1	32	4 TOTAL	22.05714	2.932782
2009 Chinworth	OCS2	0	NA	5 TOTAL	23.32	2.91
2010 CR 700	CS2	1	45	7 TOTAL	19.72299	2.880011
2009 CR 300	OCS1	0	NA	8 TOTAL	17.52	2.79
2009 CR 700	CS2	1	NA	3 TOTAL	28.1	2.69
2010 CR 700	CS2	1	63	9 TOTAL	23.47826	2.679575
2010 CR 700	CS2	1	15	1 TOTAL	22.13018	2.650648
2010 20th Rd	OCS3	0	29	6 TOTAL	23.88571	2.472342
2010 CR 100	CS1	1	54	6 TOTAL	19.82857	2.438934
2010 CR 100	CS1	1	5	1 TOTAL	24.51429	2.422524
2010 CR 700	CS2	1	57	8 TOTAL	33.01136	2.415328
2009 Chinworth	OCS2	0	NA	6 TOTAL	29.67	2.3
2010 CR 100	CS1	1	59	7 TOTAL	15.6447	2.271954
2010 CR 100	CS1	1	21	4 TOTAL	17.14286	2.271446
2009 CR 700	CS2	1	NA	6 TOTAL	29.37	2.23
2010 20th Rd	OCS3	0	14	2 TOTAL	28.08451	2.194867
2009 CR 300	OCS1	0	NA	7 TOTAL	16.4	2.17
2009 PWP	CS3	1	NA	1 TOTAL	29.91	2.15
2010 CR 700	CS2	1	66	10 TOTAL	30.0578	2.135956
2010 CR 100	CS1	1	68	9 TOTAL	19.66667	2.051977
2010 20th Rd	OCS3	0	30	7 TOTAL	27.75862	1.974824
2010 Chinworth	OCS2	0	67	9 TOTAL	38.81081	1.974174
2010 CR 300	OCS1	0	1	1 TOTAL	21.28134	1.971914
2009 Chinworth	OCS2	0	NA	4 TOTAL	46.49	1.96
2009 CR 700	CS2	1	NA	4 TOTAL	33.71	1.94
2009 20th Rd	OCS3	0	NA	3 TOTAL	47.55	1.94
2010 20th Rd	OCS3	0	3	1 TOTAL	20.38781	1.936532
2009 CR 700	CS2	1	NA	1 TOTAL	44.88	1.93
2009 Chinworth	OCS2	0	NA	10 TOTAL	34.96	1.89
2010 PWP	CS3	1	28	3 TOTAL	30.43228	1.774014
2010 20th Rd	OCS3	0	23	5 TOTAL	27.67045	1.746954
2010 PWP	CS3	1	38	6 TOTAL	21.76796	1.746699
2009 Chinworth	OCS2	0	NA	8 TOTAL	45.02	1.74
2010 Chinworth	OCS2	0	4	1 TOTAL	31.96429	1.677692
2009 Chinworth	OCS2	0	NA	2 TOTAL	41.25	1.67
2010 Chinworth	OCS2	0	62	8 TOTAL	45.45714	1.662723
2009 Chinworth	OCS2	0	NA	1 TOTAL	37.81	1.64
2009 PWP	CS3	1	NA	13 TOTAL	29.26	1.64
2010 Chinworth	OCS2	0	13	3 TOTAL	36.63768	1.63281
2010 20th Rd	OCS3	0	18	4 TOTAL	31.79775	1.630441
2009 20th Rd	OCS3	0	NA	6 TOTAL	43.16	1.62
2009 CR 300	OCS1	0	NA	4 TOTAL	16.88	1.61
2009 CR 100	CS1	1	NA	1 TOTAL	19.9	1.6
2009 Chinworth	OCS2	0	NA	9 TOTAL	44.35	1.59
2009 CR 300	OCS1	0	NA	3 TOTAL	31.3	1.58

2010 Chinworth	OCS2	0	60	7 TOTAL	47.56598	1.578989
2010 CR 300	OCS1	0	25	4 TOTAL	26.43258	1.577599
2010 Chinworth	OCS2	0	6	2 TOTAL	43.56546	1.558507
2009 20th Rd	OCS3	0 NA		4 TOTAL	35.35	1.54
2009 CR 300	OCS1	0 NA		2 TOTAL	22.8	1.52
2009 20th Rd	OCS3	0 NA		8 TOTAL	39.69	1.51
2009 CR 300	OCS1	0 NA		1 TOTAL	28.58	1.48
2009 CR 700	CS2	1 NA		7 TOTAL	48.36	1.47
2010 Chinworth	OCS2	0	70	10 TOTAL	41.48571	1.469719
2010 CR 100	CS1	1	53	5 TOTAL	33.08571	1.469151
2010 Chinworth	OCS2	0	39	6 TOTAL	45.5	1.466096
2009 CR 300	OCS1	0 NA		5 TOTAL	28.41	1.45
2009 PWP	CS3	1 NA		2 TOTAL	32.97	1.45
2010 Chinworth	OCS2	0	20	4 TOTAL	40	1.442584
2009 CR 700	CS2	1 NA		2 TOTAL	41.94	1.44
2010 CR 100	CS1	1	11	3 TOTAL	30.17143	1.431562
2010 Chinworth	OCS2	0	22	5 TOTAL	41.30682	1.414817
2009 CR 100	CS1	1 NA		3 TOTAL	38.83	1.39
2010 20th Rd	OCS3	0	34	8 TOTAL	37.69863	1.374131
2010 20th Rd	OCS3	0	16	3 TOTAL	41.84438	1.371725
2009 PWP	CS3	1 NA		4 TOTAL	39.17	1.35
2009 CR 100	CS1	1 NA		5 TOTAL	29.38	1.34
2009 PWP	CS3	1 NA		8 TOTAL	48.62	1.32
2009 CR 100	CS1	1 NA		4 TOTAL	40.64	1.31
2009 20th Rd	OCS3	0 NA		1 TOTAL	38.72	1.31
2010 CR 100	CS1	1	65	8 TOTAL	31.72222	1.308807
2010 PWP	CS3	1	36	5 TOTAL	28.79552	1.305754
2009 20th Rd	OCS3	0 NA		5 TOTAL	35.12	1.3
2010 CR 300	OCS1	0	55	7 TOTAL	24.45055	1.298513
2009 20th Rd	OCS3	0 NA		7 TOTAL	56.85	1.29
2010 CR 100	CS1	1	8	2 TOTAL	24.63277	1.287147
2009 PWP	CS3	1 NA		12 TOTAL	45.59	1.28
2009 CR 300	OCS1	0 NA		10 TOTAL	51.45	1.27
2009 CR 100	CS1	1 NA		2 TOTAL	36.36	1.24
2010 PWP	CS3	1	52	9 TOTAL	32.27778	1.234288
2009 Chinworth	OCS2	0 NA		7 TOTAL	45.64	1.2
2009 20th Rd	OCS3	0 NA		2 TOTAL	36.44	1.19
2010 CR 300	OCS1	0	43	5 TOTAL	67.5	1.186913
2010 PWP	CS3	1	26	2 TOTAL	40.41176	1.169936
2009 CR 100	CS1	1 NA		8 TOTAL	38.28	1.16
2009 CR 100	CS1	1 NA		7 TOTAL	14.02	1.15
2010 PWP	CS3	1	31	4 TOTAL	35.01401	1.142749
2010 PWP	CS3	1	64	10 TOTAL	39.63889	1.14205
2009 CR 100	CS1	1 NA		6 TOTAL	38.82	1.14
2010 20th Rd	OCS3	0	37	9 TOTAL	46	1.135138
2009 Chinworth	OCS2	0 NA		3 TOTAL	58.42	1.13
2010 CR 300	OCS1	0	61	9 TOTAL	32.68571	1.11064

2010 PWP	CS3	1	47	8 TOTAL	32.83333	1.106406
2010 PWP	CS3	1	17	1 TOTAL	34.03727	1.104921
2009 20th Rd	OCS3	0 NA		10 TOTAL	34.77	1.1
2009 PWP	CS3	1 NA		9 TOTAL	46.6	1.01
2010 PWP	CS3	1	40	7 TOTAL	33.77143	1.004529
2010 CR 300	OCS1	0	44	6 TOTAL	33.46154	0.964944
2009 PWP	CS3	1 NA		10 TOTAL	46.78	0.96
2009 CR 700	CS2	1 NA		5 TOTAL	48	0.95
2010 CR 300	OCS1	0	56	8 TOTAL	42.12534	0.941024
2010 CR 300	OCS1	0	19	3 TOTAL	39.09357	0.901414
2010 CR 300	OCS1	0	71	10 TOTAL	29.41176	0.822952
2009 PWP	CS3	1 NA		11 TOTAL	35.49	0.81
2009 PWP	CS3	1 NA		5 TOTAL	44.02	0.79
2009 PWP	CS3	1 NA		6 TOTAL	47.91	0.77
2009 PWP	CS3	1 NA		3 TOTAL	37.94	0.76
2010 CR 300	OCS1	0	7	2 TOTAL	34.76744	0.759116
2009 PWP	CS3	1 NA		7 TOTAL	48.33	0.61

Draft

Sed_Rate_1	Sed_Rate_2	OM_sed.ra	rank
2.665174	1.044286	NA	1
1.125929	0.487671	55.7096	1
1.090962	0.482192	51.4452	1
1.03547	0.465753	47.3808	1
0.715978	0.293421	32.12895	6
0.948852	0.410959	42.1301	1
0.98317	0.421918	41.6096	1
0.776404	0.331507	32.8	1
1.332479	0.551316	54.94868	6
0.947064	0.394521	38.5438	1
2.364006	0.946377	83.00145	4
0.609153	0.253012	20.5446	3
1.111286	0.39726	37.2671	1
0.912808	0.39726	29.4863	1
0.920012	0.381579	28.95789	6
0.547231	0.214458	17.1843	3
1.419236	0.611429	38.90429	1
1.334248	0.545205	36.3575	1
1.698093	0.714286	45.64	4
1.550049	0.691304	40.26232	5
1.803427	0.71	45.04429	1
0.693288	0.277108	17.2169	3
1.318654	0.532857	32.31857	1
2.360167	0.971429	55.6771	4
1.043849	0.421687	24.5627	3
1.550725	0.643373	36.1337	3
1.313667	0.542857	29.4871	4
1.608476	0.671429	35.3329	4
1.103937	0.443421	22.48947	6
0.826409	0.342105	15.23158	6
2.445123	1.115385	43.20769	2
2.856152	1.566667	50.27246	4
1.800006	0.751429	31.6643	4
1.659496	0.698571	28.27714	1
2.879549	1.253012	48.4855	5
2.745267	1.098551	46.07971	5
2.876057	1.224096	48.3072	5
1.90449	0.79759	31.7012	5
2.713138	1.07971	44.97971	5
1.063036	0.405263	17.06711	6
1.334012	0.539474	21.02763	6
3.188887	1.290385	50.48846	2
1.938751	0.802817	30.4761	2
2.869728	1.207246	44.64058	5
2.28911	0.954286	35.3957	4
2.804645	1.183099	43.2563	2

1.664308	0.66988	24.712	3
3.740097	1.507246	55.05652	5
2.99159	1.230435	43.95652	5
2.919455	1.230435	42.93623	4
1.323701	0.552632	19.28947	6
1.151987	0.447368	16.50395	3
3.029229	1.289157	42.7169	5
2.061798	0.86747	28.794	5
3.356396	1.351429	46.6929	4
3.037149	1.185714	42.2457	4
2.108261	0.837681	29.26957	4
2.873276	1.216867	39.1289	5
1.543207	0.645783	20.8988	3
1.787705	0.736842	23.76447	6
1.149423	0.457831	15.1627	3
2.762307	1.13012	35.4855	5
1.489296	0.619048	19.0131	6
2.604153	1.084337	33.1434	5
2.428817	0.942029	30.83333	4
2.491298	1.036145	31.2904	5
1.689873	0.703614	21.1289	3
1.301726	0.547619	16.1917	6
3.917009	1.608696	48.31884	5
2.998654	1.236232	36.67826	5
2.40926	1.038554	28.2831	5
1.895128	0.773684	22.14	3
1.35318	0.559524	15.4548	6
2.473757	0.934783	28.20145	4
3.528945	1.414493	40.32029	4
4.82006	1.898077	53.67885	2
4.103446	1.692308	44.69615	2
3.167437	1.308571	33.7714	4
2.283241	0.926761	24.2831	2
3.558417	1.427632	37.84342	6
2.101572	0.842105	8.493421	3
3.065816	1.247826	31.71884	5
2.602841	1.15493	26.6676	2
3.582923	1.470423	36.5549	2
2.02812	0.809211	20.09605	3
1.800764	0.754762	17.7524	6
3.351852	1.343662	32.5915	2
1.784663	0.738095	17.1131	6
2.513879	1.019737	23.91579	3
2.604917	1.064286	24.77143	1
2.856726	1.189855	27.13188	4
3.081848	1.269231	29.075	2
3.194249	1.309859	29.5704	2

2.345792	0.973684	21.55395	3
2.758313	1.121127	25.3676	2
1.978641	0.782895	17.97763	3
2.878268	1.188732	25.738	2
1.579542	0.77971	13.68116	4
2.543955	1.042254	21.707	2
1.343021	0.519737	11.48026	3
2.077893	0.821739	17.68551	4
3.10347	1.3	25.43913	5
2.724977	1.154762	20.181	6
2.791452	1.102597	20.56234	2
1.523671	0.619048	10.6857	6
2.82911	1.136905	17.9845	6
5.584052	2.228846	35.06923	2
1.701633	0.738095	10.6143	6
2.354568	0.992208	14.12727	2
2.227255	0.874026	13.38442	2
1.896806	0.797619	10.6524	6
3.663546	1.497143	19.99	1
5.230292	2.036538	28.93462	2
3.604708	1.394231	10.08654	2
2.661679	1.086538	9.526923	2
4.736323	1.921154	17.17885	2
0.757746	0.315714	NA	1
0.017121	0.028846	0.809615	2
0.011816	0.006579	0.555263	3
0.076934	0.025974	3.301299	2
0.02605	0.019231	1.111538	2
0.089654	0.043478	3.534783	5
0.093908	0.040964	3.0422	5
0.140454	0.064286	4.268571	1
0.05129	0.022727	1.45974	2
0.045495	0.019481	1.161039	2
0.013994	0.009615	0.303846	2
0.060749	0.028986	1.281159	5
0.268871	0.108434	5.6193	5
0.159546	0.072464	3.15942	5
0.346047	0.15	6.842857	1
0.406135	0.168675	8.0036	5
0.136311	0.059155	2.5845	2
0.310464	0.127711	5.8578	5
0.228878	0.093976	4.3169	5
0.123397	0.050704	2.3141	2
0.294064	0.118072	5.3771	5
0.352751	0.143662	6.4394	2
0.147772	0.065217	2.669565	5
0.499181	0.19726	8.911	1

0.119854	0.057971	2.136232	5
0.408107	0.171053	7.218421	3
0.163823	0.065217	2.843478	4
0.34681	0.140845	6.0282	2
0.666073	0.268493	11.5575	1
0.383875	0.142466	6.6205	1
0.017094	0.019231	0.294231	2
0.829766	0.334247	14.1932	1
0.26276	0.103614	4.4578	5
0.415137	0.162857	6.9757	4
0.575142	0.231884	9.656522	4
0.343728	0.144928	5.711594	5
0.137282	0.052381	2.2643	6
0.255083	0.108434	4.0554	5
0.241976	0.101408	3.7451	2
0.558663	0.225714	8.54	4
0.721133	0.298077	10.78269	2
0.339952	0.138554	5.0687	5
0.86662	0.34058	12.88551	4
0.972087	0.41	14.39714	1
0.190559	0.07971	2.801449	5
0.449292	0.182692	6.553846	2
0.48131	0.188406	6.928986	4
0.281871	0.115385	3.990385	2
0.181509	0.072368	2.536842	6
0.393141	0.154286	5.4529	4
0.144914	0.059155	2.0056	2
0.341558	0.142254	4.7155	2
0.086549	0.03662	1.193	2
0.688456	0.274286	9.47	4
0.229851	0.090141	3.1423	2
0.348751	0.144737	4.75	3
0.480777	0.191781	6.5096	1
0.128178	0.052632	1.72	3
0.337683	0.144737	4.480263	6
0.483454	0.26087	6.415942	4
0.276964	0.105263	3.622368	6
0.259817	0.115942	3.365217	5
0.526947	0.20274	6.7986	1
0.192204	0.065789	2.471053	6
0.304483	0.057971	3.928986	5
0.292983	0.115385	3.792308	2
0.581763	0.230137	7.4616	1
0.337764	0.138158	4.278947	3
0.368712	0.164474	4.685526	6
0.418843	0.164474	5.277632	6
0.47907	0.192857	6.055714	1

0.451728	0.166265	5.6566	3
0.647904	0.252055	8.0658	1
0.370959	0.146988	4.6048	5
0.733994	0.292857	8.921429	1
0.615671	0.246377	7.497101	4
0.57276	0.230769	6.828846	2
0.368458	0.144928	4.392754	4
0.430226	0.177632	5.077632	3
0.190327	0.07381	2.2429	6
0.149874	0.065217	1.753623	4
0.229631	0.096386	2.6771	3
0.393171	0.178313	4.5699	3
0.30728	0.122857	3.57	4
0.708224	0.28	8.0957	4
0.629641	0.246377	7.188406	4
0.4414	0.174286	4.9857	4
0.557579	0.221918	6.2973	1
0.486893	0.2	5.4786	6
0.42169	0.164286	4.694286	1
0.140671	0.057143	1.556	6
0.210014	0.083333	2.3202	6
0.257124	0.1	2.8229	4
0.307197	0.130435	3.346377	5
0.318912	0.125	3.443421	6
0.413712	0.163855	4.4627	3
0.241025	0.119048	2.5893	6
0.392891	0.157895	4.159211	3
0.957337	0.39726	10.1356	1
0.820036	0.328571	8.6257	4
0.210396	0.084507	2.2127	2
0.204906	0.083333	2.125	6
0.350653	0.139759	3.6217	3
0.549078	0.213768	5.492754	4
0.134795	0.052381	1.3393	6
0.35877	0.138158	3.539474	6
0.582319	0.233735	5.6554	3
0.283577	0.109524	2.7226	6
0.202881	0.079518	1.8795	3
0.153743	0.065789	1.417105	6
0.161914	0.066667	1.475	6
0.219864	0.086747	1.9783	3
0.33973	0.137349	2.994	3
0.225566	0.092105	1.931579	3
0.193714	0.072368	1.626316	6
0.008833	0.009615	0	2
1.209046	0.502857	NA	1
0.206075	0.101449	NA	5

0.356285	0.164384	20.274	1
0.38848	0.181159	19.43478	5
0.310957	0.152174	15.53043	5
0.348782	0.150685	16.4726	1
0.434475	0.19726	18.9767	1
0.152866	0.065789	6.422368	6
0.390427	0.166667	14.5952	6
0.321772	0.297101	11.89565	4
0.462524	0.221429	16.75571	1
0.423307	0.191781	15.1781	1
0.271184	0.118421	9.635526	6
0.453315	0.205479	15.9836	1
0.441113	0.186301	15.247	1
0.47173	0.192754	15.49275	5
0.722726	0.328767	23.526	1
0.409258	0.168675	13.2663	3
0.106571	0.039474	3.419737	3
0.376369	0.169014	12.0197	2
0.307669	0.260241	9.5964	3
0.567759	0.246377	17.63043	5
0.396229	0.180822	12.1658	1
0.286762	0.131579	8.659211	6
0.605192	0.252055	18.1973	1
0.245647	0.111842	7.357895	6
0.578578	0.263158	17.32763	3
0.585447	0.260274	17.3726	1
0.352773	0.144578	10.2313	3
0.495531	0.214286	13.85	1
0.381555	0.169014	10.5577	2
0.50919	0.231884	14.07101	5
0.363403	0.15942	9.907246	4
0.440893	0.185714	11.99	4
0.705994	0.313253	18.8819	5
0.685662	0.27971	18.06232	4
0.485827	0.192771	12.7373	3
0.333249	0.144578	8.4398	3
1.076348	0.467308	26.97885	2
0.140622	0.059211	3.377632	6
0.504027	0.228571	12.0471	4
0.637123	0.257971	15.22609	4
0.803536	0.335714	18.93571	1
0.811331	0.375	19.06731	2
0.687218	0.297619	16.1381	6
0.411274	0.185714	9.1214	4
0.827238	0.34058	17.45652	5
0.708287	0.304286	14.83857	1
0.409056	0.178571	8.4893	6

0.536307	0.242857	11.0086	4
0.304116	0.111842	6.230263	3
0.606155	0.253012	12.1398	3
0.610614	0.256579	12.23421	3
0.576147	0.242857	11.4471	4
0.824936	0.349398	16.2422	5
0.686878	0.273913	13.48841	4
0.46799	0.197183	9.0789	2
0.358859	0.144737	6.910526	6
0.885161	0.373494	16.9759	5
0.700359	0.297101	13.36522	5
0.797532	0.314493	14.87971	4
0.861845	0.361446	15.9627	5
0.780833	0.325301	14.406	5
1.010319	0.425714	18.47571	1
0.409628	0.169014	7.4732	2
0.469682	0.269737	8.493421	3
0.599466	0.25	10.82	3
0.99528	0.409639	17.8241	5
1.7273	0.726923	30.33462	2
0.844305	0.361446	14.4735	5
0.671777	0.301408	11.4986	2
0.616914	0.289474	10.54605	6
0.721087	0.315789	12.35	6
0.58133	0.239437	9.8761	2
0.810867	0.349398	13.6711	5
0.822619	0.349398	13.7289	5
0.693196	0.216867	11.5446	5
0.717589	0.309524	11.725	6
0.910193	0.373494	14.8108	3
0.479782	0.197183	7.6845	2
0.711841	0.3	11.2186	4
0.629807	0.267606	9.9127	2
0.960733	0.392754	15.04493	5
0.777817	0.322368	12.16842	3
1.303687	0.538961	20.29481	2
0.563678	0.243421	8.734211	6
0.618245	0.267606	9.5704	2
0.675012	0.277108	10.2735	3
1.79076	0.738462	27.12308	2
1.172892	0.473077	17.70769	2
1.058219	0.410145	15.97971	4
0.904843	0.371429	13.5486	4
0.680225	0.296053	10.08553	3
0.758509	0.314286	11.0086	4
0.543155	0.228261	7.821739	4
0.687347	0.289157	9.7373	3

1.342763	0.592857	18.74571	1
0.484846	0.197368	6.739474	6
0.608094	0.26087	8.392754	4
1.137007	0.478261	15.55797	4
0.688504	0.297619	9.3024	6
1.161467	0.568116	15.58116	5
1.020404	0.414286	13.49	4
0.947914	0.392857	12.4155	6
0.500645	0.211268	6.1803	2
1.094698	0.47619	13.0357	6
1.471774	0.594805	17.27143	2
0.888573	0.346154	10.08654	2
0.892765	0.346154	9.784615	2
1.098161	0.452381	11.4607	6
1.025588	0.403846	10.6	2
1.843709	0.711688	18.4013	2
0.799571	0.333333	7.856	6
1.115112	0.464286	10.5536	6
2.102171	0.851923	19.40577	2
1.156546	0.451923	8.388462	2
1.046401	0.43	NA	1
0.197443	0.113043	NA	5
0.088661	0.043478	NA	5
0.034714	0.013158	1.813158	3
0.155526	0.071429	6.9679	6
0.254452	0.194231	10.55	2
0.415308	0.188312	16.52597	2
0.193215	0.086538	6.617308	2
0.207158	0.086957	7.027536	5
0.201407	0.094203	6.323188	5
0.212181	0.105769	6.611538	2
0.440584	0.214286	13.65429	1
0.288296	0.144928	8.753623	5
0.288126	0.121429	8.551429	1
0.549621	0.230769	16.19231	2
0.226169	0.096154	6.376923	2
0.279807	0.122892	7.753	5
0.29102	0.125301	8.0169	3
0.342383	0.15942	9.391304	4
0.379356	0.168831	10.08312	2
0.622506	0.198571	16.12	1
0.302045	0.130435	7.576812	5
0.513619	0.216438	12.8836	1
0.257178	0.092105	6.427632	3
0.435936	0.180519	10.91299	2
0.395219	0.161644	9.8082	1
0.223516	0.098684	5.409211	6

1.03751	0.44	24.64857	1
0.444283	0.188406	10.53478	4
0.133321	0.059211	3.144737	6
0.335541	0.14	7.8157	4
0.473192	0.214458	10.9494	5
0.206287	0.084507	4.6901	2
0.47769	0.213699	10.7233	1
0.193042	0.072368	4.228947	6
0.644151	0.265753	14.0808	1
0.222916	0.092105	4.803947	6
0.314898	0.144048	6.7774	6
0.490434	0.19726	10.4795	1
0.409657	0.181159	8.611594	5
0.458582	0.212048	9.6277	3
0.464361	0.191429	9.6586	4
0.388358	0.153425	8.0753	1
0.276777	0.125	5.726923	2
0.492319	0.2	10.1343	4
0.442332	0.177632	8.846053	3
0.653451	0.26087	13.0087	4
0.343217	0.183099	6.7775	2
0.327575	0.140845	6.4577	2
0.55357	0.236842	10.86184	6
0.204286	0.07971	4.004348	4
0.563396	0.221918	11.0397	1
0.445972	0.19759	8.6422	5
0.302816	0.13253	5.8663	3
0.876384	0.383562	16.8151	1
0.2112	0.092857	4.0405	6
0.460067	0.185542	8.7723	5
0.520616	0.178313	9.8108	5
0.405782	0.171053	7.632895	3
0.477196	0.19759	8.947	5
0.350821	0.222535	6.5577	2
0.449733	0.181159	8.381159	5
0.706707	0.305797	13.15362	5
0.415464	0.173913	7.697101	4
0.207079	0.084507	3.7592	2
0.281538	0.111842	5.036842	6
0.189962	0.072368	3.405263	6
0.535423	0.216901	9.5493	2
0.729796	0.293478	12.82319	4
0.25418	0.106024	4.4253	3
0.441721	0.184211	7.672368	6
0.466412	0.175904	8.1108	5
0.525613	0.221154	9.113462	2
0.664945	0.376812	11.53188	4

0.308415	0.12619	5.2857	6
0.423529	0.164474	7.240789	3
0.565326	0.228571	9.638571	1
0.521049	0.217105	8.744737	6
0.219274	1.930952	3.681	6
0.503782	0.204819	8.4229	5
0.915974	0.367143	15.28429	1
0.763477	0.311594	12.43043	4
0.579264	0.243373	9.4373	5
0.872167	0.369863	14.0849	1
0.632614	0.254795	10.1014	1
0.424189	0.171429	6.7714	4
0.414441	0.166265	6.5145	3
0.570757	0.23913	8.885507	5
0.31833	0.124286	4.9486	4
0.713188	0.269231	11.05192	2
0.252243	0.098684	3.89	3
0.274911	0.111905	4.2333	6
0.49958	0.217105	7.598684	3
0.433549	0.178571	6.556	6
0.28875	0.140476	4.3274	6
0.369119	0.148571	5.5057	4
0.367113	0.149398	5.3747	3
0.231754	0.078873	3.3394	2
0.63361	0.253623	9.142029	4
0.593607	0.26506	8.4337	5
0.540216	0.210145	7.653623	4
0.75016	0.307692	10.61346	2
0.557927	0.231325	7.8036	3
0.578918	0.238554	7.9096	3
0.579801	0.237143	7.8514	4
0.524587	0.222535	7.038	2
0.511028	0.211268	6.8268	2
0.393954	0.174648	5.1479	2
0.61661	0.248571	7.9586	4
0.450133	0.177632	5.809211	6
0.632899	0.257895	8.098684	3
0.30837	0.130952	3.9357	6
0.451751	0.177143	5.7029	4
1.171469	0.453846	14.775	2
0.259276	0.104762	3.1381	6
0.407183	0.163855	4.8747	3
2.199537	0.934247	81.12329	1
2.242178	0.958904	81.05342	1
2.019383	0.834211	72.46447	6
2.534164	1.082192	90.36712	1
2.538673	1.09589	86.82192	1

1.345301	0.55	44.51842	6
3.081568	1.250725	98.66667	4
2.527452	1.057534	74.12466	1
2.258723	1.010145	65.62174	5
2.360674	0.975342	67.98767	1
1.611199	0.677632	44.95789	6
2.801414	1.24	75.37	1
3.026701	1.183562	81.10274	1
2.498035	1.024658	66.21411	1
2.867669	1.194286	70.89857	4
1.946733	0.836145	47.47952	3
2.480635	1.033735	60.09398	3
3.763123	1.591781	90.89178	1
3.100752	1.272464	71.19855	5
1.635024	0.657831	37.14699	3
1.458017	0.722892	33.11807	3
3.285974	1.317143	73.22714	1
3.439649	1.424286	75.49571	4
1.543867	0.634211	33.47368	6
3.793044	1.805769	81.54615	2
3.327759	1.424658	71.07945	1
2.103466	0.853012	43.16265	3
3.33744	1.38	65.90857	4
3.959259	1.73012	78.16265	5
2.172532	0.909524	42.84048	6
4.592586	1.946377	89.82029	5
3.67691	1.497143	71.36286	1
4.561239	2.266667	88.52609	4
2.53546	1.051429	49.1	4
4.472629	1.884286	86.25857	1
3.683919	1.514493	69.78696	5
3.510699	1.487324	62.28028	2
3.319164	1.391429	57.98429	4
2.68837	1.109859	46.95775	2
4.533088	1.852174	79.0087	5
3.326859	1.293976	55.81446	5
4.451181	1.786957	74.40725	5
4.54241	1.916867	75.52771	5
4.002481	1.692754	65.73188	5
4.587954	1.878846	75.11154	2
3.717813	1.522892	60.70482	5
3.908407	1.617143	63.72429	4
4.3405	1.807246	70.25217	4
1.75547	0.675	28.21316	6
1.938846	0.743421	31.09342	3
4.361423	1.824638	69.29855	5
2.840687	1.210526	45.00395	6

4.620465	1.954217	72.95663	5
2.59632	1.120238	40.95952	6
4.449964	1.884337	69.35301	5
4.188884	1.65942	64.34638	4
2.180232	0.881579	33.05789	6
3.867654	1.753623	58.28696	4
2.648012	1.105263	39.13947	6
5.678367	2.292857	83.65143	1
4.202589	1.749398	61.76627	5
3.431701	1.395181	50.41687	3
4.757329	1.973494	69.74699	5
2.705067	1.098684	39.33421	6
4.724671	1.990385	68.325	2
3.948402	1.710843	56.95904	5
4.583789	1.838571	66.21	1
3.087705	1.272289	44.20241	3
4.222353	1.751807	59.73855	5
3.678903	1.552632	51.26447	3
4.873936	1.965714	66.97429	4
5.230017	2.074286	71.74143	4
6.032794	2.515385	81.64808	2
2.875014	1.175	38.57	3
4.587381	1.855844	60.68442	2
3.974932	1.625	52.21447	3
4.04981	1.688406	52.85507	4
3.336524	1.375904	43.66867	3
3.344028	1.447887	43.66479	2
4.810849	1.852174	62.4971	4
2.469307	1.059524	32.06429	6
6.296049	2.544928	81.1942	4
2.594606	1.050602	33.39639	3
6.854083	2.751923	87.47308	2
5.170757	2.125	65.53553	6
3.425009	1.453947	42.55921	3
3.672301	1.63662	45.32676	2
4.904503	2.010145	58.99565	5
3.403313	1.631159	40.53188	4
2.69657	2.957143	32.00595	6
4.706289	1.935211	55.06056	2
3.600816	1.480263	41.93947	3
1.496122	0.578947	17.26842	3
4.286179	1.760563	48.98028	2
4.889775	2.009859	55.84366	2
3.727121	1.501316	42.52368	3
5.624487	2.3	63.84571	4
5.315371	2.318841	59.88551	5
3.261955	1.361905	36.22857	6

4.025979	1.664789	44.54366	2
3.776065	1.543662	41.72254	2
3.707513	1.481159	40.66087	4
4.256987	1.778571	42.94156	2
4.002717	1.664789	40.20845	2
3.542274	1.45	34.18095	6
4.552395	1.785714	43.85974	2
5.434889	2.275714	51.55571	1
4.338105	1.840476	40.82262	6
3.892694	1.591667	35.08929	6
2.93803	1.25	24.17857	6
5.8162	2.278846	46.91923	2
7.295413	2.911538	57.75962	2
7.418362	2.892308	57.14038	2
5.710827	2.290385	43.47308	2
3.411865	1.42381	25.9	6
7.141321	2.917308	43.42308	2

Draft

Location	Site	Rank	Core	SizeClass	Vol_ml	DW_g	AFDM_g	pct_OM
CR 100	CS1	3		2 >2mm	20	51.0494	0.4298	0.84193
CR 100	CS1	3		2 1_2mm	4	9.4637	0.0774	0.817862
CR 100	CS1	3		2 0.5_1mm	3	6.6073	0.0735	1.112406
CR 100	CS1	3		2 <0.5mm	7	18.0477	0.0716	0.396726
CR 100	CS1	3		5 >2mm	17	41.844	0.3576	0.854603
CR 100	CS1	3		5 1_2mm	4	10.4142	0.0884	0.848841
CR 100	CS1	3		5 0.5_1mm	2.4	6.1261	0.0778	1.269976
CR 100	CS1	3		5 <0.5mm	6	13.4587	0.0756	0.561718
CR 100	CS1	3		8 >2mm	27	68.4639	0.4888	0.713953
CR 100	CS1	3		8 1_2mm	5	12.7159	0.1362	1.0711
CR 100	CS1	3		8 0.5_1mm	4	10.2376	0.0928	0.906462
CR 100	CS1	3		8 <0.5mm	7	18.5939	0.0717	0.38561
CR 100	CS1	3		11 >2mm	15	35.9966	0.5081	1.411522
CR 100	CS1	3		11 1_2mm	3.8	9.386	0.1028	1.095248
CR 100	CS1	3		11 0.5_1mm	2.2	5.4645	0.0595	1.088846
CR 100	CS1	3		11 <0.5mm	5	12.5811	0.0998	0.793253
CR 100	CS1	3		21 >2mm	40	102.4157	0.9365	0.914411
CR 100	CS1	3		21 1_2mm	9	22.0867	0.2132	0.965287
CR 100	CS1	3		21 0.5_1mm	6	14.2287	0.1321	0.928405
CR 100	CS1	3		21 <0.5mm	6	14.759	0.098	0.664002
CR 100	CS1	3		53 >2mm	13	31.9459	0.337	1.054908
CR 100	CS1	3		53 1_2mm	3.6	9.1575	0.0958	1.046137
CR 100	CS1	3		53 0.5_1mm	4	10.4334	0.1126	1.079226
CR 100	CS1	3		53 <0.5mm	9	21.4724	0.0951	0.442894
CR 100	CS1	3		54 >2mm	27	67.7883	0.6156	0.908121
CR 100	CS1	3		54 1_2mm	10	27.4074	0.3085	1.125608
CR 100	CS1	3		54 0.5_1mm	17	42.1215	0.3283	0.779412
CR 100	CS1	3		54 <0.5mm	18	45.7472	0.2474	0.540798
CR 100	CS1	3		59 >2mm	32	81.8434	0.6586	0.804708
CR 100	CS1	3		59 1_2mm	7	18.2061	0.1206	0.662415
CR 100	CS1	3		59 0.5_1mm	4.6	11.3607	0.1195	1.051872
CR 100	CS1	3		59 <0.5mm	8	19.6506	0.1025	0.521613
CR 100	CS1	3		65 >2mm	25	60.1479	0.6514	1.082997
CR 100	CS1	3		65 1_2mm	2.4	6.1794	0.0629	1.017898
CR 100	CS1	3		65 0.5_1mm	1.2	2.7669	0.0172	0.621634
CR 100	CS1	3		65 <0.5mm	1	3.4107	0.0321	0.941156
CR 100	CS1	3		68 >2mm	24	61.9713	0.6322	1.02015
CR 100	CS1	3		68 1_2mm	5	12.3727	0.1692	1.367527
CR 100	CS1	3		68 0.5_1mm	4	9.7078	0.0787	0.810688
CR 100	CS1	3		68 <0.5mm	11	29.9874	0.1352	0.450856
CR 300	OCS1	6		1 >2mm	32	79.8587	0.5315	0.665551
CR 300	OCS1	6		1 1_2mm	4	9.9494	0.1437	1.444308
CR 300	OCS1	6		1 0.5_1mm	6	12.8929	0.1261	0.978058
CR 300	OCS1	6		1 <0.5mm	8	19.3147	0.1618	0.837704
CR 300	OCS1	6		2 >2mm	18	43.3833	0.41	0.945064
CR 300	OCS1	6		2 1_2mm	1.8	4.5985	5.904	NA

CR 300	OCS1	6	2 0.5_1mm	2.6	6.2144	0.0523	0.841594
CR 300	OCS1	6	2 <0.5mm	6	14.9746	0.0996	0.665126
CR 300	OCS1	6	3 >2mm	21	53.8228	0.3272	0.607921
CR 300	OCS1	6	3 1_2mm	3	8.6844	0.0858	0.987978
CR 300	OCS1	6	3 0.5_1mm	4	8.7526	0.0658	0.751777
CR 300	OCS1	6	3 <0.5mm	7	18.7901	0.1007	0.535921
CR 300	OCS1	6	4 >2mm	33	84.5451	0.9063	1.071972
CR 300	OCS1	6	4 1_2mm	8	20.0152	0.2194	1.096167
CR 300	OCS1	6	4 0.5_1mm	7	16.7354	0.1637	0.978166
CR 300	OCS1	6	4 <0.5mm	19	46.2527	0.2246	0.485593
CR 300	OCS1	6	5 >2mm	19	48.2762	0.4521	0.936486
CR 300	OCS1	6	5 1_2mm	2.2	5.2448	0.0817	1.557733
CR 300	OCS1	6	5 0.5_1mm	2.4	6.3443	0.1068	1.683401
CR 300	OCS1	6	5 <0.5mm	6	16.9129	0.1169	0.691188
CR 300	OCS1	6	6 >2mm	17	40.5934	0.1584	0.390211
CR 300	OCS1	6	6 1_2mm	5	7.6502	0.096	1.254869
CR 300	OCS1	6	6 0.5_1mm	2.4	6.0849	0.0784	1.288435
CR 300	OCS1	6	6 <0.5mm	12	30.5883	0.1752	0.572768
CR 300	OCS1	6	7 >2mm	22	54.9652	0.8982	1.634125
CR 300	OCS1	6	7 1_2mm	2.2	5.519	0.1037	1.878964
CR 300	OCS1	6	7 0.5_1mm	2.4	5.586	0.0799	1.430362
CR 300	OCS1	6	7 <0.5mm	4	8.0093	0.1031	1.287254
CR 300	OCS1	6	25 >2mm	23	58.0469	0.551	0.949232
CR 300	OCS1	6	25 1_2mm	5	11.5796	0.1246	1.07603
CR 300	OCS1	6	25 0.5_1mm	4	10.5368	0.1017	0.965189
CR 300	OCS1	6	25 <0.5mm	4	9.9279	0.0635	0.639612
CR 300	OCS1	6	56 >2mm	26	65.5414	0.6587	1.005014
CR 300	OCS1	6	56 1_2mm	6	13.2848	0.2622	1.973684
CR 300	OCS1	6	56 0.5_1mm	7	16.7599	0.2532	1.510749
CR 300	OCS1	6	56 <0.5mm	35.2	43.133	0.3764	0.87265
CR 300	OCS1	6	61 >2mm	28	69.0564	1.2406	1.796503
CR 300	OCS1	6	61 1_2mm	6	13.2065	0.1503	1.138076
CR 300	OCS1	6	61 0.5_1mm	8	19.6858	0.1728	0.87779
CR 300	OCS1	6	61 <0.5mm	7	17.3414	0.1415	0.815966
Chinworth	OCS2	5	1 >2mm	5	9.5502	0.1929	2.019853
Chinworth	OCS2	5	1 1_2mm	5	10.2364	0.2054	2.006565
Chinworth	OCS2	5	1 0.5_1mm	6	15.1021	0.1899	1.257441
Chinworth	OCS2	5	1 <0.5mm	11.8	30.1783	0.2866	0.949689
Chinworth	OCS2	5	2 >2mm	7	17.0736	0.2531	1.482406
Chinworth	OCS2	5	2 1_2mm	3.6	8.8827	0.1577	1.775361
Chinworth	OCS2	5	2 0.5_1mm	5.4	13.3462	0.1329	0.995789
Chinworth	OCS2	5	2 <0.5mm	10.4	25.751	0.1952	0.758029
Chinworth	OCS2	5	3 >2mm	8	20.1986	0.4915	2.433337
Chinworth	OCS2	5	3 1_2mm	4	8.7721	0.1971	2.246896
Chinworth	OCS2	5	3 0.5_1mm	4.2	10.2599	0.1589	1.548748
Chinworth	OCS2	5	3 <0.5mm	6.6	17.4527	0.2039	1.168301
Chinworth	OCS2	5	4 >2mm	14	8.7441	0.3214	3.675621

Chinworth OCS2	5	4 1_2mm	3.2	8.4107	0.1322	1.571807
Chinworth OCS2	5	4 0.5_1mm	5	10.5338	0.1357	1.288234
Chinworth OCS2	5	4 <0.5mm	9	23.1439	0.2282	0.986005
Chinworth OCS2	5	5 >2mm	18	42.1164	0.60231	1.430108
Chinworth OCS2	5	5 1_2mm	6	16.3414	0.210554	1.288473
Chinworth OCS2	5	5 0.5_1mm	7	16.8487	0.202573	1.202309
Chinworth OCS2	5	5 <0.5mm	19	49.0866	0.624492	1.272225
Chinworth OCS2	5	6 >2mm	15	35.3046	0.4555	1.2902
Chinworth OCS2	5	6 1_2mm	3	7.4525	0.1356	1.819524
Chinworth OCS2	5	6 0.5_1mm	4	8.2795	0.0917	1.107555
Chinworth OCS2	5	6 <0.5mm	9	21.4588	0.2694	1.255429
Chinworth OCS2	5	7 >2mm	18	42.8787	0.5013	1.169112
Chinworth OCS2	5	7 1_2mm	5	10.3466	0.1115	1.077649
Chinworth OCS2	5	7 0.5_1mm	5	11.6386	0.1263	1.085182
Chinworth OCS2	5	7 <0.5mm	26	32.8931	0.3006	0.913869
Chinworth OCS2	5	8 >2mm	17	40.9914	0.7148	1.74378
Chinworth OCS2	5	8 1_2mm	7	15.8509	0.195	1.230214
Chinworth OCS2	5	8 0.5_1mm	7	17.2739	0.1794	1.038561
Chinworth OCS2	5	8 <0.5mm	14	33.201	0.2825	0.850878
Chinworth OCS2	5	9 >2mm	9	18.1431	0.5092	2.806577
Chinworth OCS2	5	9 1_2mm	3	7.4143	0.1643	2.215988
Chinworth OCS2	5	9 0.5_1mm	4	10.3598	0.1919	1.852352
Chinworth OCS2	5	9 <0.5mm	9	22.6372	0.3071	1.356617
Chinworth OCS2	5	10 >2mm	11	27.3712	0.391541	1.430484
Chinworth OCS2	5	10 1_2mm	3	7.3577	0.09293	1.263037
Chinworth OCS2	5	10 0.5_1mm	3	6.4033	0.070142	1.095403
Chinworth OCS2	5	10 <0.5mm	6	15.0491	0.133857	0.889467
CR 700 CS2	1	1 >2mm	32	80.6369	1.1584	1.436563
CR 700 CS2	1	1 1_2mm	0.4	1.2707	0.0286	2.250728
CR 700 CS2	1	1 0.5_1mm	0.4	1.0307	0.0173	1.678471
CR 700 CS2	1	1 <0.5mm	0.6	1.7857	0.0313	1.752814
CR 700 CS2	1	2 >2mm	18	40.9249	0.6066	1.482227
CR 700 CS2	1	2 1_2mm	2.4	6.2753	0.0971	1.547336
CR 700 CS2	1	2 0.5_1mm	2.2	5.2107	0.078	1.49692
CR 700 CS2	1	2 <0.5mm	3.4	8.5619	0.1087	1.269578
CR 700 CS2	1	3 >2mm	20	50.34353	0.535165	1.063026
CR 700 CS2	1	3 1_2mm	2.2	5.704885	0.08397	1.4719
CR 700 CS2	1	3 0.5_1mm	1.4	3.343918	0.053787	1.608513
CR 700 CS2	1	3 <0.5mm	2	4.252675	0.059398	1.396728
CR 700 CS2	1	4 >2mm	21	48.5049	0.450905	0.929606
CR 700 CS2	1	4 1_2mm	2.6	6.562812	0.051659	0.787149
CR 700 CS2	1	4 0.5_1mm	1.2	2.970874	0.030473	1.025727
CR 700 CS2	1	4 <0.5mm	2	2.883924	0.03918	1.358553
CR 700 CS2	1	5 >2mm	39	100.0298	0.792552	0.792316
CR 700 CS2	1	5 1_2mm	3.6	8.8509	0.094138	1.063594
CR 700 CS2	1	5 0.5_1mm	2.4	6.2203	0.075891	1.220058
CR 700 CS2	1	5 <0.5mm	4	9.3457	0.115547	1.236367

CR 700	CS2	1	6 >2mm	33	82.5302	0.581748	0.704891
CR 700	CS2	1	6 1_2mm	5	10.5644	0.131705	1.24669
CR 700	CS2	1	6 0.5_1mm	3	6.6539	0.0788	1.184268
CR 700	CS2	1	6 <0.5mm	5	11.3026	0.126563	1.119767
CR 700	CS2	1	7 >2mm	12	31.3994	0.3698	1.17773
CR 700	CS2	1	7 1_2mm	2.8	7.2627	0.0995	1.370014
CR 700	CS2	1	7 0.5_1mm	1.4	3.7659	0.0452	1.200244
CR 700	CS2	1	7 <0.5mm	3	7.7826	0.0746	0.958549
CR 700	CS2	1	8 >2mm	19.8	49.0772	0.5129	1.045088
CR 700	CS2	1	8 1_2mm	6	13.1067	0.1588	1.211594
CR 700	CS2	1	8 0.5_1mm	2.8	7.1516	0.0894	1.25007
CR 700	CS2	1	8 <0.5mm	3	7.6936	0.0977	1.269887
CR 700	CS2	1	9 >2mm	17	46.3082	0.7659	1.653919
CR 700	CS2	1	9 1_2mm	1.2	3.1298	0.0417	1.332354
CR 700	CS2	1	9 0.5_1mm	0.8	2.4233	0.041	1.691908
CR 700	CS2	1	9 <0.5mm	1.4	3.9135	0.0539	1.377284
CR 700	CS2	1	10 >2mm	37	83.8768	0.9312	1.1102
CR 700	CS2	1	10 1_2mm	2.4	5.9079	0.0867	1.467527
CR 700	CS2	1	10 0.5_1mm	1.6	3.4616	0.0495	1.429975
CR 700	CS2	1	10 <0.5mm	2	3.9144	0.0372	0.950337
PWP	CS3	2	1 >2mm	12	29.3003	0.3492	1.191797
PWP	CS3	2	1 1_2mm	3	7.521	0.1205	1.602181
PWP	CS3	2	1 0.5_1mm	2	4.851	0.0454	0.93589
PWP	CS3	2	1 <0.5mm	9	24.6609	0.0997	0.404284
PWP	CS3	2	2 >2mm	12	27.8824	0.3396	1.217973
PWP	CS3	2	2 1_2mm	3	8.456	0.1179	1.394276
PWP	CS3	2	2 0.5_1mm	2	5.6033	0.0661	1.179662
PWP	CS3	2	2 <0.5mm	8	18.34	0.0829	0.452017
PWP	CS3	2	3 >2mm	16	38.384	0.5673	1.47796
PWP	CS3	2	3 1_2mm	6	14.3929	0.1845	1.281882
PWP	CS3	2	3 0.5_1mm	6	14.6003	0.1585	1.085594
PWP	CS3	2	3 <0.5mm	23	60.7571	0.3415	0.562074
PWP	CS3	2	4 >2mm	16	38.918	0.5864	1.506758
PWP	CS3	2	4 1_2mm	4	10.9679	0.1209	1.102308
PWP	CS3	2	4 0.5_1mm	3	7.0973	0.0686	0.966565
PWP	CS3	2	4 <0.5mm	10	25.0492	0.1206	0.481453
PWP	CS3	2	5 >2mm	16	41.7706	0.4398	1.052894
PWP	CS3	2	5 1_2mm	5	11.8207	0.1551	1.312105
PWP	CS3	2	5 0.5_1mm	4	8.2022	0.0904	1.102143
PWP	CS3	2	5 <0.5mm	20	51.0862	0.2293	0.448849
PWP	CS3	2	6 >2mm	13	31.293	0.3692	1.179817
PWP	CS3	2	6 1_2mm	4	9.8182	0.1545	1.573608
PWP	CS3	2	6 0.5_1mm	2.4	6.287	0.0754	1.1993
PWP	CS3	2	6 <0.5mm	12	30.4443	0.3348	1.099713
PWP	CS3	2	7 >2mm	15	39.38119	0.340234	0.863951
PWP	CS3	2	7 1_2mm	4	10.023	0.11961	1.19336
PWP	CS3	2	7 0.5_1mm	2	5.9608	0.063402	1.063646

PWP	CS3	2	7 <0.5mm	14	36.65149	0.188256	0.513637
PWP	CS3	2	8 >2mm	15	35.6277	0.3277	0.91979
PWP	CS3	2	8 1_2mm	4	9.8906	0.1096	1.108123
PWP	CS3	2	8 0.5_1mm	3	7.6414	0.0777	1.016829
PWP	CS3	2	8 <0.5mm	11	26.9854	0.1438	0.532881
PWP	CS3	2	9 >2mm	9	21.8429	0.265	1.213209
PWP	CS3	2	9 1_2mm	3.2	7.6109	0.0938	1.232443
PWP	CS3	2	9 0.5_1mm	3.2	8.2265	0.0722	0.877651
PWP	CS3	2	9 <0.5mm	12	31.0486	0.1644	0.529492
PWP	CS3	2	10 >2mm	17	37.52402	0.43204	1.15137
PWP	CS3	2	10 1_2mm	3	7.39975	0.080294	1.085092
PWP	CS3	2	10 0.5_1mm	2.4	6.155752	0.056303	0.914634
PWP	CS3	2	10 <0.5mm	13	32.42068	0.215149	0.663618
20th Rd	OCS3	4	1 >2mm	23	56.3496	1.3541	2.403034
20th Rd	OCS3	4	1 1_2mm	3.2	7.5131	0.1258	1.674409
20th Rd	OCS3	4	1 0.5_1mm	3	7.2845	0.1255	1.722836
20th Rd	OCS3	4	1 <0.5mm	6.8	18.2357	0.355	1.946731
20th Rd	OCS3	4	2 >2mm	27	65.4173	0.576747	0.881643
20th Rd	OCS3	4	2 1_2mm	3.2	8.364	0.152088	1.818359
20th Rd	OCS3	4	2 0.5_1mm	3	6.8904	0.119406	1.732934
20th Rd	OCS3	4	2 <0.5mm	7	18.0756	0.322447	1.783883
20th Rd	OCS3	4	3 >2mm	19	45.1374	0.6315	1.399062
20th Rd	OCS3	4	3 1_2mm	5	12.2749	0.1694	1.380052
20th Rd	OCS3	4	3 0.5_1mm	5	12.0123	0.0965	0.803343
20th Rd	OCS3	4	3 <0.5mm	12.8	33.2641	0.2445	0.735027
20th Rd	OCS3	4	4 >2mm	16	39.6224	0.7129	1.799235
20th Rd	OCS3	4	4 1_2mm	3.4	8.5244	0.1325	1.554362
20th Rd	OCS3	4	4 0.5_1mm	2.4	5.8814	0.0816	1.387425
20th Rd	OCS3	4	4 <0.5mm	5.4	14.1001	0.2052	1.455309
20th Rd	OCS3	4	5 >2mm	24	59.6627	0.6469	1.084262
20th Rd	OCS3	4	5 1_2mm	3	9.1565	0.1696	1.852236
20th Rd	OCS3	4	5 0.5_1mm	3	6.9564	0.1381	1.985222
20th Rd	OCS3	4	5 <0.5mm	8	19.1281	0.326	1.704299
20th Rd	OCS3	4	6 >2mm	19	45.8608	0.488359	1.064873
20th Rd	OCS3	4	6 1_2mm	5	11.7704	0.143169	1.216349
20th Rd	OCS3	4	6 0.5_1mm	4	9.3323	0.089861	0.962905
20th Rd	OCS3	4	6 <0.5mm	12	27.9596	0.395331	1.413936
20th Rd	OCS3	4	7 >2mm	19	45.8569	0.550616	1.200728
20th Rd	OCS3	4	7 1_2mm	3	7.5957	0.197608	2.601574
20th Rd	OCS3	4	7 0.5_1mm	3	6.0503	0.116874	1.931712
20th Rd	OCS3	4	7 <0.5mm	11	28.6415	0.78347	2.735435
20th Rd	OCS3	4	8 >2mm	24	60.6969	0.7316	1.205333
20th Rd	OCS3	4	8 1_2mm	6	12.887	0.1886	1.46349
20th Rd	OCS3	4	8 0.5_1mm	3	9.6131	0.1414	1.470909
20th Rd	OCS3	4	8 <0.5mm	11	26.9177	0.2732	1.014946
20th Rd	OCS3	4	9 >2mm	12	28.43281	0.290897	1.023102
20th Rd	OCS3	4	9 1_2mm	3.4	8.325912	0.133114	1.598792

20th Rd	OCS3	4	9 0.5_1mm	3	7.489594	0.074006	0.988118
20th Rd	OCS3	4	9 <0.5mm	11	27.1578	0.267582	0.985288
20th Rd	OCS3	4	10 >2mm	27	68.77496	0.56796	0.825823
20th Rd	OCS3	4	10 1_2mm	3.4	8.30347	0.116862	1.407385
20th Rd	OCS3	4	10 0.5_1mm	2	4.593542	0.057367	1.248856
20th Rd	OCS3	4	10 <0.5mm	5	12.58677	0.172777	1.37269

Draft

total_vol_r	total_core_	total_core_	pct_vol	pct_DW	pct_AFDM
34	85.1681	0.6523	58.82353	59.93958	65.88993
34	85.1681	0.6523	11.76471	11.11179	11.86571
34	85.1681	0.6523	8.823529	7.757952	11.26782
34	85.1681	0.6523	20.58824	21.19068	10.97654
29.4	71.843	0.5994	57.82313	58.24367	59.65966
29.4	71.843	0.5994	13.60544	14.49578	14.74808
29.4	71.843	0.5994	8.163265	8.527066	12.97965
29.4	71.843	0.5994	20.40816	18.73349	12.61261
43	110.0113	0.7895	62.7907	62.23352	61.9126
43	110.0113	0.7895	11.62791	11.55872	17.25142
43	110.0113	0.7895	9.302326	9.305953	11.75427
43	110.0113	0.7895	16.27907	16.90181	9.081697
26	63.4282	0.7702	57.69231	56.75173	65.96988
26	63.4282	0.7702	14.61538	14.79783	13.34718
26	63.4282	0.7702	8.461538	8.615253	7.725266
26	63.4282	0.7702	19.23077	19.83518	12.95767
61	153.4901	1.3798	65.57377	66.72463	67.87216
61	153.4901	1.3798	14.7541	14.38966	15.45151
61	153.4901	1.3798	9.836066	9.270109	9.573851
61	153.4901	1.3798	9.836066	9.615604	7.102479
29.6	73.0092	0.6405	43.91892	43.75599	52.61514
29.6	73.0092	0.6405	12.16216	12.54294	14.95706
29.6	73.0092	0.6405	13.51351	14.29053	17.58002
29.6	73.0092	0.6405	30.40541	29.41054	14.84778
72	183.0644	1.4998	37.5	37.02976	41.04547
72	183.0644	1.4998	13.88889	14.97145	20.56941
72	183.0644	1.4998	23.61111	23.00912	21.88959
72	183.0644	1.4998	25	24.98968	16.49553
51.6	131.0608	1.0012	62.0155	62.44689	65.78106
51.6	131.0608	1.0012	13.56589	13.89134	12.04555
51.6	131.0608	1.0012	8.914729	8.668267	11.93568
51.6	131.0608	1.0012	15.50388	14.9935	10.23771
29.6	72.5049	0.7636	84.45946	82.95701	85.30644
29.6	72.5049	0.7636	8.108108	8.522734	8.237297
29.6	72.5049	0.7636	4.054054	3.816156	2.252488
29.6	72.5049	0.7636	3.378378	4.704096	4.203772
44	114.0392	1.0153	54.54545	54.3421	62.26731
44	114.0392	1.0153	11.36364	10.84951	16.66503
44	114.0392	1.0153	9.090909	8.512687	7.751404
44	114.0392	1.0153	25	26.29569	13.31626
50	122.0157	0.9631	64	65.44953	55.18638
50	122.0157	0.9631	8	8.154197	14.92057
50	122.0157	0.9631	12	10.56659	13.09314
50	122.0157	0.9631	16	15.82968	16.79992
28.4	69.1708	6.4659	63.38028	62.7191	6.340958
28.4	69.1708	6.4659	6.338028	6.648036	91.30979

28.4	69.1708	6.4659	9.15493	8.984138	0.808859
28.4	69.1708	6.4659	21.12676	21.64873	1.540389
35	90.0499	0.5795	60	59.76997	56.46247
35	90.0499	0.5795	8.571429	9.643986	14.80587
35	90.0499	0.5795	11.42857	9.719722	11.35462
35	90.0499	0.5795	20	20.86632	17.37705
67	167.5484	1.514	49.25373	50.46011	59.86129
67	167.5484	1.514	11.9403	11.94592	14.49141
67	167.5484	1.514	10.44776	9.988397	10.81242
67	167.5484	1.514	28.35821	27.60558	14.83487
29.6	76.7782	0.7575	64.18919	62.87748	59.68317
29.6	76.7782	0.7575	7.432432	6.831106	10.78548
29.6	76.7782	0.7575	8.108108	8.263153	14.09901
29.6	76.7782	0.7575	20.27027	22.02826	15.43234
36.4	84.9168	0.508	46.7033	47.80373	31.1811
36.4	84.9168	0.508	13.73626	9.009054	18.89764
36.4	84.9168	0.508	6.593407	7.16572	15.43307
36.4	84.9168	0.508	32.96703	36.02149	34.48819
30.6	74.0795	1.1849	71.89542	74.19759	75.80387
30.6	74.0795	1.1849	7.189542	7.450104	8.751793
30.6	74.0795	1.1849	7.843137	7.540548	6.743185
30.6	74.0795	1.1849	13.0719	10.81176	8.701156
36	90.0912	0.8408	63.88889	64.43127	65.53283
36	90.0912	0.8408	13.88889	12.8532	14.81922
36	90.0912	0.8408	11.11111	11.6957	12.09562
36	90.0912	0.8408	11.11111	11.01983	7.552331
74.2	138.7191	1.5505	35.04043	47.24757	42.48307
74.2	138.7191	1.5505	8.086253	9.576763	16.91067
74.2	138.7191	1.5505	9.433962	12.0819	16.33022
74.2	138.7191	1.5505	47.43935	31.09377	24.27604
49	119.2901	1.7052	57.14286	57.88946	72.75393
49	119.2901	1.7052	12.2449	11.07091	8.814215
49	119.2901	1.7052	16.32653	16.50246	10.13371
49	119.2901	1.7052	14.28571	14.53717	8.298147
27.8	65.067	0.8748	17.98561	14.67749	22.05075
27.8	65.067	0.8748	17.98561	15.73209	23.47965
27.8	65.067	0.8748	21.58273	23.21008	21.70782
27.8	65.067	0.8748	42.44604	46.38035	32.76177
26.4	65.0535	0.7389	26.51515	26.24547	34.25362
26.4	65.0535	0.7389	13.63636	13.65445	21.34254
26.4	65.0535	0.7389	20.45455	20.51573	17.9862
26.4	65.0535	0.7389	39.39394	39.58434	26.41765
22.8	56.6833	1.0514	35.08772	35.63413	46.74719
22.8	56.6833	1.0514	17.54386	15.47563	18.74643
22.8	56.6833	1.0514	18.42105	18.10039	15.11318
22.8	56.6833	1.0514	28.94737	30.78984	19.39319
31.2	50.8325	0.8175	44.87179	17.20179	39.31498

31.2	50.8325	0.8175	10.25641	16.54591	16.17125
31.2	50.8325	0.8175	16.02564	20.72257	16.59939
31.2	50.8325	0.8175	28.84615	45.52973	27.91437
50	124.3931	1.63993	36	33.8575	36.7278
50	124.3931	1.63993	12	13.1369	12.83924
50	124.3931	1.63993	14	13.54472	12.35257
50	124.3931	1.63993	38	39.46087	38.0804
31	72.4954	0.9522	48.3871	48.69909	47.83659
31	72.4954	0.9522	9.677419	10.27996	14.24071
31	72.4954	0.9522	12.90323	11.42072	9.63033
31	72.4954	0.9522	29.03226	29.60022	28.29238
54	97.757	1.0397	33.33333	43.86254	48.21583
54	97.757	1.0397	9.259259	10.584	10.72425
54	97.757	1.0397	9.259259	11.90564	12.14773
54	97.757	1.0397	48.14815	33.64782	28.91219
45	107.3172	1.3717	37.77778	38.19649	52.11052
45	107.3172	1.3717	15.55556	14.77014	14.21594
45	107.3172	1.3717	15.55556	16.09612	13.07866
45	107.3172	1.3717	31.11111	30.93726	20.59488
25	58.5544	1.1725	36	30.98503	43.42857
25	58.5544	1.1725	12	12.66224	14.01279
25	58.5544	1.1725	16	17.69261	16.36674
25	58.5544	1.1725	36	38.66012	26.1919
23	56.1813	0.68847	47.82609	48.71941	56.87114
23	56.1813	0.68847	13.04348	13.09635	13.49812
23	56.1813	0.68847	13.04348	11.39756	10.18809
23	56.1813	0.68847	26.08696	26.78667	19.44265
33.4	84.724	1.2356	95.80838	95.17598	93.75202
33.4	84.724	1.2356	1.197605	1.499811	2.314665
33.4	84.724	1.2356	1.197605	1.216538	1.400129
33.4	84.724	1.2356	1.796407	2.107667	2.533182
26	60.9728	0.8904	69.23077	67.11993	68.12668
26	60.9728	0.8904	9.230769	10.29197	10.90521
26	60.9728	0.8904	8.461538	8.545942	8.760108
26	60.9728	0.8904	13.07692	14.04216	12.208
25.6	63.64501	0.732321	78.125	79.10052	73.07794
25.6	63.64501	0.732321	8.59375	8.963601	11.46631
25.6	63.64501	0.732321	5.46875	5.254014	7.344782
25.6	63.64501	0.732321	7.8125	6.681867	8.110964
26.8	60.92251	0.572216	78.35821	79.61737	78.79966
26.8	60.92251	0.572216	9.701493	10.77239	9.027895
26.8	60.92251	0.572216	4.477612	4.87648	5.325444
26.8	60.92251	0.572216	7.462687	4.733758	6.846999
49	124.4467	1.078128	79.59184	80.37963	73.51186
49	124.4467	1.078128	7.346939	7.112201	8.731585
49	124.4467	1.078128	4.897959	4.998365	7.039168
49	124.4467	1.078128	8.163265	7.509801	10.71739

46	111.0511	0.918816	71.73913	74.31732	63.31496
46	111.0511	0.918816	10.86957	9.513098	14.33424
46	111.0511	0.918816	6.521739	5.991746	8.576253
46	111.0511	0.918816	10.86957	10.17784	13.77455
19.2	50.2106	0.5891	62.5	62.5354	62.77372
19.2	50.2106	0.5891	14.58333	14.46448	16.89017
19.2	50.2106	0.5891	7.291667	7.500209	7.672721
19.2	50.2106	0.5891	15.625	15.49991	12.66338
31.6	77.0291	0.8588	62.65823	63.71255	59.72287
31.6	77.0291	0.9025	18.98734	17.01526	17.59557
31.6	77.0291	0.8588	8.860759	9.284283	10.40987
31.6	77.0291	0.8588	9.493671	9.987914	11.37634
20.4	55.7748	0.9025	83.33333	83.0271	84.86427
20.4	55.7748	0.9025	5.882353	5.611495	4.620499
20.4	55.7748	0.9025	3.921569	4.344794	4.542936
20.4	55.7748	0.9025	6.862745	7.01661	5.972299
43	97.1607	1.1046	86.04651	86.32791	84.30201
43	97.1607	1.1046	5.581395	6.080545	7.848995
43	97.1607	1.1046	3.72093	3.562757	4.48126
43	97.1607	1.1046	4.651163	4.028789	3.367735
26	66.3332	0.6148	46.15385	44.1714	56.79896
26	66.3332	0.6148	11.53846	11.33821	19.59987
26	66.3332	0.6148	7.692308	7.31308	7.384515
26	66.3332	0.6148	34.61538	37.17731	16.21666
25	60.2817	0.6065	48	46.25351	55.9934
25	60.2817	0.6065	12	14.02747	19.43941
25	60.2817	0.6065	8	9.295192	10.8986
25	60.2817	0.6065	32	30.42383	13.66859
51	128.1343	1.2518	31.37255	29.95607	45.31874
51	128.1343	1.2518	11.76471	11.23267	14.73878
51	128.1343	1.2518	11.76471	11.39453	12.66177
51	128.1343	1.2518	45.09804	47.41673	27.28072
33	82.0324	0.8965	48.48485	47.44223	65.40993
33	82.0324	0.8965	12.12121	13.3702	13.48578
33	82.0324	0.8965	9.090909	8.651825	7.65198
33	82.0324	0.8965	30.30303	30.53574	13.45231
45	112.8797	0.9146	35.55556	37.00453	48.0866
45	112.8797	0.9146	11.11111	10.47194	16.95823
45	112.8797	0.9146	8.888889	7.26632	9.884102
45	112.8797	0.9146	44.44444	45.25721	25.07107
31.4	77.8425	0.9339	41.40127	40.2004	39.53314
31.4	77.8425	0.9339	12.73885	12.6129	16.54353
31.4	77.8425	0.9339	7.643312	8.076565	8.07367
31.4	77.8425	0.9339	38.21656	39.11013	35.84966
35	92.01648	0.711502	42.85714	42.79798	47.81913
35	92.01648	0.711502	11.42857	10.89261	16.81097
35	92.01648	0.711502	5.714286	6.47797	8.910977

35	92.01648	0.711502	40	39.83144	26.45892
33	80.1451	0.6588	45.45455	44.454	49.74196
33	80.1451	0.6588	12.12121	12.34087	16.63631
33	80.1451	0.6588	9.090909	9.534457	11.79417
33	80.1451	0.6588	33.33333	33.67068	21.82757
27.4	68.7289	0.5954	32.84672	31.78124	44.50789
27.4	68.7289	0.5954	11.67883	11.0738	15.75411
27.4	68.7289	0.5954	11.67883	11.96949	12.1263
27.4	68.7289	0.5954	43.79562	45.17546	27.61169
35.4	83.5002	0.783786	48.0226	44.93884	55.12219
35.4	83.5002	0.783786	8.474576	8.861954	10.24438
35.4	83.5002	0.783786	6.779661	7.372141	7.183412
35.4	83.5002	0.783786	36.72316	38.82707	27.45001
36	89.3829	1.9604	63.88889	63.04293	69.07264
36	89.3829	1.9604	8.888889	8.405523	6.417058
36	89.3829	1.9604	8.333333	8.149769	6.401755
36	89.3829	1.9604	18.88889	20.40178	18.10855
40.2	98.7473	1.170688	67.16418	66.24718	49.26563
40.2	98.7473	1.170688	7.960199	8.470105	12.9913
40.2	98.7473	1.170688	7.462687	6.977811	10.19965
40.2	98.7473	1.170688	17.41294	18.30491	27.54342
41.8	102.6887	1.1419	45.45455	43.95557	55.30257
41.8	102.6887	1.1419	11.96172	11.95351	14.83492
41.8	102.6887	1.1419	11.96172	11.69778	8.450828
41.8	102.6887	1.1419	30.62201	32.39315	21.41168
27.2	68.1283	1.1322	58.82353	58.1585	62.96591
27.2	68.1283	1.1322	12.5	12.51227	11.70288
27.2	68.1283	1.1322	8.823529	8.63283	7.207207
27.2	68.1283	1.1322	19.85294	20.69639	18.12401
38	94.9037	1.2806	63.15789	62.86657	50.51538
38	94.9037	1.2806	7.894737	9.648201	13.24379
38	94.9037	1.2806	7.894737	7.329957	10.78401
38	94.9037	1.2806	21.05263	20.15527	25.45682
40	94.9231	1.116721	47.5	48.31363	43.73157
40	94.9231	1.116721	12.5	12.39993	12.8205
40	94.9231	1.116721	10	9.831432	8.046885
40	94.9231	1.116721	30	29.455	35.40104
36	88.1444	1.648568	52.77778	52.02475	33.39968
36	88.1444	1.648568	8.333333	8.617337	11.98663
36	88.1444	1.648568	8.333333	6.864078	7.089448
36	88.1444	1.648568	30.55556	32.49384	47.52424
44	110.1147	1.3348	54.54545	55.12152	54.80971
44	110.1147	1.3348	13.63636	11.70325	14.12946
44	110.1147	1.3348	6.818182	8.730079	10.59335
44	110.1147	1.3348	25	24.44515	20.46749
29.4	71.40611	0.765599	40.81633	39.81845	37.99596
29.4	71.40611	0.765599	11.56463	11.65994	17.38691

29.4	71.40611	0.765599	10.20408	10.48873	9.666414
29.4	71.40611	0.765599	37.41497	38.03287	34.95072
37.4	94.25874	0.914966	72.19251	72.96401	62.07443
37.4	94.25874	0.914966	9.090909	8.80923	12.77226
37.4	94.25874	0.914966	5.347594	4.873332	6.269824
37.4	94.25874	0.914966	13.36898	13.35343	18.88348

Draft

Location	Site	date	Rank	Rep	BD_g.ml	pct_OM	Mussel_Pr	NO3_ugN.l
20th Rd	OCS3	#####	4	7	1.81244	NA	0	108.2029
20th Rd	OCS3	#####	4	6	1.7798	NA	0	146.2021
20th Rd	OCS3	#####	4	2	1.71308	2.605833	0	202.7286
20th Rd	OCS3	#####	4	5	1.91198	2.097302	0	143.4125
20th Rd	OCS3	#####	4	11	1.77106	1.640825	0	148.9232
20th Rd	OCS3	#####	4	9	1.76444	1.539299	0	79.8789
20th Rd	OCS3	#####	4	8	1.81024	1.003182	0	197.2171
20th Rd	OCS3	#####	4	3	1.8463	0.971673	0	127.4328
20th Rd	OCS3	#####	4	1	2.06122	0.920814	0	307.5192
20th Rd	OCS3	#####	4	10	1.87466	0.803346	0	160.6237
20th Rd	OCS3	#####	4	4	1.88418	0.62839	0	166.2406
Chinworth	OCS2	#####	5	1	0.84374	NA	0	67.6495
Chinworth	OCS2	#####	5	8	0.91542	NA	0	<5
Chinworth	OCS2	#####	5	5	1.32212	2.502042	0	<5
Chinworth	OCS2	#####	5	2	1.67184	1.3853	0	128.1354
Chinworth	OCS2	#####	5	7	1.94326	1.372951	0	42.2574
Chinworth	OCS2	#####	5	9	1.52536	1.010909	0	39.4321
Chinworth	OCS2	#####	5	3	1.4114	0.779368	0	<5
Chinworth	OCS2	#####	5	4	1.43008	0.718841	0	205.8295
Chinworth	OCS2	#####	5	6	1.66212	0.695497	0	19.5855
CR 100	CS1	#####	3	1	1.9326	0.939667	1	23.7731
CR 100	CS1	#####	3	5	1.88802	0.89194	1	92.29945
CR 100	CS1	#####	3	2	1.7382	0.864112	1	74.8139
CR 100	CS1	#####	3	8	1.83468	0.80777	1	82.8842
CR 100	CS1	#####	3	3	2.01572	0.787808	1	116.5353
CR 100	CS1	#####	3	4	1.88394	0.749493	1	76.5433
CR 100	CS1	#####	3	7	1.65936	0.693038	1	81.3701
CR 100	CS1	#####	3	9	1.75564	0.665284	1	79.7376
CR 100	CS1	#####	3	6	2.0092	0.606211	1	110.1185
CR 100	CS1	#####	3	10	2.08248	0.555107	1	83.8343
CR 300	OCS1	#####	6	3	1.89842	2.444138	0	81.8106
CR 300	OCS1	#####	6	5	1.90128	1.761971	0	83.363
CR 300	OCS1	#####	6	1	1.84432	1.260085	0	106.3265
CR 300	OCS1	#####	6	9	1.8001	0.896617	0	96.2459
CR 300	OCS1	#####	6	6	1.61318	0.800903	0	284.2605
CR 300	OCS1	#####	6	4	1.8201	0.703258	0	330.2657
CR 300	OCS1	#####	6	10	2.18162	0.661893	0	171.4975
CR 300	OCS1	#####	6	2	1.59044	0.632529	0	60.9644
CR 300	OCS1	#####	6	8	1.89786	0.605946	0	90.7044
CR 300	OCS1	#####	6	7	2.01504	0.505201	0	96.6982
CR 700	CS2	#####	1	7	1.15594	3.804696	1	<5
CR 700	CS2	#####	1	9	1.24556	2.333087	1	81.7291
CR 700	CS2	#####	1	3	1.70196	1.713319	1	69.1985
CR 700	CS2	#####	1	10	1.34424	1.222996	1	103.7918
CR 700	CS2	#####	1	1	1.6918	0.920913	1	<5
CR 700	CS2	#####	1	5	1.19294	0.841618	1	92.4411

CR 700	CS2	#####	1	8	1.41678	0.80323	1	32.09555
CR 700	CS2	#####	1	2	1.481	0.796759	1	133.1406
CR 700	CS2	#####	1	4	1.2427	0.796652	1	27.5635
CR 700	CS2	#####	1	6	1.385	0.571841	1	87.1987
PWP	CS3	#####	2	10	1.43962	0.89607	1	74.4591
PWP	CS3	#####	2	2	1.28288	0.824707	1	112.7464
PWP	CS3	#####	2	4	1.38034	0.821537	1	302.8538
PWP	CS3	#####	2	6	1.2635	0.808864	1	307.5469
PWP	CS3	#####	2	9	1.5116	0.808415	1	145.0128
PWP	CS3	#####	2	7	1.42204	0.77213	1	380.1405
PWP	CS3	#####	2	1	1.404	0.695157	1	368.3752
PWP	CS3	#####	2	5	1.42698	0.69097	1	118.2266
PWP	CS3	#####	2	3	1.39964	0.637307	1	271.0156
PWP	CS3	#####	2	8	1.36066	0.511516	1	230.0099
20th Rd	OCS3	#####	4	7	1.67682	2.350878	0	218.6416
20th Rd	OCS3	#####	4	6	1.28404	1.750724	0	142.8239
20th Rd	OCS3	#####	4	9	1.71058	1.624011	0	196.382
20th Rd	OCS3	#####	4	10	1.6335	1.3015	0	194.7539
20th Rd	OCS3	#####	4	8	1.87794	1.224746	0	223.5616
20th Rd	OCS3	#####	4	2	1.93178	1.198894	0	61.009
20th Rd	OCS3	#####	4	5	1.83264	1.174262	0	146.3174
20th Rd	OCS3	#####	4	3	1.76772	1.080488	0	180.4722
20th Rd	OCS3	#####	4	1	1.84558	0.704386	0	234.1828
20th Rd	OCS3	#####	4	4	1.71112	0.530647	0	250.7175
Chinworth	OCS2	#####	5	7	1.2381	1.967531	0	16.69015
Chinworth	OCS2	#####	5	5	1.37622	1.893593	0	<5
Chinworth	OCS2	#####	5	9	1.27024	1.809107	0	<5
Chinworth	OCS2	#####	5	8	1.59588	1.487581	0	<5
Chinworth	OCS2	#####	5	6	1.70446	1.483168	0	<5
Chinworth	OCS2	#####	5	3	1.41016	1.412606	0	<5
Chinworth	OCS2	#####	5	1	1.6872	1.312233	0	<5
Chinworth	OCS2	#####	5	2	1.57582	1.067381	0	<5
Chinworth	OCS2	#####	5	4	1.82954	0.932475	0	9.6975
CR 100	CS1	#####	3	1	1.87196	0.916686	1	24.1199
CR 100	CS1	#####	3	3	1.84878	0.905462	1	47.7541
CR 100	CS1	#####	3	4	1.93954	0.816688	1	36.6259
CR 100	CS1	#####	3	9	1.71398	0.764303	1	56.89715
CR 100	CS1	#####	3	2	1.81092	0.746582	1	78.4439
CR 100	CS1	#####	3	10	1.75518	0.677993	1	90.2364
CR 100	CS1	#####	3	5	1.7926	0.66384	1	37.10325
CR 100	CS1	#####	3	6	1.90132	0.656386	1	55.8112
CR 100	CS1	#####	3	7	1.8615	0.626377	1	104.9494
CR 100	CS1	#####	3	8	1.90158	0.594243	1	58.7104
CR 300	OCS1	#####	6	6	1.85186	1.285194	0	145.1881
CR 300	OCS1	#####	6	2	2.06372	1.20559	0	57.22905
CR 300	OCS1	#####	6	4	1.97646	1.070601	0	270.7667
CR 300	OCS1	#####	6	10	1.8716	1.057918	0	73.0334

CR 300	OCS1	#####	6	7	1.83644	1.021542	0	43.08925
CR 300	OCS1	#####	6	5	1.86926	0.981137	0	228.2053
CR 300	OCS1	#####	6	3	1.89456	0.924753	0	58.0835
CR 300	OCS1	#####	6	1	2.00418	0.766398	0	78.1153
CR 300	OCS1	#####	6	9	1.7374	0.560608	0	<5
CR 300	OCS1	#####	6	8	1.7058	0.38926	0	145.4226
CR 700	CS2	#####	1	8	1.72952	1.477867	1	156.4805
CR 700	CS2	#####	1	5	1.8539	1.452074	1	96.61745
CR 700	CS2	#####	1	9	1.7267	1.348237	1	70.15685
CR 700	CS2	#####	1	10	1.68266	1.145805	1	132.4749
CR 700	CS2	#####	1	6	1.73878	1.073166	1	120.9417
CR 700	CS2	#####	1	7	1.93598	0.958688	1	77.53495
CR 700	CS2	#####	1	1	1.92152	0.907615	1	148.4121
CR 700	CS2	#####	1	4	1.86988	0.904871	1	77.7272
CR 700	CS2	#####	1	2	1.76084	0.745099	1	89.18515
CR 700	CS2	#####	1	3	1.9016	0.667859	1	106.3833
PWP	CS3	#####	2	8	1.39258	0.926338	1	60.41915
PWP	CS3	#####	2	3	1.57412	0.87668	1	177.6431
PWP	CS3	#####	2	5	1.50796	0.73742	1	153.2267
PWP	CS3	#####	2	6	1.4316	0.695725	1	108.1199
PWP	CS3	#####	2	1	1.37314	0.687475	1	41.6548
PWP	CS3	#####	2	4	1.49842	0.596628	1	169.6745
PWP	CS3	#####	2	10	1.50914	0.540705	1	138.7355
PWP	CS3	#####	2	9	1.37072	0.497549	1	160.2549
PWP	CS3	#####	2	2	1.50908	0.451931	1	138.4871
PWP	CS3	#####	2	7	1.35828	0.412286	1	190.6915
20th Rd	OCS3	7/9/2009	4	6 NA	NA		0	171.5509
20th Rd	OCS3	7/9/2009	4	8 NA	NA		0	197.9946
20th Rd	OCS3	7/9/2009	4	1 NA	NA		0	214.9564
20th Rd	OCS3	7/9/2009	4	2 NA	NA		0	230.1347
20th Rd	OCS3	7/9/2009	4	5 NA	NA		0	239.6521
20th Rd	OCS3	7/9/2009	4	4 NA	NA		0	241.6622
20th Rd	OCS3	7/9/2009	4	7 NA	NA		0	284.73
20th Rd	OCS3	7/9/2009	4	3 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	4 NA	NA		0	11.6465
Chinworth	OCS2	7/9/2009	5	8 NA	NA		0	52.954
Chinworth	OCS2	7/9/2009	5	1 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	10 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	2 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	3 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	5 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	6 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	7 NA	NA		0	<5
Chinworth	OCS2	7/9/2009	5	9 NA	NA		0	<5
CR 100	CS1	7/9/2009	3	3 NA	NA		1	24.8087
CR 100	CS1	7/9/2009	3	1 NA	NA		1	29.68675
CR 100	CS1	7/9/2009	3	2 NA	NA		1	54.7427

CR 100	CS1	7/9/2009	3	8 NA	NA	1	82.37205
CR 100	CS1	7/9/2009	3	4 NA	NA	1	88.0503
CR 100	CS1	7/9/2009	3	9 NA	NA	1	94.94345
CR 100	CS1	7/9/2009	3	10 NA	NA	1	97.9769
CR 100	CS1	7/9/2009	3	5 NA	NA	1	101.0725
CR 100	CS1	7/9/2009	3	7 NA	NA	1	108.3352
CR 100	CS1	7/9/2009	3	6 NA	NA	1	114.0568
CR 300	OCS1	7/9/2009	6	8 NA	NA	0	54.2573
CR 300	OCS1	7/9/2009	6	7 NA	NA	0	66.55165
CR 300	OCS1	7/9/2009	6	1 NA	NA	0	67.269
CR 300	OCS1	7/9/2009	6	2 NA	NA	0	68.8509
CR 300	OCS1	7/9/2009	6	6 NA	NA	0	82.5267
CR 300	OCS1	7/9/2009	6	4 NA	NA	0	103.0706
CR 300	OCS1	7/9/2009	6	5 NA	NA	0	140.5735
CR 300	OCS1	7/9/2009	6	3 NA	NA	0	154.3683
CR 300	OCS1	7/9/2009	6	10 NA	NA	0	<5
CR 300	OCS1	7/9/2009	6	9 NA	NA	0	<5
CR 700	CS2	7/9/2009	1	2 NA	NA	1	65.9373
CR 700	CS2	7/9/2009	1	1 NA	NA	1	75.2111
CR 700	CS2	7/9/2009	1	4 NA	NA	1	119.3886
CR 700	CS2	7/9/2009	1	8 NA	NA	1	129.7688
CR 700	CS2	7/9/2009	1	10 NA	NA	1	137.4869
CR 700	CS2	7/9/2009	1	6 NA	NA	1	159.8711
CR 700	CS2	7/9/2009	1	3 NA	NA	1	176.8692
CR 700	CS2	7/9/2009	1	9 NA	NA	1	192.6625
CR 700	CS2	7/9/2009	1	5 NA	NA	1	193.5608
CR 700	CS2	7/9/2009	1	7 NA	NA	1	205.5133
PWP	CS3	7/9/2009	2	2 NA	NA	1	27.4043
PWP	CS3	7/9/2009	2	5 NA	NA	1	51.57845
PWP	CS3	7/9/2009	2	4 NA	NA	1	97.41525
PWP	CS3	7/9/2009	2	8 NA	NA	1	153.3603
PWP	CS3	7/9/2009	2	1 NA	NA	1	212.5707
PWP	CS3	7/9/2009	2	6 NA	NA	1	254.3003
PWP	CS3	7/9/2009	2	9 NA	NA	1	313.1717
PWP	CS3	7/9/2009	2	7 NA	NA	1	325.6436
PWP	CS3	7/9/2009	2	3 NA	NA	1	357.9305
PWP	CS3	7/9/2009	2	10 NA	NA	1	501.8754
20th Rd	OCS3	#####	4	10	1.30436 1.306388	0	NA
20th Rd	OCS3	#####	4	4	1.9443 1.19426	0	53.52721
20th Rd	OCS3	#####	4	2	1.82412 1.104094	0	81.41042
20th Rd	OCS3	#####	4	1	1.95208 1.070653	0	54.57815
20th Rd	OCS3	#####	4	8	1.85194 1.029191	0	<5
20th Rd	OCS3	#####	4	5	1.73128 0.88605	0	69.91646
20th Rd	OCS3	#####	4	3	1.90134 0.882535	0	9.461875
20th Rd	OCS3	#####	4	6	1.9526 0.875755	0	34.90085
20th Rd	OCS3	#####	4	7	1.72804 0.652763	0	119.9646
20th Rd	OCS3	#####	4	9	1.5768 0.632927	0	<5

Chinworth	OCS2	#####	5	7	1.69982	2.541446	0 <5
Chinworth	OCS2	#####	5	9	1.38954	2.253983	0 <5
Chinworth	OCS2	#####	5	5	1.5557	1.869255	0 <5
Chinworth	OCS2	#####	5	4	1.94082	1.415896	0 <5
Chinworth	OCS2	#####	5	3	1.7855	1.358723	0 <5
Chinworth	OCS2	#####	5	8	1.66948	1.160841	0 <5
Chinworth	OCS2	#####	5	6	1.60366	1.134904	0 <5
Chinworth	OCS2	#####	5	2	1.83164	1.117032	0 <5
Chinworth	OCS2	#####	5	10	1.6878	1.096101	0 <5
Chinworth	OCS2	#####	5	1	1.64598	0.777652	0 <5
CR 100	CS1	#####	3	7	1.89546	0.849398	1 <5
CR 100	CS1	#####	3	1	1.8033	0.753064	1 <5
CR 100	CS1	#####	3	10	1.96676	0.75149	1 <5
CR 100	CS1	#####	3	4	1.95306	0.750617	1 <5
CR 100	CS1	#####	3	8	1.78258	0.720304	1 10.91943
CR 100	CS1	#####	3	5	1.85026	0.712332	1 <5
CR 100	CS1	#####	3	9	1.97966	0.691028	1 <5
CR 100	CS1	#####	3	3	1.9534	0.66653	1 <5
CR 100	CS1	#####	3	2	1.64306	0.592796	1 <5
CR 100	CS1	#####	3	6	1.8447	0.568114	1 <5
CR 300	OCS1	#####	6	10	2.02136	1.113112	0 <5
CR 300	OCS1	#####	6	2	2.04168	1.003095	0 <5
CR 300	OCS1	#####	6	6	2.08652	0.834883	0 <5
CR 300	OCS1	#####	6	1	1.99436	0.719028	0 3.358439
CR 300	OCS1	#####	6	7	2.00162	0.717419	0 <5
CR 300	OCS1	#####	6	5	2.05046	0.668143	0 7.400766
CR 300	OCS1	#####	6	8	2.07544	0.636973	0 <5
CR 300	OCS1	#####	6	3	1.96974	0.577741	0 <5
CR 300	OCS1	#####	6	9	1.96828	0.574105	0 <5
CR 300	OCS1	#####	6	4	1.98876	0.540035	0 26.11289
CR 700	CS2	#####	1	6	2.17544	1.898467	1 63.62476
CR 700	CS2	#####	1	2	1.9439	1.854005	1 79.60403
CR 700	CS2	#####	1	8	1.69212	1.705553	1 70.90956
CR 700	CS2	#####	1	4	1.41232	1.642687	1 37.15597
CR 700	CS2	#####	1	10	1.81994	1.636318	1 2.512708
CR 700	CS2	#####	1	7	1.7783	1.510431	1 30.91531
CR 700	CS2	#####	1	3	1.87434	1.237769	1 41.18361
CR 700	CS2	#####	1	9	1.75656	1.175024	1 <5
CR 700	CS2	#####	1	1	1.90586	0.879393	1 71.40058
CR 700	CS2	#####	1	5	1.29484	0.812456	1 7.93474
PWP	CS3	#####	2	10	1.1349	3.112168	1 <5
PWP	CS3	#####	2	1	1.43196	0.892483	1 <5
PWP	CS3	#####	2	7	1.595	0.873981	1 43.23367
PWP	CS3	#####	2	9	1.66998	0.845519	1 <5
PWP	CS3	#####	2	4	1.51328	0.819412	1 62.69425
PWP	CS3	#####	2	8	1.6881	0.798531	1 <5
PWP	CS3	#####	2	2	1.39058	0.740698	1 58.11356

PWP	CS3	#####	2	3	1.57384	0.608702	1	56.42275
PWP	CS3	#####	2	5	1.48108	0.5523	1	82.85374
PWP	CS3	#####	2	6	1.41056	0.401259	1	116.7874
20th Rd	OCS3	#####	4	4	1.84634	2.028879	0	<5
20th Rd	OCS3	#####	4	10	1.38944	1.439429	0	<5
20th Rd	OCS3	#####	4	5	1.78414	1.295862	0	56.8353
20th Rd	OCS3	#####	4	9	1.64492	1.292464	0	9.3984
20th Rd	OCS3	#####	4	2	1.79662	1.188899	0	26.06355
20th Rd	OCS3	#####	4	6	1.98886	1.086049	0	<5
20th Rd	OCS3	#####	4	1	1.63638	1.075545	0	24.1965
20th Rd	OCS3	#####	4	3	1.95612	1.069464	0	23.7816
20th Rd	OCS3	#####	4	7	1.93718	0.971515	0	176.4515
20th Rd	OCS3	#####	4	8	1.66926	0.847082	0	47.50005
Chinworth	OCS2	#####	5	6	0.81188	NA	0	<5
Chinworth	OCS2	#####	5	10	1.30908	4.789623	0	<5
Chinworth	OCS2	#####	5	4	1.21008	2.892371	0	<5
Chinworth	OCS2	#####	5	5	1.71926	2.268418	0	<5
Chinworth	OCS2	#####	5	2	1.53362	1.901384	0	<5
Chinworth	OCS2	#####	5	3	1.32746	1.795911	0	<5
Chinworth	OCS2	#####	5	7	1.74764	1.633059	0	NA
Chinworth	OCS2	#####	5	9	1.69328	1.436266	0	<5
Chinworth	OCS2	#####	5	8	1.57242	1.299907	0	<5
Chinworth	OCS2	#####	5	1	1.89842	1.157805	0	30.90405
CR 100	CS1	#####	3	6	1.89544	NA	1	260.6858
CR 100	CS1	#####	3	9	2.19754	NA	1	306.0842
CR 100	CS1	#####	3	8	1.94778	1.894464	1	59.35928
CR 100	CS1	#####	3	4	1.49106	1.095865	1	776.831
CR 100	CS1	#####	3	10	1.90398	0.946439	1	344.6588
CR 100	CS1	#####	3	3	1.76782	0.821351	1	565.5299
CR 100	CS1	#####	3	2	1.69172	0.75308	1	103.0275
CR 100	CS1	#####	3	7	1.49586	0.730015	1	430.1689
CR 100	CS1	#####	3	1	1.77224	0.685009	1	414.2349
CR 100	CS1	#####	3	5	1.66632	0.464497	1	88.42891
CR 300	OCS1	#####	6	5	1.87224	NA	0	80.7612
CR 300	OCS1	#####	6	1	1.81286	NA	0	288.2606
CR 300	OCS1	#####	6	7	1.88188	1.051077	0	35.43338
CR 300	OCS1	#####	6	10	1.9463	0.921749	0	342.7053
CR 300	OCS1	#####	6	4	1.55594	0.838079	0	47.22345
CR 300	OCS1	#####	6	8	1.6881	0.781944	0	120.6844
CR 300	OCS1	#####	6	3	1.74304	0.730907	0	142.8106
CR 300	OCS1	#####	6	2	1.9317	0.703008	0	223.2313
CR 300	OCS1	#####	6	6	1.58614	0.619113	0	137.7755
CR 300	OCS1	#####	6	9	1.95724	0.583475	0	143.6333
CR 700	CS2	#####	1	7	2.174	2.041398	1	66.1014
CR 700	CS2	#####	1	5	1.84694	1.641634	1	61.64123
CR 700	CS2	#####	1	3	1.77758	1.412032	1	179.1415
CR 700	CS2	#####	1	2	1.87428	1.406407	1	385.24

CR 700	CS2	#####	1	4	1.93328	1.372796	1	135.6801
CR 700	CS2	#####	1	10	1.41258	1.302581	1	143.3869
CR 700	CS2	#####	1	6	1.78424	1.271129	1	175.5716
CR 700	CS2	#####	1	9	1.8361	1.26028	1	204.4094
CR 700	CS2	#####	1	1	1.38226	1.020069	1	17.1432
CR 700	CS2	#####	1	8	2.42476	0.972467	1	196.3336
PWP	CS3	#####	2	2	1.29894	2.06938	1	<5
PWP	CS3	#####	2	3	1.54048	1.456689	1	<5
PWP	CS3	#####	2	10	1.4237	1.156142	1	<5
PWP	CS3	#####	2	1	2.13076	1.117911	1	162.8951
PWP	CS3	#####	2	4	1.77676	1.016457	1	213.2954
PWP	CS3	#####	2	6	1.2424	0.858017	1	300.4757
PWP	CS3	#####	2	5	1.75506	0.820485	1	184.1333
PWP	CS3	#####	2	7	1.33806	0.748845	1	204.9303
PWP	CS3	#####	2	8	1.39632	0.681792	1	279.5761
PWP	CS3	#####	2	9	1.31288	0.635245	1	144.3202
20th Rd	OCS3	9/2/2009	4	9	1.91896	1.679034	0	<5
20th Rd	OCS3	9/2/2009	4	1	2.2293	1.256	0	<5
20th Rd	OCS3	9/2/2009	4	2	2.03856	1.014442	0	<5
20th Rd	OCS3	9/2/2009	4	6	1.87306	0.875573	0	25.3886
20th Rd	OCS3	9/2/2009	4	5	1.88072	0.862436	0	<5
20th Rd	OCS3	9/2/2009	4	4	1.88972	0.856212	0	<5
20th Rd	OCS3	9/2/2009	4	8	2.1502	0.802716	0	<5
20th Rd	OCS3	9/2/2009	4	7	2.16396	0.731991	0	47.38806
20th Rd	OCS3	9/2/2009	4	10	1.54706	0.617946	0	<5
20th Rd	OCS3	9/2/2009	4	3	1.97774	0.608776	0	63.93911
Chinworth	OCS2	9/2/2009	5	5	1.4468	NA	0	<5
Chinworth	OCS2	9/2/2009	5	2	1.09326	3.464867	0	<5
Chinworth	OCS2	9/2/2009	5	7	1.26684	3.376906	0	<5
Chinworth	OCS2	9/2/2009	5	4	1.1727	3.115886	0	<5
Chinworth	OCS2	9/2/2009	5	3	1.49706	2.424753	0	<5
Chinworth	OCS2	9/2/2009	5	8	1.3964	2.400458	0	<5
Chinworth	OCS2	9/2/2009	5	6	1.4519	2.362422	0	<5
Chinworth	OCS2	9/2/2009	5	9	1.51306	1.468547	0	<5
Chinworth	OCS2	9/2/2009	5	10	1.70386	1.33579	0	<5
Chinworth	OCS2	9/2/2009	5	1	2.02114	0.977666	0	<5
CR 100	CS1	9/2/2009	3	1	1.79576	NA	1	109.2706
CR 100	CS1	9/2/2009	3	3	1.71648	1.378402	1	17.97741
CR 100	CS1	9/2/2009	3	9	1.57388	1.138587	1	45.27608
CR 100	CS1	9/2/2009	3	7	1.92892	1.108392	1	NA
CR 100	CS1	9/2/2009	3	5	2.01936	0.784407	1	40.91311
CR 100	CS1	9/2/2009	3	8	1.90748	0.731856	1	116.6717
CR 100	CS1	9/2/2009	3	2	2.12008	0.56696	1	67.35469
CR 100	CS1	9/2/2009	3	6	2.0044	0.552784	1	17.50394
CR 100	CS1	9/2/2009	3	10	1.946	0.546763	1	88.96527
CR 100	CS1	9/2/2009	3	4	1.96194	0.517855	1	126.9423
CR 300	OCS1	9/2/2009	6	8	1.96824	1.040524	0	80.73037

CR 300	OCS1	9/2/2009	6	9	1.69892	0.912344	0	142.5102
CR 300	OCS1	9/2/2009	6	6	1.89488	0.79794	0	36.7173
CR 300	OCS1	9/2/2009	6	5	2.13344	0.740588	0	<5
CR 300	OCS1	9/2/2009	6	7	2.15586	0.712477	0	19.86742
CR 300	OCS1	9/2/2009	6	3	2.09974	0.684847	0	40.93563
CR 300	OCS1	9/2/2009	6	2	2.27414	0.663108	0	<5
CR 300	OCS1	9/2/2009	6	10	2.07808	0.552433	0	54.06684
CR 300	OCS1	9/2/2009	6	1	2.2433	0.488566	0	10.88824
CR 300	OCS1	9/2/2009	6	4	2.04604	0.477019	0	25.23875
PWP	CS3	9/2/2009	2	8	1.51724	1.953547	1	<5
PWP	CS3	9/2/2009	2	3	1.43608	1.680965	1	<5
PWP	CS3	9/2/2009	2	1	1.32052	1.307061	1	<5
PWP	CS3	9/2/2009	2	9	1.469	1.307012	1	<5
PWP	CS3	9/2/2009	2	5	1.40252	1.257736	1	<5
PWP	CS3	9/2/2009	2	2	1.56052	1.232922	1	<5
PWP	CS3	9/2/2009	2	6	1.4404	0.967787	1	<5
PWP	CS3	9/2/2009	2	4	1.4937	0.858271	1	191.5922
PWP	CS3	9/2/2009	2	7	1.5905	0.809808	1	46.29367
PWP	CS3	9/2/2009	2	10	1.60074	0.634706	1	30.35819
20th Rd	OCS3	#####	4	7	1.95238	1.517123	0	<5
20th Rd	OCS3	#####	4	5	1.81942	1.368568	0	<5
20th Rd	OCS3	#####	4	8	1.96842	1.348289	0	<5
20th Rd	OCS3	#####	4	10	1.97586	1.329042	0	<5
20th Rd	OCS3	#####	4	2	1.95658	1.062057	0	<5
20th Rd	OCS3	#####	4	1	1.98238	0.955417	0	<5
20th Rd	OCS3	#####	4	3	1.89268	0.930955	0	<5
20th Rd	OCS3	#####	4	6	2.08788	0.929172	0	<5
20th Rd	OCS3	#####	4	4	1.84312	0.877859	0	<5
20th Rd	OCS3	#####	4	9	1.9406	0.873957	0	<5
Chinworth	OCS2	#####	5	2	1.47238	2.36352	0	<5
Chinworth	OCS2	#####	5	7	1.79628	2.157793	0	<5
Chinworth	OCS2	#####	5	1	1.6806	1.62561	0	<5
Chinworth	OCS2	#####	5	10	1.92272	1.322085	0	<5
Chinworth	OCS2	#####	5	9	1.9864	1.309907	0	<5
Chinworth	OCS2	#####	5	4	1.85336	1.222644	0	<5
Chinworth	OCS2	#####	5	6	1.95558	1.108623	0	<5
Chinworth	OCS2	#####	5	3	2.00408	1.082791	0	<5
Chinworth	OCS2	#####	5	5	2.05302	0.988787	0	<5
Chinworth	OCS2	#####	5	8	1.89114	0.751927	0	<5
CR 100	CS1	#####	3	6	1.7515	NA	1	216.6238
CR 100	CS1	#####	3	7	1.76692	1.40244	1	<5
CR 100	CS1	#####	3	10	1.86698	1.180516	1	24.54475
CR 100	CS1	#####	3	9	1.81488	1.136163	1	171.3334
CR 100	CS1	#####	3	5	2.05704	0.94602	1	42.78198
CR 100	CS1	#####	3	1	1.8691	0.781125	1	78.94616
CR 100	CS1	#####	3	2	2.04032	0.609708	1	82.09326
CR 100	CS1	#####	3	3	1.66648	0.607268	1	115.5642

CR 100	CS1	#####	3	8	1.7864	0.588894	1	72.26204
CR 100	CS1	#####	3	4	2.05898	0.552701	1	11.29882
CR 300	OCS1	#####	6	9	2.17374	1.071885	0	66.52005
CR 300	OCS1	#####	6	2	1.8711	1.033617	0	<5
CR 300	OCS1	#####	6	5	2.27268	0.989141	0	44.87204
CR 300	OCS1	#####	6	6	2.13966	0.902012	0	39.42701
CR 300	OCS1	#####	6	4	2.22134	0.737393	0	<5
CR 300	OCS1	#####	6	7	2.00348	0.731727	0	17.64585
CR 300	OCS1	#####	6	3	1.89102	0.726592	0	17.33851
CR 300	OCS1	#####	6	10	2.47866	0.714902	0	14.93353
CR 300	OCS1	#####	6	1	1.89954	0.552765	0	<5
CR 300	OCS1	#####	6	8	2.21182	0.518125	0	<5
PWP	CS3	#####	2	5	1.45946	2.466666	1	<5
PWP	CS3	#####	2	2	1.5055	1.660578	1	<5
PWP	CS3	#####	2	10	1.9977	1.53877	1	18.61059
PWP	CS3	#####	2	3	1.60496	1.313428	1	<5
PWP	CS3	#####	2	9	2.04138	1.184493	1	11.09341
PWP	CS3	#####	2	6	1.88268	1.054879	1	<5
PWP	CS3	#####	2	1	1.64172	0.967278	1	<5
PWP	CS3	#####	2	7	1.84556	0.951473	1	<5
PWP	CS3	#####	2	8	2.02222	0.778353	1	<5
PWP	CS3	#####	2	4	1.5981	0.712096	1	<5
CR 700	CS2	#####	1	8	1.44808	1.785813	1	63.14348
CR 700	CS2	#####	1	7	1.85124	1.486571	1	57.7511
CR 700	CS2	#####	1	1	1.64144	1.384151	1	30.15643
CR 700	CS2	#####	1	2	1.8705	1.138733	1	34.31402
CR 700	CS2	#####	1	9	1.92704	1.12089	1	188.0384
CR 700	CS2	#####	1	5	1.92514	0.981747	1	158.3657
CR 700	CS2	#####	1	6	1.97546	0.938516	1	70.46562
CR 700	CS2	#####	1	10	1.79818	0.834177	1	69.00671
CR 700	CS2	#####	1	3	2.23476	0.682847	1	75.5794
CR 700	CS2	#####	1	4	1.79526	0.667313	1	<5
20th Rd	OCS3	#####	4	8	1.98724	1.274129	0	<5
20th Rd	OCS3	#####	4	5	2.0589	1.1511	0	<5
20th Rd	OCS3	#####	4	3	1.82352	1.119812	0	<5
20th Rd	OCS3	#####	4	9	1.95	1.058462	0	<5
20th Rd	OCS3	#####	4	2	1.96246	0.967153	0	<5
20th Rd	OCS3	#####	4	10	2.10198	0.915327	0	<5
20th Rd	OCS3	#####	4	7	1.86926	0.901961	0	<5
20th Rd	OCS3	#####	4	4	2.12148	0.899372	0	<5
20th Rd	OCS3	#####	4	1	2.09004	0.88228	0	<5
20th Rd	OCS3	#####	4	6	1.99088	0.772523	0	<5
CR 100	CS1	#####	3	7	1.87222	2.29567	1	<5
CR 100	CS1	#####	3	3	1.76454	0.843279	1	53.0257
CR 100	CS1	#####	3	5	2.01984	0.775309	1	<5
CR 100	CS1	#####	3	6	1.97754	0.772677	1	<5
CR 100	CS1	#####	3	2	1.92864	0.692716	1	<5

CR 100	CS1	#####	3	4	1.8402	0.624932	1 <5
CR 100	CS1	#####	3	9	1.9228	0.62409	1 28.5545
CR 100	CS1	#####	3	8	1.87528	0.605776	1 <5
CR 100	CS1	#####	3	10	2.0094	0.600179	1 6.332
CR 100	CS1	#####	3	1	2.00232	0.499421	1 <5
CR 700	CS2	#####	1	9	1.57718	2.160819	1 <5
CR 700	CS2	#####	1	2	1.51392	1.976326	1 26.91785
CR 700	CS2	#####	1	8	1.80976	1.961586	1 19.65815
CR 700	CS2	#####	1	4	1.8621	1.199721	1 155.2336
CR 700	CS2	#####	1	10	2.01506	1.146368	1 7.21245
CR 700	CS2	#####	1	5	2.00542	1.107997	1 36.4966
CR 700	CS2	#####	1	1	2.0344	1.098112	1 <5
CR 700	CS2	#####	1	7	1.93224	1.058875	1 4.93865
CR 700	CS2	#####	1	6	2.18052	1.026361	1 50.73525
CR 700	CS2	#####	1	3	1.9607	0.9313	1 10.239
PWP	CS3	#####	2	1	1.42142	1.547748	1 <5
PWP	CS3	#####	2	7	2.01952	0.999247	1 38.1183
PWP	CS3	#####	2	10	1.659	0.992164	1 <5
PWP	CS3	#####	2	4	1.61634	0.955245	1 <5
PWP	CS3	#####	2	8	1.75174	0.92137	1 <5
PWP	CS3	#####	2	6	1.7419	0.874907	1 <5
PWP	CS3	#####	2	9	1.97116	0.802573	1 <5
PWP	CS3	#####	2	2	1.50786	0.76267	1 <5
PWP	CS3	#####	2	3	1.6316	0.746506	1 <5
PWP	CS3	#####	2	5	1.6941	0.68591	1 <5
Chinworth	OCS2	#####	5	3	1.66342	1.552224	0 <5
Chinworth	OCS2	#####	5	4	2.04482	1.373226	0 <5
Chinworth	OCS2	#####	5	10	2.07374	1.247022	0 NA
Chinworth	OCS2	#####	5	2	1.9245	1.240842	0 <5
Chinworth	OCS2	#####	5	7	1.83024	1.165967	0 <5
Chinworth	OCS2	#####	5	6	1.72528	1.120977	0 <5
Chinworth	OCS2	#####	5	5	1.79158	1.066098	0 <5
Chinworth	OCS2	#####	5	9	2.07182	0.981746	0 <5
Chinworth	OCS2	#####	5	8	1.97542	0.968908	0 <5
Chinworth	OCS2	#####	5	1	1.77438	0.945682	0 <5
CR 300	OCS1	#####	6	7	1.83352	2.59719	0 23.6404
CR 300	OCS1	#####	6	8	1.94312	1.374079	0 36.7187
CR 300	OCS1	#####	6	9	1.90796	1.000021	0 110.3008
CR 300	OCS1	#####	6	3	1.78888	0.815035	0 2.5622
CR 300	OCS1	#####	6	6	2.09556	0.706255	0 41.9792
CR 300	OCS1	#####	6	2	2.04242	0.683503	0 48.41115
CR 300	OCS1	#####	6	1	1.86958	0.678227	0 74.6739
CR 300	OCS1	#####	6	10	2.02318	0.649473	0 2.2167
CR 300	OCS1	#####	6	5	1.93728	0.648332	0 64.6648
CR 300	OCS1	#####	6	4	1.94298	0.351007	0 47.66895
PWP	CS3	#####	2	10	1.95102	3.230105	1 <5
PWP	CS3	#####	2	9	1.736	2.186636	1 <5

PWP	CS3	#####	2	4	1.6443	2.134647	1 <5
PWP	CS3	#####	2	6	1.41586	1.906968	1 <5
PWP	CS3	#####	2	3	1.05754	1.847684	1 <5
PWP	CS3	#####	2	8	1.72436	1.529843	1 <5
PWP	CS3	#####	2	1	1.8085	1.381255	1 <5
PWP	CS3	#####	2	2	1.7573	1.212087	1 <5
PWP	CS3	#####	2	7	1.4676	1.129736	1 <5
PWP	CS3	#####	2	5	1.41446	1.11562	1 <5
Chinworth	OCS2	#####	5	7	1.30216	4.601585	0 <10
Chinworth	OCS2	#####	5	5	2.3384	4.269586	0 <10
Chinworth	OCS2	#####	5	1	1.87886	3.395676	0 <10
Chinworth	OCS2	#####	5	4	1.83314	2.724287	0 <10
Chinworth	OCS2	#####	5	2	1.58204	2.535966	0 <10
Chinworth	OCS2	#####	5	6	1.89854	1.758193	0 <10
Chinworth	OCS2	#####	5	10	1.91446	1.73626	0 <10
Chinworth	OCS2	#####	5	9	2.40788	1.546589	0 <10
Chinworth	OCS2	#####	5	8	2.7444	1.496138	0 <10
Chinworth	OCS2	#####	5	3	2.27442	1.104457	0 <10
CR 100	CS1	#####	3	5	2.30372	1.502787	1 75.48745
CR 100	CS1	#####	3	7	2.49964	1.230577	1 30.55778
CR 100	CS1	#####	3	1	2.2796	1.211616	1 93.35293
CR 100	CS1	#####	3	6	2.44222	1.197271	1 22.77186
CR 100	CS1	#####	3	4	3.00876	1.16194	1 13.7037
CR 100	CS1	#####	3	10	2.63994	1.075782	1 36.65992
CR 100	CS1	#####	3	2	2.19694	1.047821	1 95.39098
CR 100	CS1	#####	3	3	2.20712	1.034833	1 50.55892
CR 100	CS1	#####	3	8	1.99406	0.951827	1 87.04384
CR 100	CS1	#####	3	9	2.15746	0.656327	1 <5
CR 300	OCS1	#####	6	9	2.04198	1.487772	0 37.54063
CR 300	OCS1	#####	6	10	2.75562	1.407306	0 16.80564
CR 300	OCS1	#####	6	8	2.31206	1.17817	0 <5
CR 300	OCS1	#####	6	6	2.88108	1.130826	0 39.68905
CR 300	OCS1	#####	6	1	2.71944	0.99947	0 25.08093
CR 300	OCS1	#####	6	4	2.34088	0.964595	0 5.97978
CR 300	OCS1	#####	6	3	2.96956	0.938186	0 49.68689
CR 300	OCS1	#####	6	2	2.34092	0.810792	0 66.45636
CR 300	OCS1	#####	6	5	2.05878	0.768416	0 <5
CR 300	OCS1	#####	6	7	2.38328	0.720855	0 5.626171
20th Rd	OCS3	7/8/2010	4	4	1.789338	5.344722	0 <5
20th Rd	OCS3	7/8/2010	4	5	2.93677	3.700057	0 86.14631
20th Rd	OCS3	7/8/2010	4	8	2.513297	1.820049	0 65.95845
20th Rd	OCS3	7/8/2010	4	6	2.583568	1.75067	0 162.3213
20th Rd	OCS3	7/8/2010	4	7	2.890284	1.383012	0 119.8327
20th Rd	OCS3	7/8/2010	4	10	2.7245	1.361519	0 21.18634
20th Rd	OCS3	7/8/2010	4	9	2.578514	1.328547	0 60.69844
20th Rd	OCS3	7/8/2010	4	3	2.867284	1.279109	0 <5
20th Rd	OCS3	7/8/2010	4	1	2.689514	1.25211	0 27.0461

20th Rd	OCS3	7/8/2010	4	2	2.328568	1.207679	0	<5
Chinworth	OCS2	7/8/2010	5	6	1.50068	2.079057	0	<5
Chinworth	OCS2	7/8/2010	5	8	1.51038	1.963744	0	21.46194
Chinworth	OCS2	7/8/2010	5	10	1.72658	1.568418	0	<5
Chinworth	OCS2	7/8/2010	5	2	1.90132	1.521049	0	98.86806
Chinworth	OCS2	7/8/2010	5	1	1.59952	1.369161	0	25.80255
Chinworth	OCS2	7/8/2010	5	7	1.77304	1.319767	0	62.51654
Chinworth	OCS2	7/8/2010	5	4	1.87548	1.207158	0	7.560921
Chinworth	OCS2	7/8/2010	5	3	1.9113	1.034898	0	13.67327
Chinworth	OCS2	7/8/2010	5	5	1.67204	0.993995	0	<5
Chinworth	OCS2	7/8/2010	5	9	1.66334	0.913824	0	<5
CR 100	CS1	7/8/2010	3	4	2.150905	1.068061	1	38.37196
CR 100	CS1	7/8/2010	3	10	2.580392	1.00917	1	11.45866
CR 100	CS1	7/8/2010	3	6	2.284149	0.938312	1	127.4394
CR 100	CS1	7/8/2010	3	7	2.297824	0.916848	1	95.37292
CR 100	CS1	7/8/2010	3	3	2.6225	0.904336	1	60.9956
CR 100	CS1	7/8/2010	3	8	2.792595	0.89087	1	46.5328
CR 100	CS1	7/8/2010	3	2	2.205392	0.83824	1	132.6601
CR 100	CS1	7/8/2010	3	1	2.278635	0.762666	1	187.4054
CR 100	CS1	7/8/2010	3	9	2.731514	0.751489	1	62.13281
CR 100	CS1	7/8/2010	3	5	2.2225	0.586751	1	82.45286
CR 300	OCS1	7/8/2010	6	5	2.06046	1.957815	0	43.83926
CR 300	OCS1	7/8/2010	6	9	2.02808	1.260305	0	142.4858
CR 300	OCS1	7/8/2010	6	6	2.29784	0.990495	0	90.62293
CR 300	OCS1	7/8/2010	6	8	2.13976	0.94777	0	137.1885
CR 300	OCS1	7/8/2010	6	2	2.1026	0.807572	0	86.43285
CR 300	OCS1	7/8/2010	6	3	2.09736	0.760003	0	116.891
CR 300	OCS1	7/8/2010	6	4	1.92748	0.591446	0	31.19461
CR 300	OCS1	7/8/2010	6	1	1.88062	0.548755	0	54.06762
CR 300	OCS1	7/8/2010	6	10	2.127568	0.485264	0	129.7293
CR 300	OCS1	7/8/2010	6	7	2.01496	0.429785	0	29.78479
CR 700	CS2	7/8/2010	1	6	1.29042	NA	1	185.1936
CR 700	CS2	7/8/2010	1	1	2.238122	1.866913	1	143.8264
CR 700	CS2	7/8/2010	1	9	2.47344	1.522576	1	196.2262
CR 700	CS2	7/8/2010	1	5	1.80436	1.497484	1	151.5037
CR 700	CS2	7/8/2010	1	7	2.44862	1.493903	1	132.5177
CR 700	CS2	7/8/2010	1	2	2.200392	1.360323	1	131.419
CR 700	CS2	7/8/2010	1	3	2.36473	1.340648	1	217.6185
CR 700	CS2	7/8/2010	1	8	2.39882	1.32982	1	106.8285
CR 700	CS2	7/8/2010	1	10	2.15482	1.307766	1	187.9177
CR 700	CS2	7/8/2010	1	4	1.81046	0.3767	1	190.6779
PWP	CS3	7/8/2010	2 5b	NA	NA		1	64.99717
PWP	CS3	7/8/2010	2 5a	NA	NA		1	82.5342
PWP	CS3	7/8/2010	2	9	2.081662	1.105535	1	87.42761
PWP	CS3	7/8/2010	2	1	1.735581	0.903973	1	29.57047
PWP	CS3	7/8/2010	2	3	2.141135	0.806594	1	52.55746
PWP	CS3	7/8/2010	2	8	2.101203	0.776904	1	60.62323

PWP	CS3	7/8/2010	2	5	2.347122	0.711625	1 NA
PWP	CS3	7/8/2010	2	6	2.351919	0.650418	1 89.55553
PWP	CS3	7/8/2010	2	7	2.309095	0.629707	1 89.31721
PWP	CS3	7/8/2010	2	4	1.983541	0.588628	1 112.6642
PWP	CS3	7/8/2010	2	2	2.247892	0.501371	1 43.75768
PWP	CS3	7/8/2010	2	10	1.820216	0.297707	1 64.83439
Chinworth	OCS2	#####	5	10	1.39832	2.421477	0 <5
Chinworth	OCS2	#####	5	4	2.07298	1.772328	0 <5
Chinworth	OCS2	#####	5	6	2.0456	1.18596	0 <5
Chinworth	OCS2	#####	5	9	2.30376	1.114699	0 <5
Chinworth	OCS2	#####	5	3	2.51016	0.999139	0 <5
Chinworth	OCS2	#####	5	1	2.23216	0.960505	0 <5
Chinworth	OCS2	#####	5	2	2.50572	0.957809	0 <5
Chinworth	OCS2	#####	5	8	2.01096	0.946811	0 <5
Chinworth	OCS2	#####	5	5	2.20616	0.935562	0 <5
Chinworth	OCS2	#####	5	7	1.99722	0.865203	0 10.57823
CR 100	CS1	#####	3	3	2.17862	1.129155	1 12.78119
CR 100	CS1	#####	3	6	2.06678	0.901886	1 <5
CR 100	CS1	#####	3	8	2.78314	0.845807	1 27.79533
CR 100	CS1	#####	3	7	1.86692	0.703833	1 <5
CR 100	CS1	#####	3	1	1.82644	0.532183	1 23.65398
CR 100	CS1	#####	3	10	2.66554	0.514717	1 <5
CR 100	CS1	#####	3	2	1.90978	0.429369	1 22.95473
CR 100	CS1	#####	3	5	2.09096	0.393121	1 79.29408
CR 100	CS1	#####	3	4	2.12584	0.381967	1 5.731367
CR 100	CS1	#####	3	9	2.5058	0.341607	1 75.90363
CR 300	OCS1	#####	6	10	2.24758	1.075824	0 45.9813
CR 300	OCS1	#####	6	6	2.30988	0.626007	0 <5
CR 300	OCS1	#####	6	5	2.22116	0.612293	0 <5
CR 300	OCS1	#####	6	4	2.52076	0.580777	0 37.4038
CR 300	OCS1	#####	6	9	2.46598	0.553938	0 105.1096
CR 300	OCS1	#####	6	8	2.29726	0.528456	0 202.0793
CR 300	OCS1	#####	6	1	2.29268	0.50683	0 130.6661
CR 300	OCS1	#####	6	2	2.47896	0.497789	0 190.9476
CR 300	OCS1	#####	6	7	2.08102	0.493989	0 156.1827
CR 300	OCS1	#####	6	3	2.28764	0.384676	0 NA
CR 700	CS2	#####	1	5	2.2219	3.412395	1 204.4818
CR 700	CS2	#####	1	9	2.15268	1.237527	1 164.9374
CR 700	CS2	#####	1	3	2.19998	1.199102	1 123.2827
CR 700	CS2	#####	1	8	2.1925	1.190422	1 140.974
CR 700	CS2	#####	1	2	1.8337	1.146316	1 232.2261
CR 700	CS2	#####	1	7	2.22032	1.135872	1 53.38172
CR 700	CS2	#####	1	10	2.25012	0.964393	1 85.63917
CR 700	CS2	#####	1	4	2.0918	0.956114	1 273.5157
CR 700	CS2	#####	1	6	2.17544	0.923032	1 164.0438
CR 700	CS2	#####	1	1	2.12578	0.805351	1 103.7446
20th Rd	OCS3	#####	4	9	1.58028	2.133799	0 <5

20th Rd	OCS3	#####	4	6	1.82058	1.998264	0 <5
20th Rd	OCS3	#####	4	2	1.64522	1.976635	0 <5
20th Rd	OCS3	#####	4	5	1.90062	1.733119	0 <5
20th Rd	OCS3	#####	4	1	1.9532	1.34446	0 40.32398
20th Rd	OCS3	#####	4	10	1.80978	1.323918	0 <5
20th Rd	OCS3	#####	4	7	1.90608	1.182532	0 <5
20th Rd	OCS3	#####	4	8	1.9269	1.087758	0 <5
20th Rd	OCS3	#####	4	4	1.8963	0.935506	0 <5
20th Rd	OCS3	#####	4	3	1.86558	0.878011	0 <5
PWP	CS3	#####	2	9	1.33088	2.505109	1 <5
PWP	CS3	#####	2	6	1.49442	1.964642	1 <5
PWP	CS3	#####	2	10	1.53332	1.656536	1 <5
PWP	CS3	#####	2	8	1.5021	1.44065	1 <5
PWP	CS3	#####	2	7	1.56952	1.030888	1 <5
PWP	CS3	#####	2	1	1.84238	0.809822	1 4.100378
PWP	CS3	#####	2	4	1.8653	0.806305	1 <5
PWP	CS3	#####	2	5	1.86388	0.79297	1 <5
PWP	CS3	#####	2	3	1.79396	0.765903	1 53.79503
PWP	CS3	#####	2	2	1.91426	0.700009	1 23.01202
20th Rd	OCS3	8/4/2010	4	4	1.50934	2.385148	0 <5
20th Rd	OCS3	8/4/2010	4	8	1.8383	1.796225	0 <5
20th Rd	OCS3	8/4/2010	4	7	1.86124	1.761191	0 <5
20th Rd	OCS3	8/4/2010	4	9	1.87356	1.452849	0 <5
20th Rd	OCS3	8/4/2010	4	3	1.86294	1.086455	0 <5
20th Rd	OCS3	8/4/2010	4	5	2.03962	1.073729	0 <5
20th Rd	OCS3	8/4/2010	4	6	2.49428	0.97904	0 7.366119
20th Rd	OCS3	8/4/2010	4	2	2.45742	0.952218	0 <5
20th Rd	OCS3	8/4/2010	4	10	2.43406	0.822494	0 22.17047
20th Rd	OCS3	8/4/2010	4	1	2.0918	0.73334	0 <5
Chinworth	OCS2	8/4/2010	5	4	1.29508	3.581246	0 274.9632
Chinworth	OCS2	8/4/2010	5	6	1.92838	1.997532	0 1104.423
Chinworth	OCS2	8/4/2010	5	5	1.7068	1.62292	0 <5
Chinworth	OCS2	8/4/2010	5	7	1.72698	1.462669	0 <5
Chinworth	OCS2	8/4/2010	5	3	1.5565	1.403148	0 1005.965
Chinworth	OCS2	8/4/2010	5	9	1.81294	1.340364	0 <5
Chinworth	OCS2	8/4/2010	5	8	2.001	1.309345	0 <5
Chinworth	OCS2	8/4/2010	5	10	2.18128	1.173623	0 <5
Chinworth	OCS2	8/4/2010	5	2	2.1173	1.14391	0 <5
Chinworth	OCS2	8/4/2010	5	1	2.1901	1.021871	0 <5
CR 100	CS1	8/4/2010	3	4	1.73816	1.372716	1 145.8599
CR 100	CS1	8/4/2010	3	6	2.00998	1.099513	1 65.26051
CR 100	CS1	8/4/2010	3	10	2.39598	1.064283	1 25.57255
CR 100	CS1	8/4/2010	3	3	1.94098	0.997434	1 168.2039
CR 100	CS1	8/4/2010	3	7	1.62116	0.993116	1 191.8063
CR 100	CS1	8/4/2010	3	8	1.99262	0.970581	1 26.24994
CR 100	CS1	8/4/2010	3	9	2.27752	0.931715	1 24.09639
CR 100	CS1	8/4/2010	3	2	2.13746	0.669018	1 151.4959

CR 100	CS1	8/4/2010	3	5	2.02146	0.668824	1 <5
CR 100	CS1	8/4/2010	3	1	2.06542	0.622634	1 20.20082
CR 300	OCS1	8/4/2010	6	3	2.12442	2.602122	0 57.63715
CR 300	OCS1	8/4/2010	6	1	2.19194	1.45077	0 <5
CR 300	OCS1	8/4/2010	6	7	1.99242	1.384246	0 168.5794
CR 300	OCS1	8/4/2010	6	8	2.04356	1.144082	0 191.9305
CR 300	OCS1	8/4/2010	6	6	1.93002	0.995845	0 212.2184
CR 300	OCS1	8/4/2010	6	10	1.97652	0.928905	0 299.6251
CR 300	OCS1	8/4/2010	6	9	2.47978	0.888789	0 200.9007
CR 300	OCS1	8/4/2010	6	5	2.40256	0.836608	0 137.086
CR 300	OCS1	8/4/2010	6	2	2.31712	0.82171	0 <5
CR 300	OCS1	8/4/2010	6	4	2.15372	0.784689	0 229.6027
CR 700	CS2	8/4/2010	1	1	2.1436	2.025564	1 99.12268
CR 700	CS2	8/4/2010	1	3	1.97008	1.609072	1 116.1123
CR 700	CS2	8/4/2010	1	5	1.96902	1.498207	1 119.9038
CR 700	CS2	8/4/2010	1	10	2.07742	1.403664	1 130.1241
CR 700	CS2	8/4/2010	1	4	1.66978	1.297177	1 80.61129
CR 700	CS2	8/4/2010	1	8	2.36314	1.261034	1 286.0091
CR 700	CS2	8/4/2010	1	9	2.22254	1.05105	1 116.9531
CR 700	CS2	8/4/2010	1	7	2.08994	0.93017	1 181.9343
CR 700	CS2	8/4/2010	1	6	2.14166	0.85261	1 68.3332
CR 700	CS2	8/4/2010	1	2	1.96626	0.749647	1 200.7717
PWP	CS3	8/4/2010	2	3	1.43192	1.236103	1 <5
PWP	CS3	8/4/2010	2	4	1.79214	1.028937	1 <5
PWP	CS3	8/4/2010	2	5	1.98958	1.025342	1 <5
PWP	CS3	8/4/2010	2	1	1.763	0.77595	1 <5
PWP	CS3	8/4/2010	2	2	1.57794	0.732601	1 <5
PWP	CS3	8/4/2010	2	8	1.87294	0.716521	1 126.0948
PWP	CS3	8/4/2010	2	6	1.72964	0.664878	1 28.3092
PWP	CS3	8/4/2010	2	9	1.84656	0.589204	1 55.6595
PWP	CS3	8/4/2010	2	7	2.0374	0.575243	1 83.23511
PWP	CS3	8/4/2010	2	10	1.7608	0.480463	1 75.43154
20th Rd	OCS3	#####	4	4	1.66272	1.703233	0 <5
20th Rd	OCS3	#####	4	2	1.93512	1.476911	0 39.69729
20th Rd	OCS3	#####	4	8	1.83838	1.389267	0 <5
20th Rd	OCS3	#####	4	9	1.90368	1.383636	0 59.58894
20th Rd	OCS3	#####	4	5	2.05218	1.337115	0 <5
20th Rd	OCS3	#####	4	7	2.00124	1.310188	0 <5
20th Rd	OCS3	#####	4	3	1.96948	1.224689	0 <5
20th Rd	OCS3	#####	4	10	1.97464	1.117166	0 170.0547
20th Rd	OCS3	#####	4	1	1.77018	1.106102	0 <5
20th Rd	OCS3	#####	4	6	1.85692	1.005967	0 12.73814
PWP	CS3	#####	2	5	1.40782	3.131082	1 <5
PWP	CS3	#####	2	3	1.48072	2.148955	1 <5
PWP	CS3	#####	2	10	1.78752	1.517186	1 88.53141
PWP	CS3	#####	2	4	1.42906	1.517081	1 <5
PWP	CS3	#####	2	8	1.74874	1.203152	1 414.7587

PWP	CS3	#####	2	9	1.75518	0.952609	1	354.2028
PWP	CS3	#####	2	1	1.48502	0.900998	1	152.4811
PWP	CS3	#####	2	7	1.81838	0.845808	1	52.70129
PWP	CS3	#####	2	6	1.76146	0.715316	1	419.4469
PWP	CS3	#####	2	2	1.49488	0.338489	1	177.64
CR 100	CS1	#####	3	6	1.96994	1.648781	1	10.18164
CR 100	CS1	#####	3	8	1.909	1.168151	1	144.2196
CR 100	CS1	#####	3	9	1.93148	1.11003	1	319.8476
CR 100	CS1	#####	3	1	1.717	1.01922	1	132.0396
CR 100	CS1	#####	3	10	1.95006	0.860486	1	41.58861
CR 100	CS1	#####	3	5	1.79974	0.825675	1	126.2075
CR 100	CS1	#####	3	7	1.86774	0.818101	1	270.7894
CR 100	CS1	#####	3	3	1.94298	0.798773	1	241.3839
CR 100	CS1	#####	3	4	1.94012	0.707173	1	224.2549
CR 100	CS1	#####	3	2	1.79566	0.656026	1	101.2211
CR 300	OCS1	#####	6	8	1.7434	1.35253	0	231.6252
CR 300	OCS1	#####	6	10	1.7205	1.096193	0	121.1974
CR 300	OCS1	#####	6	2	1.89152	1.07744	0	113.6601
CR 300	OCS1	#####	6	6	1.81496	1.075506	0	274.245
CR 300	OCS1	#####	6	7	1.92642	0.9894	0	219.3525
CR 300	OCS1	#####	6	5	1.76588	0.968356	0	402.112
CR 300	OCS1	#####	6	4	1.81402	0.958093	0	252.1414
CR 300	OCS1	#####	6	3	1.86912	0.931989	0	280.9519
CR 300	OCS1	#####	6	9	1.79332	0.89443	0	268.7824
CR 300	OCS1	#####	6	1	1.61916	0.757183	0	280.1701
Chinworth	OCS2	#####	5	7	1.49218	1.793349	0	<5
Chinworth	OCS2	#####	5	8	1.65002	1.670283	0	<5
Chinworth	OCS2	#####	5	1	1.47512	1.537502	0	<5
Chinworth	OCS2	#####	5	4	1.42568	1.470176	0	<5
Chinworth	OCS2	#####	5	10	1.5327	1.342729	0	<5
Chinworth	OCS2	#####	5	6	1.75312	1.160217	0	14.87538
Chinworth	OCS2	#####	5	2	1.53848	1.117987	0	<5
Chinworth	OCS2	#####	5	3	1.66914	1.049642	0	<5
Chinworth	OCS2	#####	5	5	1.56716	0.966079	0	5.85738
Chinworth	OCS2	#####	5	9	1.58638	0.916552	0	54.65018
CR 700	CS2	#####	1	6	1.79302	1.697694	1	79.46496
CR 700	CS2	#####	1	7	1.79546	1.29549	1	185.1722
CR 700	CS2	#####	1	8	1.91136	1.290181	1	164.3839
CR 700	CS2	#####	1	2	1.81022	1.215322	1	222.2604
CR 700	CS2	#####	1	10	1.85636	1.173264	1	99.96287
CR 700	CS2	#####	1	4	1.67788	1.146685	1	199.2062
CR 700	CS2	#####	1	3	1.78216	1.144678	1	128.832
CR 700	CS2	#####	1	1	1.75344	1.115521	1	98.03822
CR 700	CS2	#####	1	5	1.72122	1.016721	1	190.6848
CR 700	CS2	#####	1	9	1.74612	0.682656	1	242.9601
20th Rd	OCS3	9/1/2010	4	9	1.84596	4.464885	0	81.26473
20th Rd	OCS3	9/1/2010	4	6	1.73696	1.61892	0	198.5953

20th Rd	OCS3	9/1/2010	4	8	1.82346	1.334825	0 <5
20th Rd	OCS3	9/1/2010	4	1	1.85994	1.267783	0 233.2238
20th Rd	OCS3	9/1/2010	4	7	1.87552	1.235924	0 35.19177
20th Rd	OCS3	9/1/2010	4	3	1.81672	1.175745	0 138.2611
20th Rd	OCS3	9/1/2010	4	10	1.92958	1.170203	0 14.49066
20th Rd	OCS3	9/1/2010	4	2	1.9447	1.076773	0 136.0028
20th Rd	OCS3	9/1/2010	4	4	1.9293	1.008656	0 296.6488
20th Rd	OCS3	9/1/2010	4	5	1.85942	0.850803	0 215.5123
CR 100	CS1	9/1/2010	3	8	1.98252	1.745254	1 321.6994
CR 100	CS1	9/1/2010	3	9	1.76716	1.16458	1 125.3375
CR 100	CS1	9/1/2010	3	10	1.90272	1.142575	1 77.29033
CR 100	CS1	9/1/2010	3	7	1.90788	1.005304	1 127.9877
CR 100	CS1	9/1/2010	3	3	2.00672	0.816257	1 218.8333
CR 100	CS1	9/1/2010	3	2	1.8984	0.754319	1 281.9428
CR 100	CS1	9/1/2010	3	6	1.84942	0.662911	1 294.234
CR 100	CS1	9/1/2010	3	1	1.9305	0.656825	1 281.5396
CR 100	CS1	9/1/2010	3	4	2.07226	0.618648	1 56.68914
CR 100	CS1	9/1/2010	3	5	1.91374	0.56434	1 242.4447
PWP	CS3	9/1/2010	2	6	1.4787	1.218638	1 <5
PWP	CS3	9/1/2010	2	3	1.7226	1.192384	1 <5
PWP	CS3	9/1/2010	2	8	1.82606	1.106207	1 263.2309
PWP	CS3	9/1/2010	2	4	1.90486	0.9775	1 417.3077
PWP	CS3	9/1/2010	2	5	1.70334	0.895887	1 <5
PWP	CS3	9/1/2010	2	9	1.78528	0.818919	1 551.4506
PWP	CS3	9/1/2010	2	10	1.76344	0.792769	1 669.899
PWP	CS3	9/1/2010	2	7	1.9271	0.759691	1 210.615
PWP	CS3	9/1/2010	2	2	1.65614	0.743898	1 1027.481
PWP	CS3	9/1/2010	2	1	1.75118	0.078804	1 301.2273
Chinworth	OCS2	9/2/2010	5	2	1.5229	2.162979	0 <5
Chinworth	OCS2	9/2/2010	5	9	1.65832	1.642626	0 <5
Chinworth	OCS2	9/2/2010	5	1	1.61164	1.579757	0 <5
Chinworth	OCS2	9/2/2010	5	4	1.68806	1.568665	0 120.9161
Chinworth	OCS2	9/2/2010	5	7	1.68364	1.470623	0 267.016
Chinworth	OCS2	9/2/2010	5	8	1.65154	1.402328	0 <5
Chinworth	OCS2	9/2/2010	5	10	1.89676	1.288513	0 <5
Chinworth	OCS2	9/2/2010	5	5	1.6241	1.217905	0 <5
Chinworth	OCS2	9/2/2010	5	3	1.61004	1.19997	0 <5
Chinworth	OCS2	9/2/2010	5	6	1.70912	0.989983	0 282.4028
CR 300	OCS1	9/2/2010	6	10	1.64754	1.201792	0 <5
CR 300	OCS1	9/2/2010	6	3	1.9102	1.189404	0 404.3876
CR 300	OCS1	9/2/2010	6	9	1.7585	1.069093	0 507.6036
CR 300	OCS1	9/2/2010	6	8	1.8673	1.051786	0 504.2886
CR 300	OCS1	9/2/2010	6	7	1.89834	1.040909	0 266.8176
CR 300	OCS1	9/2/2010	6	4	1.91156	0.967796	0 402.8309
CR 300	OCS1	9/2/2010	6	5	1.8423	0.956413	0 170.1573
CR 300	OCS1	9/2/2010	6	6	2.1174	0.784925	0 142.5862
CR 300	OCS1	9/2/2010	6	2	1.91732	0.753135	0 199.6564

CR 300	OCS1	9/2/2010	6	1	2.05612	0.544715	0	242.5245
CR 700	CS2	9/2/2010	1	3	1.8595	1.853186	1	352.1265
CR 700	CS2	9/2/2010	1	4	1.7587	1.401035	1	299.3576
CR 700	CS2	9/2/2010	1	7	1.95662	1.344155	1	293.5294
CR 700	CS2	9/2/2010	1	2	1.86328	1.286978	1	564.7259
CR 700	CS2	9/2/2010	1	5	1.61344	1.271817	1	417.4156
CR 700	CS2	9/2/2010	1	1	1.83976	0.953385	1	260.2656
CR 700	CS2	9/2/2010	1	9	1.84584	0.952412	1	233.5702
CR 700	CS2	9/2/2010	1	6	1.85714	0.871232	1	365.2817
CR 700	CS2	9/2/2010	1	8	1.9578	0.85402	1	356.5209
CR 700	CS2	9/2/2010	1	10	1.81332	0.733461	1	296.9293
CR 100	CS1	#####	3	8	NA	NA	1	145.4641
CR 100	CS1	#####	3	6	1.7195	NA	1	182.7287
CR 100	CS1	#####	3	7	2.02994	4.141994	1	54.15737
CR 100	CS1	#####	3	4	1.85494	1.17524	1	111.92
CR 100	CS1	#####	3	2	1.791	1.037409	1	148.1028
CR 100	CS1	#####	3	1	1.8996	0.839124	1	222.7483
CR 100	CS1	#####	3	3	1.71918	0.738724	1	156.7844
CR 100	CS1	#####	3	5	1.60216	0.4444	1	169.3889
Chinworth	OCS2	#####	5	2	1.61112	1.797507	0	<5
Chinworth	OCS2	#####	5	3	1.65404	1.580373	0	<5
Chinworth	OCS2	#####	5	4	1.6462	1.457903	0	59.07876
Chinworth	OCS2	#####	5	6	1.65416	1.209073	0	47.69466
Chinworth	OCS2	#####	5	8	1.66552	1.182814	0	<5
Chinworth	OCS2	#####	5	1	1.67886	1.174607	0	40.69092
Chinworth	OCS2	#####	5	7	1.61992	1.111166	0	<5
Chinworth	OCS2	#####	5	5	1.75114	1.062165	0	<5
CR 300	OCS1	#####	6	4	1.59678	1.430379	0	73.37546
CR 300	OCS1	#####	6	3	1.98242	0.915043	0	30.1774
CR 300	OCS1	#####	6	8	1.794	0.910814	0	74.60296
CR 300	OCS1	#####	6	1	1.7331	0.830881	0	265.2372
CR 300	OCS1	#####	6	7	1.92232	0.810479	0	113.4454
CR 300	OCS1	#####	6	5	1.82798	0.603945	0	78.2021
CR 300	OCS1	#####	6	2	1.88366	0.509646	0	165.5444
CR 300	OCS1	#####	6	6	1.8139	0.481835	0	154.7423
20th Rd	OCS3	#####	4	1	1.32068	2.956053	0	<5
20th Rd	OCS3	#####	4	2	1.617	2.103896	0	<5
20th Rd	OCS3	#####	4	4	1.70018	1.59042	0	142.6406
20th Rd	OCS3	#####	4	6	1.6553	1.484927	0	49.14151
20th Rd	OCS3	#####	4	8	1.844	1.175705	0	84.26693
20th Rd	OCS3	#####	4	5	1.85658	1.158043	0	82.3593
20th Rd	OCS3	#####	4	7	1.9286	1.054651	0	41.6627
20th Rd	OCS3	#####	4	3	1.87476	1.032666	0	<5
CR 700	CS2	#####	1	5	1.64334	1.511556	1	183.5763
CR 700	CS2	#####	1	7	1.76788	1.30665	1	206.2628
CR 700	CS2	#####	1	3	1.58448	1.249621	1	267.415
CR 700	CS2	#####	1	1	1.79468	1.045312	1	146.4567

CR 700	CS2	#####	1	6	1.77968	0.95298	1	143.7328
CR 700	CS2	#####	1	8	1.74016	0.932098	1	199.9358
CR 700	CS2	#####	1	2	1.70174	0.920235	1	215.2841
CR 700	CS2	#####	1	4	1.56376	0.911905	1	176.4267
PWP	CS3	#####	2	3	1.79988	3.123542	1	67.43108
PWP	CS3	#####	2	2	1.96584	1.36125	1	11.71976
PWP	CS3	#####	2	4	1.7329	1.202608	1	<5
PWP	CS3	#####	2	8	1.67344	1.067263	1	824.1049
PWP	CS3	#####	2	7	1.52846	1.023252	1	624.7879
PWP	CS3	#####	2	6	2.01656	1.005673	1	195.1745
PWP	CS3	#####	2	5	2.03074	0.859785	1	65.50224
PWP	CS3	#####	2	1	1.90552	0.834418	1	380.857
20th Rd	OCS3	#####	4	5	1.53332	1.698276	0	<5
20th Rd	OCS3	#####	4	4	1.60722	1.569169	0	<5
20th Rd	OCS3	#####	4	1	1.42984	1.506462	0	8.033082
20th Rd	OCS3	#####	4	7	1.65544	1.383318	0	<5
20th Rd	OCS3	#####	4	2	1.63428	1.322907	0	<5
20th Rd	OCS3	#####	4	3	1.70504	1.236335	0	<5
20th Rd	OCS3	#####	4	8	1.57724	1.141234	0	<5
20th Rd	OCS3	#####	4	6	1.74782	1.111098	0	<5
Chinworth	OCS2	#####	5	2	1.66866	NA	0	<5
Chinworth	OCS2	#####	5	3	1.40268	2.017566	0	<5
Chinworth	OCS2	#####	5	1	1.6968	1.643093	0	58.14758
Chinworth	OCS2	#####	5	4	1.5562	1.607762	0	<5
Chinworth	OCS2	#####	5	7	1.7138	1.603454	0	44.80719
Chinworth	OCS2	#####	5	8	1.53258	1.585562	0	100.5382
Chinworth	OCS2	#####	5	6	1.74102	1.179768	0	107.8047
Chinworth	OCS2	#####	5	5	1.80688	1.173293	0	<5
CR 100	CS1	#####	3	2	1.45112	1.361707	1	324.3185
CR 100	CS1	#####	3	4	1.84598	0.850497	1	115.309
CR 100	CS1	#####	3	6	2.03728	0.747075	1	138.4476
CR 100	CS1	#####	3	7	1.77012	0.639505	1	445.2249
CR 100	CS1	#####	3	1	1.8059	0.582535	1	374.7217
CR 100	CS1	#####	3	8	1.63338	0.553454	1	212.6279
CR 100	CS1	#####	3	3	1.65916	0.553292	1	461.4284
CR 100	CS1	#####	3	5	1.7389	0.484214	1	380.7304
CR 300	OCS1	#####	6	1	1.53866	1.108757	0	104.9216
CR 300	OCS1	#####	6	4	1.68818	1.008186	0	22.58098
CR 300	OCS1	#####	6	8	1.5575	0.879615	0	235.7083
CR 300	OCS1	#####	6	5	1.78632	0.872184	0	336.4435
CR 300	OCS1	#####	6	6	1.78798	0.838936	0	142.6513
CR 300	OCS1	#####	6	3	1.94958	0.808379	0	529.892
CR 300	OCS1	#####	6	2	1.7215	0.737729	0	168.2915
CR 300	OCS1	#####	6	7	1.82002	0.595598	0	411.2988
CR 700	CS2	#####	1	1	1.56848	4.016628	1	142.7078
CR 700	CS2	#####	1	3	1.2776	2.479649	1	538.5952
CR 700	CS2	#####	1	4	1.67686	1.179586	1	586.7658

CR 700	CS2	#####	1	6	1.70368	1.071798	1	114.5713
CR 700	CS2	#####	1	7	1.72914	0.985461	1	524.1527
CR 700	CS2	#####	1	2	1.68074	0.882944	1	382.9748
CR 700	CS2	#####	1	8	1.74018	0.760841	1	667.0738
CR 700	CS2	#####	1	5	1.67	0.65509	1	660.3769
PWP	CS3	#####	2	4	1.30564	2.44631	1	40.63166
PWP	CS3	#####	2	2	1.55036	1.631879	1	37.60294
PWP	CS3	#####	2	8	1.47558	1.002995	1	77.60161
PWP	CS3	#####	2	5	1.60354	0.9716	1	151.4257
PWP	CS3	#####	2	3	1.3491	0.965088	1	75.43788
PWP	CS3	#####	2	1	1.73436	0.961738	1	13.92688
PWP	CS3	#####	2	7	1.4723	0.926442	1	47.26132
PWP	CS3	#####	2	6	1.58106	0.829823	1	288.7662

Draft

	NO3_ugN.ξ	NH4_ugN.L	NH4_ugN.ξ	pH	T	pKa	NH3_ugN.L	NH3_ugN.gsed
	312	104.7095	100	8.408846	20.56707	9.384567	10.01402	0.009908
	394	233.7256	340	8.408846	20.56707	9.384567	22.35265	0.022122
	476	110.331	119	8.408846	20.56707	9.384567	10.55165	0.010463
	378	204.3761	295	8.408846	20.56707	9.384567	19.54577	0.019338
	401	56.74496	28	8.408846	20.56707	9.384567	5.426878	0.005502
	246	282.138	404	8.408846	20.56707	9.384567	26.98263	0.0268
	462	58.5035	29	8.408846	20.56707	9.384567	5.595058	0.005509
	354	85.47066	69	8.408846	20.56707	9.384567	8.174097	0.008315
	554	152.3052	202	8.408846	20.56707	9.384567	14.56591	0.014405
	452	117.6306	177	8.408846	20.56707	9.384567	11.24976	0.01315
	419	74.37918	44	8.408846	20.56707	9.384567	7.113349	0.006966
	209	1087.272	772	6.128571	20.1964	9.396311	0.58663	0.000585
BD		2073.983	869	6.128571	20.1964	9.396311	1.119003	0.00111
BD		1386.539	810	6.128571	20.1964	9.396311	0.748097	0.000752
	351	699.7794	666	6.128571	20.1964	9.396311	0.377561	0.00038
	123	691.3208	659	6.128571	20.1964	9.396311	0.372997	0.00037
	113	349.067	467	6.128571	20.1964	9.396311	0.188337	0.000186
BD		1089.921	775	6.128571	20.1964	9.396311	0.588059	0.000589
	483	347.274	470	6.128571	20.1964	9.396311	0.187369	0.000188
	51	830.7508	710	6.128571	20.1964	9.396311	0.448226	0.000449
	72	160.2911	246	7.305567	19.13895	9.429979	1.194673	0.001265
	286	242.7111	360	7.305567	19.13895	9.429979	1.808961	0.001819
	240	582.5507	622	7.305567	19.13895	9.429979	4.341835	0.004513
	261	130.898	166	7.305567	19.13895	9.429979	0.975602	0.00098
	327	196.4938	285	7.305567	19.13895	9.429979	1.464497	0.001444
	236	281.5996	406	7.305567	19.13895	9.429979	2.098803	0.002114
	254	200.9784	294	7.305567	19.13895	9.429979	1.497921	0.001506
	248	126.1186	151	7.305567	19.13895	9.429979	0.939981	0.000942
	319	171.3215	251	7.305567	19.13895	9.429979	1.276884	0.00128
	263	245.0527	361	7.305567	19.13895	9.429979	1.826413	0.001824
	250	62.27547	32	8.016486	19.33678	9.423662	2.346713	0.002317
	259	183.0673	264	8.016486	19.33678	9.423662	6.898486	0.006858
	308	85.77216	61	8.016486	19.33678	9.423662	3.232133	0.003193
	289	193.7762	278	8.016486	19.33678	9.423662	7.302026	0.00713
	537	79.93924	53	8.016486	19.33678	9.423662	3.012333	0.002985
	556	257.3197	375	8.016486	19.33678	9.423662	9.696522	0.009637
	426	107.575	108	8.016486	19.33678	9.423662	4.053725	0.004001
	181	174.6052	250	8.016486	19.33678	9.423662	6.579609	0.006454
	275	155.0446	205	8.016486	19.33678	9.423662	5.842512	0.005774
	293	119.3759	134	8.016486	19.33678	9.423662	4.498417	0.004425
BD		362.3034	482	7.35275	20.1964	9.396311	3.247881	0.003263
	253	239.5411	356	7.35275	20.1964	9.396311	2.147375	0.002146
	210	503.5672	568	7.35275	20.1964	9.396311	4.514245	0.004405
	304	266.7145	388	7.35275	20.1964	9.396311	2.390972	0.002381
BD		110.2102	118	7.35275	20.1964	9.396311	0.987983	0.000976
	283	514.9173	583	7.35275	20.1964	9.396311	4.615994	0.004569

93	364.4124	483	7.35275	20.1964	9.396311	3.266788	0.003268
360	319.1064	441	7.35275	20.1964	9.396311	2.86064	0.002851
79	222.8213	324	7.35275	20.1964	9.396311	1.997489	0.001952
266	244.6626	358	7.35275	20.1964	9.396311	2.193286	0.00217
224	346.1609	466	7.429508	20.45205	9.388208	3.765552	0.003737
321	143.6903	186	7.429508	20.45205	9.388208	1.563069	0.001548
551	127.7768	157	7.429508	20.45205	9.388208	1.389962	0.001385
553	82.05577	56	7.429508	20.45205	9.388208	0.892606	0.00088
387	193.8518	282	7.429508	20.45205	9.388208	2.108727	0.002085
567	152.628	203	7.429508	20.45205	9.388208	1.660294	0.001644
512	245.8932	223	7.429508	20.45205	9.388208	2.674836	0.001762
331	158.4421	212	7.429508	20.45205	9.388208	1.723539	0.001713
602	112.7253	885	7.429508	20.45205	9.388208	1.22623	0.028573
503	140.7452	181	7.429508	20.45205	9.388208	1.531032	0.00152
489	43.13169	11	8.553077	27.392	9.173503	8.338197	0.00819
365	98.24714	83	8.553077	27.392	9.173503	18.99309	0.017959
461	132.3075	164	8.553077	27.392	9.173503	25.57762	0.025206
465	57.62374	30	8.553077	27.392	9.173503	11.13979	0.011213
498	31.44222	5	8.553077	27.392	9.173503	6.078394	0.006086
182	155.5417	204	8.553077	27.392	9.173503	30.06925	0.029539
388	120.9612	135	8.553077	27.392	9.173503	23.38417	0.022917
437	128.8916	152	8.553077	27.392	9.173503	24.91725	0.024468
506	89.45729	74	8.553077	27.392	9.173503	17.29384	0.017227
514	90.06148	76	8.553077	27.392	9.173503	17.41064	0.017516
42	1075.6	769	6.262222	24.97081	9.247273	1.112118	0.001097
BD	1503.25	822	6.262222	24.97081	9.247273	1.554287	0.00153
BD	1477.05	821	6.262222	24.97081	9.247273	1.527198	0.001529
BD	478.4938	558	6.262222	24.97081	9.247273	0.494739	0.000487
BD	764.4553	688	6.262222	24.97081	9.247273	0.790409	0.000792
BD	621.6775	627	6.262222	24.97081	9.247273	0.642784	0.000634
BD	398.1135	505	6.262222	24.97081	9.247273	0.41163	0.000404
BD	933.6273	736	6.262222	24.97081	9.247273	0.965325	0.000969
24	476.7374	562	6.262222	24.97081	9.247273	0.492923	0.00049
67	513.4052	586	7.413191	25.20233	9.240167	7.534662	0.007546
142	120.4582	140	7.413191	25.20233	9.240167	1.767827	0.001764
101	203.6142	296	7.413191	25.20233	9.240167	2.988213	0.002988
169	344.0353	462	7.413191	25.20233	9.240167	5.049012	0.004991
239	57.82069	27	7.413191	25.20233	9.240167	0.848568	0.00084
280	211.456	312	7.413191	25.20233	9.240167	3.103299	0.003109
104	293.0501	419	7.413191	25.20233	9.240167	4.300762	0.004301
163	277.8511	394	7.413191	25.20233	9.240167	4.077703	0.004012
303	229.7834	336	7.413191	25.20233	9.240167	3.372269	0.003319
176	109.0493	112	7.413191	25.20233	9.240167	1.600392	0.001577
375	65.42612	35	7.948919	24.61471	9.258224	3.059477	0.002977
168	87.0026	65	7.948919	24.61471	9.258224	4.068443	0.003996
524	58.23396	26	7.948919	24.61471	9.258224	2.723155	0.002675
220	123.7774	147	7.948919	24.61471	9.258224	5.788118	0.005793

	124	77.13834	49	7.948919	24.61471	9.258224	3.607167	0.003554
	501	101.7762	92	7.948919	24.61471	9.258224	4.759292	0.004703
	175	213.2939	314	7.948919	24.61471	9.258224	9.974116	0.009928
	235	104.1753	96	7.948919	24.61471	9.258224	4.871478	0.004798
BD		122.1241	146	7.948919	24.61471	9.258224	5.710805	0.005709
	396	34.55671	7	7.948919	24.61471	9.258224	1.615952	0.001618
	409	88.64327	73	7.484238	24.99672	9.246477	1.506475	0.001504
	292	147.7176	192	7.484238	24.99672	9.246477	2.510431	0.002469
	212	225.8671	328	7.484238	24.99672	9.246477	3.838567	0.003749
	358	151.095	201	7.484238	24.99672	9.246477	2.56783	0.002556
	340	189.829	277	7.484238	24.99672	9.246477	3.226107	0.003209
	233	292.8267	413	7.484238	24.99672	9.246477	4.976531	0.004914
	404	98.13591	94	7.484238	24.99672	9.246477	1.667801	0.001725
	237	257.0525	377	7.484238	24.99672	9.246477	4.368557	0.004357
	274	82.72775	58	7.484238	24.99672	9.246477	1.405942	0.001405
	306	201.9482	291	7.484238	24.99672	9.246477	3.432071	0.003373
	185	142.338	188	7.626861	26.8112	9.191091	3.779241	0.003804
	439	69.90068	41	7.626861	26.8112	9.191091	1.855945	0.001863
	405	157.4251	214	7.626861	26.8112	9.191091	4.179822	0.004188
	315	330.5019	456	7.626861	26.8112	9.191091	8.775213	0.008772
	122	546.37	604	7.626861	26.8112	9.191091	14.50677	0.014507
	429	126.4293	153	7.626861	26.8112	9.191091	3.356846	0.003365
	372	66.20727	38	7.626861	26.8112	9.191091	1.757881	0.001761
	415	134.5265	168	7.626861	26.8112	9.191091	3.571836	0.00357
	371	156.5454	211	7.626861	26.8112	9.191091	4.156463	0.004155
	458	149.5706	200	7.626861	26.8112	9.191091	3.971275	0.003976
	412	112.0096	99	7.639615	23.59223	9.289814	2.451575	0.00226
	444	84.42404	50	7.639615	23.59223	9.289814	1.847805	0.001703
	469	88.17559	57	7.639615	23.59223	9.289814	1.929916	0.001779
	486	172.8282	217	7.639615	23.59223	9.289814	3.782724	0.003486
	495	86.6234	54	7.639615	23.59223	9.289814	1.895943	0.001747
	496	94.20234	67	7.639615	23.59223	9.289814	2.061825	0.0019
	519	275.0312	370	7.639615	23.59223	9.289814	6.019661	0.005548
BD		236.0231	323	7.639615	23.59223	9.289814	5.165884	0.004761
	27	402.0677	489	7.531905	21.50871	9.354864	5.954693	0.005488
	147	775.0569	669	7.531905	21.50871	9.354864	11.47873	0.01058
BD		690.0206	643	7.531905	21.50871	9.354864	10.21933	0.009419
BD		880.9402	703	7.531905	21.50871	9.354864	13.04688	0.012025
BD		300.159	399	7.531905	21.50871	9.354864	4.445407	0.004097
BD		994.9038	733	7.531905	21.50871	9.354864	14.7347	0.013581
BD		3040.75	888	7.531905	21.50871	9.354864	45.03405	0.041508
BD		460.8382	530	7.531905	21.50871	9.354864	6.825095	0.006291
BD		329.596	427	7.531905	21.50871	9.354864	4.881375	0.004499
BD		684.1341	639	7.531905	21.50871	9.354864	10.13215	0.009338
	61	337.9209	434	7.197943	20.17	9.397148	2.122625	0.001957
	81	332.3371	430	7.197943	20.17	9.397148	2.08755	0.001924
	152	154.1943	185	7.197943	20.17	9.397148	0.96856	0.000893

	241	131.2552	148	7.197943	20.17	9.397148	0.82447	0.000781
	251	129.6803	139	7.197943	20.17	9.397148	0.814577	0.000751
	269	80.0051	45	7.197943	20.17	9.397148	0.502546	0.000463
	279	111.3953	97	7.197943	20.17	9.397148	0.699721	0.000645
	287	74.489	39	7.197943	20.17	9.397148	0.467897	0.000431
	299	117.0934	114	7.197943	20.17	9.397148	0.735513	0.000678
	309	106.6907	91	7.197943	20.17	9.397148	0.670169	0.000618
	151	244.7881	333	8.070541	21	9.370887	11.67406	0.010759
	186	122.8825	129	8.070541	21	9.370887	5.860324	0.005401
	189	147.9704	171	8.070541	21	9.370887	7.056776	0.006504
	196	148.1574	172	8.070541	21	9.370887	7.065697	0.006512
	231	99.78922	81	8.070541	21	9.370887	4.758994	0.004386
	291	65.63342	31	8.070541	21	9.370887	3.130088	0.002885
	353	176.4003	224	8.070541	21	9.370887	8.412611	0.007754
	380	116.7875	113	8.070541	21	9.370887	5.56965	0.005133
BD		437.545	518	8.070541	21	9.370887	20.86672	0.019232
BD		971.2561	725	8.070541	21	9.370887	46.31965	0.042692
	184	279.4429	378	7.931298	22.36345	9.328068	10.77568	0.009932
	214	210.1162	284	7.931298	22.36345	9.328068	8.102354	0.007468
	318	199.1649	267	7.931298	22.36345	9.328068	7.680058	0.007079
	339	310.4368	410	7.931298	22.36345	9.328068	11.97085	0.011033
	349	189.9124	255	7.931298	22.36345	9.328068	7.32327	0.00675
	398	214.5579	289	7.931298	22.36345	9.328068	8.273631	0.007626
	420	199.984	271	7.931298	22.36345	9.328068	7.711642	0.007108
	438	251.7737	341	7.931298	22.36345	9.328068	9.708721	0.008948
	440	177.4822	226	7.931298	22.36345	9.328068	6.843946	0.006308
	454	58.00897	22	7.931298	22.36345	9.328068	2.236901	0.002062
	73	785.5473	673	8.158196	22.75	9.316	51.07094	0.047071
	140	434.4504	515	8.158196	22.75	9.316	28.24501	0.026033
	276	199.5138	270	8.158196	22.75	9.316	12.97103	0.011966
	376	148.4178	174	8.158196	22.75	9.316	9.649118	0.008893
	464	42.17358	10	8.158196	22.75	9.316	2.741839	0.002528
	508	168.7859	209	8.158196	22.75	9.316	10.97331	0.010114
	540	137.9064	155	8.158196	22.75	9.316	8.965736	0.008263
	547	182.2399	239	8.158196	22.75	9.316	11.848	0.01092
	557	197.5571	265	8.158196	22.75	9.316	12.84382	0.011838
	582	270.39	366	8.158196	22.75	9.316	17.57891	0.016202
NA	NA	NA	NA	NA	NA	NA	NA	NA
	161	34.90085	8	7.303077	24.10515	9.27394	0.369278	0.000369
	252	69.8048	40	7.303077	24.10515	9.27394	0.738588	0.000738
	156	583.3239	605	7.303077	24.10515	9.27394	6.172013	0.00579
BD		401.8864	517	7.303077	24.10515	9.27394	4.252265	0.004255
	213	30.66675	4	7.303077	24.10515	9.27394	0.324478	0.00032
	20	67.09565	37	7.303077	24.10515	9.27394	0.709923	0.000695
	99	259.8605	383	7.303077	24.10515	9.27394	2.749522	0.002753
	336	22.20375	2	7.303077	24.10515	9.27394	0.234933	0.000232
BD		116.7493	131	7.303077	24.10515	9.27394	1.235296	0.001215

BD	1037.9	762	7.732381	21.1461	9.36628	23.5658	0.02356
BD	1762.55	851	7.732381	21.1461	9.36628	40.01918	0.040026
BD	1644.7	842	7.732381	21.1461	9.36628	37.34336	0.037369
BD	974.0297	746	7.732381	21.1461	9.36628	22.11561	0.022094
BD	394.6598	512	7.732381	21.1461	9.36628	8.960857	0.008973
BD	317.5444	437	7.732381	21.1461	9.36628	7.209931	0.007119
BD	840.8958	714	7.732381	21.1461	9.36628	19.09277	0.019113
BD	656.6413	654	7.732381	21.1461	9.36628	14.90922	0.014844
BD	1614.7	835	7.732381	21.1461	9.36628	36.6622	0.036697
BD	417.3211	528	7.732381	21.1461	9.36628	9.475388	0.009467
BD	132.756	167	7.994362	21.75	9.347284	5.639982	0.005636
BD	518.6102	587	7.994362	21.75	9.347284	22.03255	0.022019
BD	91.64165	75	7.994362	21.75	9.347284	3.893289	0.003842
BD	370.016	488	7.994362	21.75	9.347284	15.7197	0.015717
28	191.5288	279	7.994362	21.75	9.347284	8.136876	0.008067
BD	94.51655	87	7.994362	21.75	9.347284	4.015426	0.004019
BD	199.9497	286	7.994362	21.75	9.347284	8.494628	0.008238
BD	215.9757	299	7.994362	21.75	9.347284	9.175474	0.008702
BD	164.7605	51	7.994362	21.75	9.347284	6.999658	0.003349
BD	233.5398	330	7.994362	21.75	9.347284	9.921666	0.009491
BD	405.0961	520	7.6	19.62	9.414633	6.113935	0.006089
BD	301.4232	424	7.6	19.62	9.414633	4.549246	0.004494
BD	187.9805	272	7.6	19.62	9.414633	2.837106	0.002801
6	347.3688	469	7.6	19.62	9.414633	5.242683	0.005237
BD	222.3451	325	7.6	19.62	9.414633	3.355755	0.003293
15	112.623	122	7.6	19.62	9.414633	1.699768	0.001677
BD	86.38645	59	7.6	19.62	9.414633	1.303792	0.001252
BD	109.1205	104	7.6	19.62	9.414633	1.646907	0.001592
BD	193.7594	349	7.6	19.62	9.414633	2.924324	0.003544
70	107.1476	95	7.6	19.62	9.414633	1.617131	0.001547
193	213.6026	307	7.918149	22.98507	9.308676	8.351382	0.008184
247	105.2849	103	7.918149	22.98507	9.308676	4.116404	0.004113
217	323.8694	450	7.918149	22.98507	9.308676	12.66257	0.01267
106	188.652	276	7.918149	22.98507	9.308676	7.375869	0.007378
4	409.568	524	7.918149	22.98507	9.308676	16.01319	0.016014
90	239.3257	355	7.918149	22.98507	9.308676	9.3571	0.009355
118	57.21105	24	7.918149	22.98507	9.308676	2.236824	0.002191
BD	258.4904	373	7.918149	22.98507	9.308676	10.10639	0.009936
200	121.7858	145	7.918149	22.98507	9.308676	4.761551	0.004764
19	114.3828	126	7.918149	22.98507	9.308676	4.472112	0.004392
BD	1315.95	802	8.127834	23.74866	9.284967	85.6777	0.084408
BD	890.9501	722	8.127834	23.74866	9.284967	58.00718	0.05751
125	500.7541	569	8.127834	23.74866	9.284967	32.60265	0.032043
BD	106.741	111	8.127834	23.74866	9.284967	6.949598	0.006943
192	119.6784	136	8.127834	23.74866	9.284967	7.791915	0.007726
BD	633.1954	635	8.127834	23.74866	9.284967	41.22552	0.040625
173	283.717	402	8.127834	23.74866	9.284967	18.47199	0.018144

	170	391.794	506	8.127834	23.74866	9.284967	25.50857	0.025449
	258	94.0784	85	8.127834	23.74866	9.284967	6.125173	0.006122
	329	106.2986	110	8.127834	23.74866	9.284967	6.920791	0.006921
BD		1055.073	767	7.92	24.15	9.272555	44.8599	0.044568
BD		984.3687	744	7.92	24.15	9.272555	41.85367	0.040946
	171	623.1391	633	7.92	24.15	9.272555	26.49481	0.026459
	22	871.7476	720	7.92	24.15	9.272555	37.06522	0.037066
	78	433.5182	535	7.92	24.15	9.272555	18.43245	0.018416
BD		853.0013	717	7.92	24.15	9.272555	36.26816	0.036036
	66	312.7313	433	7.92	24.15	9.272555	13.2968	0.013177
	64	640.3007	645	7.92	24.15	9.272555	27.22449	0.027136
	434	108.1026	115	7.92	24.15	9.272555	4.596339	0.004591
	139	769.1023	687	7.92	24.15	9.272555	32.70091	0.032523
BD		2032.387	866	7.39	25.68	9.225541	29.25289	0.029109
BD		2164.033	875	7.39	25.68	9.225541	31.14772	0.031077
BD		1885.238	855	7.39	25.68	9.225541	27.13493	0.027044
BD		1507.807	826	7.39	25.68	9.225541	21.70242	0.021613
BD		901.3046	728	7.39	25.68	9.225541	12.97281	0.012947
BD		911.807	777	7.39	25.68	9.225541	13.12397	0.015854
NA	NA	NA	NA	NA	NA	NA	NA	NA
BD		1106.979	778	7.39	25.68	9.225541	15.93315	0.015878
BD		1155.952	781	7.39	25.68	9.225541	16.63804	0.016566
	88	687.9124	658	7.39	25.68	9.225541	9.901375	0.009831
	516	139.0764	179	7.75	23.54	9.291434	3.886081	0.003859
	555	64.87566	36	7.75	23.54	9.291434	1.812759	0.001802
	179	160.2611	221	7.75	23.54	9.291434	4.478025	0.004476
	597	150.2646	198	7.75	23.54	9.291434	4.1987	0.004169
	560	53.12834	21	7.75	23.54	9.291434	1.484515	0.001482
	590	108.2647	116	7.75	23.54	9.291434	3.025137	0.003023
	301	543.0578	601	7.75	23.54	9.291434	15.17415	0.015152
	581	56.91238	25	7.75	23.54	9.291434	1.590249	0.001588
	576	112.1218	124	7.75	23.54	9.291434	3.132914	0.003116
	272	22.34819	3	7.75	23.54	9.291434	0.624454	0.000623
	249	198.6667	288	7.7	22.5	9.323801	4.614428	0.004592
	539	50.84409	19	7.7	22.5	9.323801	1.180955	0.001179
	100	613.3856	626	7.7	22.5	9.323801	14.2471	0.014151
	559	140.2996	182	7.7	22.5	9.323801	3.258736	0.003257
	137	168.8192	237	7.7	22.5	9.323801	3.921161	0.003897
	342	296.7079	422	7.7	22.5	9.323801	6.891629	0.006886
	379	180.116	260	7.7	22.5	9.323801	4.183551	0.004159
	497	290.5507	416	7.7	22.5	9.323801	6.748616	0.006738
	370	393.0972	508	7.7	22.5	9.323801	9.130462	0.009131
	382	460.2654	550	7.7	22.5	9.323801	10.69058	0.010633
	203	44.6513	13	7.69	22.02	9.338816	0.980339	0.00098
	188	192.0056	283	7.69	22.02	9.338816	4.215568	0.004228
	441	<10	899	7.69	22.02	9.338816	NA	NA
	570	92.47446	82	7.69	22.02	9.338816	2.030318	0.002026

	366	382.6362	499	7.69	22.02	9.338816	8.400949	0.008364
	385	171.3445	248	7.69	22.02	9.338816	3.761945	0.003756
	433	267.7042	389	7.69	22.02	9.338816	5.877564	0.005836
	479	233.2605	342	7.69	22.02	9.338816	5.121338	0.005106
	45	881.8311	721	7.69	22.02	9.338816	19.361	0.019301
	468	103.5144	101	7.69	22.02	9.338816	2.272704	0.002286
BD		655.1345	653	7.98	23.05	9.306655	29.48984	0.029393
BD		996.8561	752	7.98	23.05	9.306655	44.87189	0.044667
BD		997.1268	750	7.98	23.05	9.306655	44.88408	0.044282
	416	137.3613	173	7.98	23.05	9.306655	6.183099	0.006147
	485	142.8881	184	7.98	23.05	9.306655	6.431883	0.00639
	532	221.0567	293	7.98	23.05	9.306655	9.950517	0.009015
	446	613.763	628	7.98	23.05	9.306655	27.62757	0.027658
	481	79.15622	52	7.98	23.05	9.306655	3.563091	0.003558
	534	388.5089	502	7.98	23.05	9.306655	17.48811	0.017417
	390	546.8596	602	7.98	23.05	9.306655	24.61602	0.024508
BD		1097.8	774	7.69	18.05	9.464905	18.12951	0.017987
BD		968.5651	743	7.69	18.05	9.464905	15.99527	0.015863
BD		959.9746	755	7.69	18.05	9.464905	15.8534	0.016495
	75	386.934	507	7.69	18.05	9.464905	6.389981	0.006471
BD		643.8027	651	7.69	18.05	9.464905	10.63201	0.010751
BD		707.1371	675	7.69	18.05	9.464905	11.67794	0.011969
BD		995.2253	758	7.69	18.05	9.464905	16.43555	0.016774
	143	235.3643	352	7.69	18.05	9.464905	3.886899	0.003933
BD		313.669	447	7.69	18.05	9.464905	5.180055	0.005321
	202	589.3278	624	7.69	18.05	9.464905	9.732394	0.01003
BD		2984.75	892	7.64	19.12	9.430584	47.5714	0.049653
BD		1215.65	786	7.64	19.12	9.430584	19.37521	0.01936
BD		3506.3	895	7.64	19.12	9.430584	55.88394	0.056017
BD		1239.9	801	7.64	19.12	9.430584	19.76172	0.020634
BD		1641.3	841	7.64	19.12	9.430584	26.15929	0.026067
BD		2352.5	879	7.64	19.12	9.430584	37.4945	0.038196
BD		2475.6	881	7.64	19.12	9.430584	39.45649	0.040412
BD		1971.3	864	7.64	19.12	9.430584	31.41888	0.031917
BD		781.297	692	7.64	19.12	9.430584	12.45243	0.012522
BD		563.9116	612	7.64	19.12	9.430584	8.987709	0.009139
	316	208.4248	303	7.88	20.55	9.385107	6.316512	0.006275
	47	488.8494	579	7.88	20.55	9.385107	14.81505	0.015286
	131	128.3705	150	7.88	20.55	9.385107	3.89039	0.00383
NA	NA	NA	NA	NA	NA	NA	NA	NA
	120	210.1052	306	7.88	20.55	9.385107	6.367438	0.006343
	337	254.9113	380	7.88	20.55	9.385107	7.72533	0.007857
	205	136.1589	169	7.88	20.55	9.385107	4.126425	0.00409
	41	168.5762	207	7.88	20.55	9.385107	5.108861	0.004699
	282	117.1637	143	7.88	20.55	9.385107	3.550757	0.00365
	352	112.3345	130	7.88	20.55	9.385107	3.404402	0.003461
	256	241.8141	362	7.75	19.54	9.417181	5.093942	0.005204

	384	330.1847	457	7.75	19.54	9.417181	6.955515	0.006974
	107	20.0064	1	7.75	19.54	9.417181	0.421445	0.000428
BD		254.1587	379	7.75	19.54	9.417181	5.353987	0.005454
	52	231.7779	344	7.75	19.54	9.417181	4.882523	0.004907
	126	144.209	199	7.75	19.54	9.417181	3.037838	0.003154
BD		401.7123	516	7.75	19.54	9.417181	8.462281	0.008453
	172	107.0837	128	7.75	19.54	9.417181	2.255774	0.002381
	31	71.87155	46	7.75	19.54	9.417181	1.514012	0.001563
	74	87.1597	72	7.75	19.54	9.417181	1.836065	0.001862
BD		1243.55	788	7.69	17.99	9.466837	20.44682	0.020195
BD		1818.45	854	7.69	17.99	9.466837	29.8995	0.030668
BD		2013.9	870	7.69	17.99	9.466837	33.11315	0.033949
BD		3306.95	893	7.69	17.99	9.466837	54.37386	0.056311
BD		762.8675	700	7.69	17.99	9.466837	12.5433	0.0132
BD		1953.05	859	7.69	17.99	9.466837	32.11263	0.032097
BD		1026.95	760	7.69	17.99	9.466837	16.88542	0.016882
	453	377.2598	490	7.69	17.99	9.466837	6.203018	0.006113
	136	975.5158	747	7.69	17.99	9.466837	16.03972	0.016027
	89	297.2914	426	7.69	17.99	9.466837	4.888154	0.00496
BD		1374.55	811	7.83	20.25	9.394611	36.46473	0.037321
BD		1323.45	806	7.83	20.25	9.394611	35.10912	0.035384
BD		790.146	698	7.83	20.25	9.394611	20.96138	0.021256
BD		839.0086	719	7.83	20.25	9.394611	22.25763	0.022923
BD		986.7726	759	7.83	20.25	9.394611	26.17758	0.027068
BD		988.1531	754	7.83	20.25	9.394611	26.2142	0.026365
BD		1941.05	861	7.83	20.25	9.394611	51.49311	0.052607
BD		1064.85	776	7.83	20.25	9.394611	28.24886	0.029003
BD		1336.5	809	7.83	20.25	9.394611	35.45532	0.036564
BD		1289.8	803	7.83	20.25	9.394611	34.21644	0.034422
BD		1440.1	827	7.88	21.35	9.359857	46.17244	0.048157
BD		1270.35	804	7.88	21.35	9.359857	40.72992	0.042067
BD		427.3332	537	7.88	21.35	9.359857	13.70114	0.013965
BD		1482.65	818	7.88	21.35	9.359857	47.53667	0.047095
BD		904.9951	731	7.88	21.35	9.359857	29.01592	0.029156
BD		946.1149	741	7.88	21.35	9.359857	30.3343	0.030546
BD		1104.65	779	7.88	21.35	9.359857	35.41725	0.035998
BD		809.4405	699	7.88	21.35	9.359857	25.95225	0.025691
BD		546.7827	610	7.88	21.35	9.359857	17.53093	0.017721
BD		1625.75	834	7.88	21.35	9.359857	52.12474	0.051398
	492	547.3038	609	7.79	19.07	9.432183	12.19713	0.012269
BD		477.2793	571	7.79	19.07	9.432183	10.63658	0.011041
	69	824.456	707	7.79	19.07	9.432183	18.37371	0.018255
	431	786.5934	693	7.79	19.07	9.432183	17.52991	0.01762
	127	194.525	287	7.79	19.07	9.432183	4.335156	0.004324
	244	130.0094	162	7.79	19.07	9.432183	2.897371	0.002888
	260	184.835	273	7.79	19.07	9.432183	4.119206	0.004158
	332	320.9502	452	7.79	19.07	9.432183	7.15265	0.007292

	222	158.0179	222	7.79	19.07	9.432183	3.521563	0.003586
	30	224.462	327	7.79	19.07	9.432183	5.002328	0.004915
	208	294.2436	423	7.73	19.04	9.433142	5.715398	0.005761
BD		527.7164	600	7.73	19.04	9.433142	10.25038	0.010511
	135	360.8102	485	7.73	19.04	9.433142	7.00839	0.007111
	115	373.2496	491	7.73	19.04	9.433142	7.250013	0.007244
BD		443.8467	543	7.73	19.04	9.433142	8.621293	0.008706
	46	307.0759	432	7.73	19.04	9.433142	5.964652	0.005998
	43	465.1751	545	7.73	19.04	9.433142	9.035577	0.008753
	40	127.2572	158	7.73	19.04	9.433142	2.471847	0.002484
BD		182.0046	266	7.73	19.04	9.433142	3.535263	0.003538
BD		193	292	7.73	19.04	9.433142	3.748838	0.00386
BD		2008.2	873	7.75	17.83	9.471993	37.38122	0.039045
BD		1251.25	797	7.75	17.83	9.471993	23.29113	0.023599
	49	365.9038	495	7.75	17.83	9.471993	6.81104	0.00702
BD		967.8243	751	7.75	17.83	9.471993	18.01537	0.018324
	29	217.0539	320	7.75	17.83	9.471993	4.040304	0.003998
BD		202.4076	302	7.75	17.83	9.471993	3.767673	0.003853
BD		634.6919	644	7.75	17.83	9.471993	11.81434	0.011848
BD		815.1658	713	7.75	17.83	9.471993	15.17373	0.015589
BD		361.236	480	7.75	17.83	9.471993	6.724153	0.006742
BD		787.3458	695	7.75	17.83	9.471993	14.65589	0.014806
	204	363.1216	500	7.76	16.18	9.525496	6.125858	0.006437
	174	375.8162	492	7.76	16.18	9.525496	6.340017	0.006294
	91	309.2392	445	7.76	16.18	9.525496	5.216863	0.005404
	96	370.1664	487	7.76	16.18	9.525496	6.244703	0.00623
	448	237.6646	347	7.76	16.18	9.525496	4.0094	0.003952
	413	261.4753	386	7.76	16.18	9.525496	4.411086	0.004415
	216	450.3778	547	7.76	16.18	9.525496	7.59787	0.007627
	218	223.1999	339	7.76	16.18	9.525496	3.76538	0.003895
	245	370.3491	503	7.76	16.18	9.525496	6.247786	0.006532
BD		255.5706	372	7.76	16.18	9.525496	4.311473	0.004287
BD		402.5807	526	8.31	14.55	9.578953	20.56497	0.021062
BD		294.7818	415	8.31	14.55	9.578953	15.0583	0.014818
BD		319.4212	454	8.31	14.55	9.578953	16.31695	0.016826
BD		48.5244	17	8.31	14.55	9.578953	2.478765	0.002538
BD		327.1915	465	8.31	14.55	9.578953	16.71388	0.017515
BD		584.0323	619	8.31	14.55	9.578953	29.83404	0.030705
BD		346.4643	473	8.31	14.55	9.578953	17.69839	0.01802
BD		120.8444	149	8.31	14.55	9.578953	6.173078	0.006367
BD		176.1851	258	8.31	14.55	9.578953	9.00004	0.009089
BD		184.0067	269	8.31	14.55	9.578953	9.399587	0.009402
BD		316.9533	443	8.11	11.79	9.670864	8.479203	0.008535
	162	126.0152	160	8.11	11.79	9.670864	3.371186	0.00344
BD		414.6783	527	8.11	11.79	9.670864	11.09356	0.011149
BD		324.0788	448	8.11	11.79	9.670864	8.669826	0.008664
BD		253.2622	371	8.11	11.79	9.670864	6.775325	0.006782

BD	239.4988	363	8.11	11.79	9.670864	6.407124	0.006618
	84 153.4391	210	8.11	11.79	9.670864	4.104835	0.004185
BD	161.2635	215	8.11	11.79	9.670864	4.314155	0.004236
	13 289.1318	414	8.11	11.79	9.670864	7.734917	0.007751
BD	168.8535	249	8.11	11.79	9.670864	4.517205	0.004577
BD	380.9362	514	8.18	15.73	9.540194	15.92615	0.016661
	83 216.6028	332	8.18	15.73	9.540194	9.055716	0.009431
	50 94.37035	86	8.18	15.73	9.540194	3.94543	0.003936
	410 106.9053	117	8.18	15.73	9.540194	4.46949	0.004545
	17 58.8266	33	8.18	15.73	9.540194	2.459419	0.002611
	97 226.2392	317	8.18	15.73	9.540194	9.458594	0.008961
BD	198.3959	297	8.18	15.73	9.540194	8.294523	0.008516
	8 170.5089	236	8.18	15.73	9.540194	7.128625	0.007011
	153 158.8101	220	8.18	15.73	9.540194	6.639522	0.006672
	26 93.33725	88	8.18	15.73	9.540194	3.902238	0.004
BD	903.1582	730	8.29	14.63	9.576315	44.41679	0.044519
	108 167.7712	229	8.29	14.63	9.576315	8.250889	0.008144
BD	239.9098	374	8.29	14.63	9.576315	11.79862	0.01251
BD	230.7915	353	8.29	14.63	9.576315	11.35019	0.01172
BD	252.5504	369	8.29	14.63	9.576315	12.42028	0.012448
BD	210.0178	321	8.29	14.63	9.576315	10.32855	0.01057
BD	86.6671	68	8.29	14.63	9.576315	4.262237	0.004271
BD	100.6411	107	8.29	14.63	9.576315	4.949468	0.005215
BD	309.4777	431	8.29	14.63	9.576315	15.21993	0.015174
BD	575.055	611	8.29	14.63	9.576315	28.28086	0.027934
BD	535.7897	595	8.22	14.04	9.595803	21.64138	0.021602
BD	516.2168	584	8.22	14.04	9.595803	20.8508	0.020656
NA	NA	NA	NA	NA	NA	NA	NA
BD	436.9589	538	8.22	14.04	9.595803	17.64945	0.017861
BD	504.0434	576	8.22	14.04	9.595803	20.3591	0.020198
BD	427.1793	536	8.22	14.04	9.595803	17.25444	0.017496
BD	353.8016	484	8.22	14.04	9.595803	14.2906	0.014778
BD	368.359	481	8.22	14.04	9.595803	14.87859	0.014675
BD	205.0245	315	8.22	14.04	9.595803	8.281259	0.008578
BD	523.0354	589	8.22	14.04	9.595803	21.12621	0.021128
	65 153.2292	206	8.15	11.56	9.678603	4.406224	0.004458
	103 189.4182	281	8.15	11.56	9.678603	5.446868	0.005487
	323 215.6254	329	8.15	11.56	9.678603	6.200475	0.00637
	5 186.8119	268	8.15	11.56	9.678603	5.37192	0.005289
	128 104.2522	106	8.15	11.56	9.678603	2.997853	0.003048
	146 109.7603	121	8.15	11.56	9.678603	3.156243	0.003179
	226 127.5726	154	8.15	11.56	9.678603	3.668448	0.003645
	3 95.42845	89	8.15	11.56	9.678603	2.744119	0.002757
	197 118.0068	137	8.15	11.56	9.678603	3.393376	0.003419
	145 118.7566	144	8.15	11.56	9.678603	3.414937	0.003485
BD	2974.25	880	7.66	23.22	9.301369	66.40526	0.055815
BD	2488.4	884	7.66	23.22	9.301369	55.55782	0.058339

BD	2917.2	890	7.66	23.22	9.301369	65.13152	0.066025
BD	2554.75	883	7.66	23.22	9.301369	57.0392	0.058148
BD	4887.25	898	7.66	23.22	9.301369	109.1163	0.111031
BD	1976.8	863	7.66	23.22	9.301369	44.13547	0.044639
BD	1594.7	836	7.66	23.22	9.301369	35.60443	0.036158
BD	1206.15	787	7.66	23.22	9.301369	26.92938	0.027302
BD	1551.35	829	7.66	23.22	9.301369	34.63657	0.03504
BD	1602.1	837	7.66	23.22	9.301369	35.76965	0.036213
BD	4767.5	897	7.73	23.67	9.287404	128.5338	0.133105
BD	1436.1	816	7.73	23.67	9.287404	38.71785	0.039058
BD	1564.6	832	7.73	23.67	9.287404	42.18227	0.042837
BD	2032.2	868	7.73	23.67	9.287404	54.78896	0.055089
BD	3723.8	896	7.73	23.67	9.287404	100.3952	0.101744
BD	2294.4	878	7.73	23.67	9.287404	61.85798	0.063148
BD	1917	860	7.73	23.67	9.287404	51.68312	0.052791
BD	1680.1	846	7.73	23.67	9.287404	45.2962	0.045593
BD	1213.7	789	7.73	23.67	9.287404	32.72186	0.033211
BD	1241.55	793	7.73	23.67	9.287404	33.47271	0.033923
232	327.1043	458	8.08	24.67	9.256522	20.42501	0.020691
92	342.6819	476	8.08	24.67	9.256522	21.39771	0.022262
290	531.6246	596	8.08	24.67	9.256522	33.19565	0.033622
62	574.8838	613	8.08	24.67	9.256522	35.89684	0.03628
35	158.9333	216	8.08	24.67	9.256522	9.924099	0.009932
102	147.5865	195	8.08	24.67	9.256522	9.215581	0.009296
295	126.0695	159	8.08	24.67	9.256522	7.872019	0.008006
154	447.4489	546	8.08	24.67	9.256522	27.93956	0.028183
273	343.1145	471	8.08	24.67	9.256522	21.42472	0.0218
BD	357.3238	486	8.08	24.67	9.256522	22.31198	0.022883
109	158.232	218	7.92	23.55	9.291124	6.457652	0.006502
44	272.3904	396	7.92	23.55	9.291124	11.1166	0.011181
BD	241.9673	365	7.92	23.55	9.291124	9.874998	0.010138
116	372.5166	493	7.92	23.55	9.291124	15.20288	0.015299
71	378.7552	498	7.92	23.55	9.291124	15.45749	0.015515
12	166.3538	240	7.92	23.55	9.291124	6.789113	0.006862
150	226.7501	337	7.92	23.55	9.291124	9.253965	0.009312
211	263.8597	390	7.92	23.55	9.291124	10.76845	0.011016
BD	715.2157	674	7.92	23.55	9.291124	29.18887	0.029557
10	163.0293	230	7.92	23.55	9.291124	6.653436	0.00676
BD	274.33	397	7.9	26.34	9.205409	12.93845	0.012968
268	145.0444	193	7.9	26.34	9.205409	6.840849	0.006915
201	37.74685	9	7.9	26.34	9.205409	1.780286	0.001778
421	91.3194	80	7.9	26.34	9.205409	4.306972	0.004326
343	74.38485	47	7.9	26.34	9.205409	3.508274	0.003532
56	93.0978	84	7.9	26.34	9.205409	4.390848	0.004432
190	61.5457	34	7.9	26.34	9.205409	2.902731	0.002966
BD	135.501	176	7.9	26.34	9.205409	6.390745	0.006479
80	110.1921	123	7.9	26.34	9.205409	5.197079	0.005245

BD	168.4903	245	7.9	26.34	9.205409	7.946647	0.008003
BD	1970.25	862	7.76	26.73	9.193555	70.02457	0.070659
	58 791.3985	705	7.76	26.73	9.193555	28.12706	0.029
BD	1140.7	770	7.76	26.73	9.193555	40.54157	0.037723
	297 794.3468	697	7.76	26.73	9.193555	28.23184	0.02835
	77 1423.45	813	7.76	26.73	9.193555	50.59077	0.050779
	194 1256.9	798	7.76	26.73	9.193555	44.67143	0.045116
	18 697.1508	667	7.76	26.73	9.193555	24.77741	0.025113
	36 804.1996	702	7.76	26.73	9.193555	28.58202	0.028718
BD	695.7108	665	7.76	26.73	9.193555	24.72623	0.024955
BD	1728.933	833	7.76	26.73	9.193555	61.44794	0.056777
	112 220.6703	331	7.8	25.1	9.243307	7.674745	0.00778
	23 722.6577	625	7.8	25.1	9.243307	25.13348	0.021125
	355 117.9969	142	7.8	25.1	9.243307	4.103842	0.004184
	294 44.86295	14	7.8	25.1	9.243307	1.560299	0.001578
	191 169.6917	253	7.8	25.1	9.243307	5.901748	0.006005
	138 223.3861	334	7.8	25.1	9.243307	7.769197	0.007858
	364 169.7143	252	7.8	25.1	9.243307	5.902534	0.005984
	456 134.097	170	7.8	25.1	9.243307	4.663792	0.004736
	198 80.7424	62	7.8	25.1	9.243307	2.808159	0.002949
	262 104.2065	105	7.8	25.1	9.243307	3.624221	0.003669
	129 166.6803	241	7.82	24.78	9.253138	5.929465	0.005986
	391 51.7299	20	7.82	24.78	9.253138	1.840233	0.001857
	285 312.4823	439	7.82	24.78	9.253138	11.11621	0.011281
	373 31.89015	6	7.82	24.78	9.253138	1.134456	0.001154
	270 167.0966	244	7.82	24.78	9.253138	5.944274	0.006028
	334 86.8955	70	7.82	24.78	9.253138	3.09121	0.00313
	95 41.31525	12	7.82	24.78	9.253138	1.469744	0.001561
	164 311.3643	438	7.82	24.78	9.253138	11.07644	0.011258
	356 227.9264	338	7.82	24.78	9.253138	8.108226	0.008176
	87 389.3109	513	7.82	24.78	9.253138	13.8493	0.014126
	450 207.4148	304	7.78	27.56	9.168428	8.147201	0.008178
	389 49.201	16	7.78	27.56	9.168428	1.932603	0.001929
	467 111.2355	125	7.78	27.56	9.168428	4.369303	0.004395
	403 168.8548	243	7.78	27.56	9.168428	6.632576	0.006646
	361 172.1491	254	7.78	27.56	9.168428	6.761975	0.006819
	359 212.8313	318	7.78	27.56	9.168428	8.359962	0.008425
	493 208.2528	305	7.78	27.56	9.168428	8.180117	0.008216
	313 165.8083	234	7.78	27.56	9.168428	6.51291	0.006574
	455 231.4656	345	7.78	27.56	9.168428	9.091911	0.009178
	457 354.3511	474	7.78	27.56	9.168428	13.91882	0.013899
	206 199.3458	300	7.9	26.92	9.187791	9.77209	0.010058
	265 97.04275	93	7.9	26.92	9.187791	4.757114	0.00494
	271 733.5206	681	7.9	26.92	9.187791	35.95777	0.0361
	85 631.6885	647	7.9	26.92	9.187791	30.96588	0.031342
	159 90.7653	78	7.9	26.92	9.187791	4.449388	0.004478
	187 208.7225	311	7.9	26.92	9.187791	10.23174	0.01037

NA	NA	NA	NA	NA	NA	NA	NA	NA
	278	391.2986	510	7.9	26.92	9.187791	19.18177	0.019312
	277	162.6164	227	7.9	26.92	9.187791	7.971585	0.008022
	326	86.7421	71	7.9	26.92	9.187791	4.252168	0.004314
	130	284.1269	412	7.9	26.92	9.187791	13.92813	0.014135
	180	228.8883	310	7.9	26.92	9.187791	11.22029	0.010347
BD		1775.85	850	7.75	25.52	9.230435	56.86397	0.056366
BD		759.6816	664	7.75	25.52	9.230435	24.32554	0.022428
BD		590.3435	608	7.75	25.52	9.230435	18.90322	0.017592
BD		452.8921	541	7.75	25.52	9.230435	14.50192	0.014232
BD		878.2276	706	7.75	25.52	9.230435	28.12147	0.026132
BD		1359.3	792	7.75	25.52	9.230435	43.52575	0.040192
BD		1786.65	843	7.75	25.52	9.230435	57.2098	0.053075
BD		836.9431	691	7.75	25.52	9.230435	26.79951	0.024758
BD		1281.35	783	7.75	25.52	9.230435	41.02973	0.037916
	25	438.518	523	7.75	25.52	9.230435	14.04166	0.013043
	33	493.771	557	7.9	25.13	9.242386	21.47004	0.020244
BD		858.3568	701	7.9	25.13	9.242386	37.32288	0.034954
	76	189.214	257	7.9	25.13	9.242386	8.227361	0.007665
BD		566.3675	590	7.9	25.13	9.242386	24.62666	0.022779
	57	679.7988	640	7.9	25.13	9.242386	29.55886	0.027473
BD		569.2359	591	7.9	25.13	9.242386	24.75139	0.022904
	54	442.5232	525	7.9	25.13	9.242386	19.24169	0.017864
	223	86.31635	55	7.9	25.13	9.242386	3.753188	0.003491
	9	341.3223	449	7.9	25.13	9.242386	14.8413	0.01409
	215	50.10875	15	7.9	25.13	9.242386	2.178817	0.002021
	132	232.4859	319	7.87	23.14	9.303856	8.257248	0.007618
BD		121.1283	127	7.87	23.14	9.303856	4.302138	0.003994
BD		203.8646	280	7.87	23.14	9.303856	7.240699	0.006748
	98	266.7764	364	7.87	23.14	9.303856	9.47515	0.008819
	302	129.4441	141	7.87	23.14	9.303856	4.597492	0.004272
	471	146.9291	175	7.87	23.14	9.303856	5.218508	0.004877
	341	82.172	48	7.87	23.14	9.303856	2.918519	0.00269
	435	202.3909	274	7.87	23.14	9.303856	7.188356	0.006645
	393	189.9973	256	7.87	23.14	9.303856	6.74817	0.006227
NA	NA	NA	NA	NA	NA	NA	NA	NA
	474	184.9755	263	7.95	26.7	9.194465	9.967634	0.009794
	422	128.356	156	7.95	26.7	9.194465	6.916622	0.006859
	344	117.3889	132	7.95	26.7	9.194465	6.325646	0.006209
	369	184.4581	261	7.95	26.7	9.194465	9.939753	0.009711
	504	103.5865	98	7.95	26.7	9.194465	5.581887	0.005556
	157	106.3982	102	7.95	26.7	9.194465	5.733399	0.005638
	264	147.3755	191	7.95	26.7	9.194465	7.941509	0.007824
	527	293.3686	411	7.95	26.7	9.194465	15.80853	0.01547
	414	145.7693	183	7.95	26.7	9.194465	7.85496	0.007633
	300	140.1249	178	7.95	26.7	9.194465	7.550801	0.007412
BD		1706.5	844	7.9	24.95	9.247912	73.30373	0.071558

BD	360.8459	475	7.9	24.95	9.247912	15.50035	0.015224
BD	290.9465	409	7.9	24.95	9.247912	12.49778	0.012261
BD	488.066	564	7.9	24.95	9.247912	20.96517	0.020416
117	92.0911	79	7.9	24.95	9.247912	3.955828	0.00394
BD	1373.85	807	7.9	24.95	9.247912	59.01455	0.057648
BD	604.6629	617	7.9	24.95	9.247912	25.97366	0.025467
BD	518.002	581	7.9	24.95	9.247912	22.25108	0.021788
BD	511.9689	575	7.9	24.95	9.247912	21.99193	0.021463
BD	468.5183	548	7.9	24.95	9.247912	20.12548	0.019611
BD	1863.5	849	7.84	26.1	9.21272	75.78422	0.070193
BD	2259.35	872	7.84	26.1	9.21272	91.88252	0.085265
BD	903.0796	723	7.84	26.1	9.21272	36.72615	0.036067
BD	1688.9	831	7.84	26.1	9.21272	68.68364	0.063969
BD	680.9422	642	7.84	26.1	9.21272	27.69234	0.025731
7	300.7128	400	7.84	26.1	9.21272	12.22929	0.011287
BD	506.3442	560	7.84	26.1	9.21272	20.59184	0.019211
BD	258.2091	357	7.84	26.1	9.21272	10.50076	0.009776
149	149.7666	180	7.84	26.1	9.21272	6.090658	0.005657
55	515.494	565	7.84	26.1	9.21272	20.96394	0.019432
BD	1916.45	852	8.03	23.73	9.285545	100.8058	0.093084
BD	1063.8	753	8.03	23.73	9.285545	55.95619	0.052196
BD	650.2961	620	8.03	23.73	9.285545	34.20576	0.031649
BD	1155.65	771	8.03	23.73	9.285545	60.78752	0.05617
BD	1015.55	738	8.03	23.73	9.285545	53.41822	0.049439
BD	728.2912	657	8.03	23.73	9.285545	38.30833	0.035381
14	344.2512	444	8.03	23.73	9.285545	18.10771	0.016794
BD	579.695	594	8.03	23.73	9.285545	30.49212	0.02811
53	626.842	630	8.03	23.73	9.285545	32.97207	0.030634
BD	544.2243	598	8.03	23.73	9.285545	28.62635	0.028328
528	2332.05	877	8.57	25.15	9.241772	409.3845	0.399794
601	1619.8	830	8.57	25.15	9.241772	284.3511	0.275554
BD	1554.9	823	8.57	25.15	9.241772	272.9581	0.261495
BD	1701.05	845	8.57	25.15	9.241772	298.6143	0.294027
599	1653.6	838	8.57	25.15	9.241772	290.2846	0.286655
BD	918.3211	727	8.57	25.15	9.241772	161.2085	0.157515
BD	597.1475	616	8.57	25.15	9.241772	104.8275	0.10328
BD	1289.8	795	8.57	25.15	9.241772	226.4206	0.222064
BD	853.3623	716	8.57	25.15	9.241772	149.8052	0.14804
BD	917.1962	724	8.57	25.15	9.241772	161.0111	0.15688
367	498.4001	553	8.19	24.65	9.257138	39.33145	0.038747
183	579.6409	597	8.19	24.65	9.257138	45.7426	0.045261
63	140.3523	163	8.19	24.65	9.257138	11.07596	0.010802
407	281.5669	384	8.19	24.65	9.257138	22.21996	0.021881
442	138.9943	161	8.19	24.65	9.257138	10.96879	0.010857
68	787.2442	679	8.19	24.65	9.257138	62.1257	0.061129
60	460.4137	533	8.19	24.65	9.257138	36.33373	0.035812
374	128.6542	138	8.19	24.65	9.257138	10.1528	0.010003

BD	972.3054	729	8.19	24.65	9.257138	76.72988	0.076028
	48 254.4488	348	8.19	24.65	9.257138	20.07993	0.019707
	165 225.722	322	7.33	23.05	9.306655	2.357001	0.002252
BD	1572.3	828	7.33	23.05	9.306655	16.41804	0.015805
	417 354.3556	463	7.33	23.05	9.306655	3.7002	0.003556
	447 219.7625	313	7.33	23.05	9.306655	2.294772	0.002213
	477 342.6883	453	7.33	23.05	9.306655	3.578369	0.003419
	541 241.3831	343	7.33	23.05	9.306655	2.520535	0.00243
	460 185.8503	259	7.33	23.05	9.306655	1.940659	0.001867
	357 176.2196	242	7.33	23.05	9.306655	1.840094	0.001764
BD	383.2238	496	7.33	23.05	9.306655	4.001643	0.003955
	494 177.6813	247	7.33	23.05	9.306655	1.855357	0.001778
	284 387.894	478	7.74	25.2	9.240239	11.88395	0.010989
	314 202.7399	275	7.74	25.2	9.240239	6.211362	0.005776
	320 219.3653	298	7.74	25.2	9.240239	6.720718	0.006243
	345 549.4108	585	7.74	25.2	9.240239	16.83236	0.015667
	227 410.9631	497	7.74	25.2	9.240239	12.59072	0.011646
	525 179.2008	233	7.74	25.2	9.240239	5.490194	0.005111
	317 154.0421	189	7.74	25.2	9.240239	4.719403	0.004395
	425 169.599	213	7.74	25.2	9.240239	5.196021	0.004825
	195 459.0821	531	7.74	25.2	9.240239	14.06495	0.013061
	451 167.455	208	7.74	25.2	9.240239	5.130335	0.004752
BD	1701.4	847	6.89	24.34	9.26669	7.116981	0.0071
BD	1193.1	782	6.89	24.34	9.26669	4.990755	0.004915
BD	934.7638	734	6.89	24.34	9.26669	3.910131	0.003865
BD	716.3882	670	6.89	24.34	9.26669	2.996662	0.002995
BD	940.9122	737	6.89	24.34	9.26669	3.935849	0.003927
	347 108.1963	109	6.89	24.34	9.26669	0.452587	0.000444
	82 287.701	407	6.89	24.34	9.26669	1.203458	0.001188
	166 164.3603	225	6.89	24.34	9.26669	0.687522	0.00068
	257 131.7912	165	6.89	24.34	9.26669	0.551284	0.000547
	228 91.37	77	6.89	24.34	9.26669	0.382202	0.000379
BD	1238.7	785	7.9	23.7	9.286474	48.86656	0.047523
	114 356.2258	472	7.9	23.7	9.286474	14.05306	0.013893
BD	917.4012	726	7.9	23.7	9.286474	36.19136	0.035384
	167 496.1192	567	7.9	23.7	9.286474	19.57184	0.019211
BD	716.9496	661	7.9	23.7	9.286474	28.28357	0.027239
BD	1060	764	7.9	23.7	9.286474	41.81687	0.041156
BD	1002.7	748	7.9	23.7	9.286474	39.55639	0.038546
	411 366.6342	479	7.9	23.7	9.286474	14.46367	0.014165
BD	781.5783	689	7.9	23.7	9.286474	30.83316	0.028657
	34 506.7985	570	7.9	23.7	9.286474	19.99313	0.019517
BD	2056.8	865	8.04	22.84	9.313194	104.0978	0.1016
BD	2209.1	874	8.04	22.84	9.313194	111.806	0.109251
	267 223.3514	326	8.04	22.84	9.313194	11.30416	0.011079
BD	977.3611	745	8.04	22.84	9.313194	49.46576	0.048793
	573 258.0844	367	8.04	22.84	9.313194	13.06205	0.012753

562	319.3325	436	8.04	22.84	9.313194	16.16191	0.015848
428	261.1004	418	8.04	22.84	9.313194	13.21469	0.014737
155	330.3165	446	8.04	22.84	9.313194	16.71783	0.016226
578	299.4589	421	8.04	22.84	9.313194	15.15608	0.014911
432	594.631	614	8.04	22.84	9.313194	30.0952	0.029432
21	318.0623	420	8.23	25.65	9.226458	29.12982	0.028362
362	299.9275	403	8.23	25.65	9.226458	27.46895	0.026943
544	536.8533	574	8.23	25.65	9.226458	49.16786	0.048166
346	295.3586	395	8.23	25.65	9.226458	27.0505	0.026441
111	293.1006	391	8.23	25.65	9.226458	26.8437	0.026253
330	180.9642	235	8.23	25.65	9.226458	16.57366	0.016108
515	272.1487	382	8.23	25.65	9.226458	24.92482	0.025272
500	212.4259	290	8.23	25.65	9.226458	19.45508	0.019073
484	306.623	408	8.23	25.65	9.226458	28.08215	0.027439
288	227.3606	308	8.23	25.65	9.226458	20.82289	0.020298
502	257.6334	368	7.96	20.95	9.372465	9.595192	0.009391
333	470.4097	552	7.96	20.95	9.372465	17.51974	0.017093
322	470.1596	555	7.96	20.95	9.372465	17.51043	0.017321
529	237.9895	346	7.96	20.95	9.372465	8.863582	0.008715
488	262.1529	376	7.96	20.95	9.372465	9.763512	0.00953
571	646.0032	641	7.96	20.95	9.372465	24.05948	0.023537
513	616.1869	623	7.96	20.95	9.372465	22.94901	0.022554
533	212.8252	309	7.96	20.95	9.372465	7.926372	0.007834
520	287.2493	405	7.96	20.95	9.372465	10.69819	0.010509
535	84.69065	60	7.96	20.95	9.372465	3.154183	0.003142
BD	2733.6	886	7.86	22.81	9.314129	92.81205	0.091034
BD	1261.1	796	7.86	22.81	9.314129	42.81726	0.043021
BD	3111.1	891	7.86	22.81	9.314129	105.629	0.102686
BD	2090.6	867	7.86	22.81	9.314129	70.98071	0.069097
BD	2111	871	7.86	22.81	9.314129	71.67334	0.070174
38	345.9353	459	7.86	22.81	9.314129	11.7453	0.011395
BD	1354.95	805	7.86	22.81	9.314129	46.00369	0.044619
BD	1273.25	791	7.86	22.81	9.314129	43.22978	0.042231
11	733.0147	671	7.86	22.81	9.314129	24.88755	0.024329
160	388.4361	494	7.86	22.81	9.314129	13.1883	0.012799
238	440.5999	534	8.08	25.95	9.217295	29.93588	0.029226
443	318.5047	435	8.08	25.95	9.217295	21.64031	0.021167
418	321.3498	442	8.08	25.95	9.217295	21.83361	0.021616
491	268.8823	385	8.08	25.95	9.217295	18.26879	0.017777
296	229.3494	335	8.08	25.95	9.217295	15.58279	0.015355
459	188.0393	262	8.08	25.95	9.217295	12.77604	0.012293
348	172.0863	232	8.08	25.95	9.217295	11.69213	0.011324
281	344.0039	460	8.08	25.95	9.217295	23.37281	0.022825
449	152.8717	196	8.08	25.95	9.217295	10.38663	0.010122
510	264.4347	381	8.08	25.95	9.217295	17.96661	0.017666
255	824.524	711	7.9	23.99	9.277499	33.17925	0.0335
475	732.4251	682	7.9	23.99	9.277499	29.47315	0.029828

BD	1931.85	858	7.9	23.99	9.277499	77.7386	0.078273
	490 391.0803	511	7.9	23.99	9.277499	15.73726	0.014574
	94 681.1131	660	7.9	23.99	9.277499	27.40833	0.027684
	399 628.4778	656	7.9	23.99	9.277499	25.29026	0.026981
	39 849.4456	718	7.9	23.99	9.277499	34.18211	0.034642
	400 434.6034	559	7.9	23.99	9.277499	17.48865	0.018998
	546 438.0283	539	7.9	23.99	9.277499	17.62647	0.017832
	473 542.5441	606	7.9	23.99	9.277499	21.83224	0.022053
	543 330.7317	429	7.92	23.07	9.306033	13.06007	0.013068
	328 577.6704	593	7.92	23.07	9.306033	22.81128	0.022913
	219 337.1539	440	7.92	23.07	9.306033	13.31367	0.013589
	335 223.383	301	7.92	23.07	9.306033	8.821035	0.008858
	478 459.8557	532	7.92	23.07	9.306033	18.15897	0.018353
	517 537.6269	573	7.92	23.07	9.306033	21.23002	0.021235
	531 519.595	566	7.92	23.07	9.306033	20.51797	0.020587
	518 356.2591	455	7.92	23.07	9.306033	14.0681	0.014164
	158 349.6083	451	7.92	23.07	9.306033	13.80547	0.013944
	499 373.8716	468	7.92	23.07	9.306033	14.76359	0.014854
BD	2432.25	882	7.95	24.61	9.258369	113.9715	0.120388
BD	2500.65	887	7.95	24.61	9.258369	117.1767	0.128705
	545 264.0868	425	7.95	24.61	9.258369	12.3747	0.014099
	583 715.511	694	7.95	24.61	9.258369	33.52776	0.037225
BD	548.6483	648	7.95	24.61	9.258369	25.70883	0.030033
	589 1251.4	794	7.95	24.61	9.258369	58.63871	0.05926
	596 1202.5	784	7.95	24.61	9.258369	56.34733	0.056349
	505 562.0414	631	7.95	24.61	9.258369	26.33641	0.029011
	600 726.9139	680	7.95	24.61	9.258369	34.06208	0.034468
	552 1263.3	799	7.95	24.61	9.258369	59.19632	0.059544
BD	1490.8	825	7.66	22.12	9.335684	30.8082	0.030844
BD	3460.4	894	7.66	22.12	9.335684	71.51106	0.071084
BD	1458.85	817	7.66	22.12	9.335684	30.14793	0.030316
	338 741.1158	678	7.66	22.12	9.335684	15.31556	0.01506
	526 1717.85	848	7.66	22.12	9.335684	35.50031	0.035515
BD	1629.5	840	7.66	22.12	9.335684	33.67451	0.033788
BD	2187.55	876	7.66	22.12	9.335684	45.20692	0.045125
BD	1028.55	761	7.66	22.12	9.335684	21.25555	0.021381
BD	2813.35	889	7.66	22.12	9.335684	58.13942	0.058579
	538 949.7555	742	7.66	22.12	9.335684	19.62722	0.019846
BD	1623.5	839	7.76	20.57	9.384474	37.65197	0.03789
	574 1083.15	773	7.76	20.57	9.384474	25.12025	0.025226
	585 1481.85	820	7.76	20.57	9.384474	34.36684	0.034269
	584 604.0121	621	7.76	20.57	9.384474	14.00816	0.013983
	523 649.3601	649	7.76	20.57	9.384474	15.05986	0.015
	572 404.2687	521	7.76	20.57	9.384474	9.375738	0.009398
	430 1037.8	766	7.76	20.57	9.384474	24.0685	0.024198
	381 835.9592	712	7.76	20.57	9.384474	19.38744	0.019403
	472 1039.45	763	7.76	20.57	9.384474	24.10677	0.02419

	511	629.3694	637	7.76	20.57	9.384474	14.59624	0.014587
	564	816.2778	708	7.8	21.96	9.340697	22.84614	0.022951
	550	910.8352	732	7.8	21.96	9.340697	25.49263	0.02565
	542	759.1574	683	7.8	21.96	9.340697	21.24744	0.021343
	591	755.3092	685	7.8	21.96	9.340697	21.13974	0.021376
	579	579.0432	615	7.8	21.96	9.340697	16.20637	0.016375
	536	669.4633	672	7.8	21.96	9.340697	18.73706	0.020262
	509	756.3159	684	7.8	21.96	9.340697	21.16791	0.021372
	566	462.9644	556	7.8	21.96	9.340697	12.95753	0.013023
	565	718.5835	676	7.8	21.96	9.340697	20.11185	0.020291
	548	812.2923	709	7.8	21.96	9.340697	22.73459	0.022981
	363	91.91415	64	7.79	19.82	9.408267	2.161621	0.002154
	427	177.968	228	7.79	19.82	9.408267	4.185419	0.004232
	148	302.1564	401	7.79	19.82	9.408267	7.10606	0.007043
	305	91.5924	63	7.79	19.82	9.408267	2.154054	0.00215
	368	76.0093	42	7.79	19.82	9.408267	1.787573	0.001785
	482	78.149	43	7.79	19.82	9.408267	1.837894	0.001822
	395	125.8323	133	7.79	19.82	9.408267	2.959301	0.002956
	408	58.31675	23	7.79	19.82	9.408267	1.371483	0.001364
BD		764.666	686	7.94	21.27	9.362376	27.85974	0.027829
BD		624.2532	632	7.94	21.27	9.362376	22.74396	0.022571
	178	507.1988	580	7.94	21.27	9.362376	18.47922	0.018418
	144	706.0931	668	7.94	21.27	9.362376	25.7257	0.025917
BD		408.29	522	7.94	21.27	9.362376	14.87559	0.014819
	121	459.4168	554	7.94	21.27	9.362376	16.73833	0.016847
BD		767.9523	690	7.94	21.27	9.362376	27.97948	0.028033
BD		512.5634	582	7.94	21.27	9.362376	18.67467	0.018563
	221	669.8349	655	7.72	19.17	9.428987	12.8403	0.012841
	86	1236.6	790	7.72	19.17	9.428987	23.70481	0.023772
	225	266.9202	387	7.72	19.17	9.428987	5.116684	0.005068
	521	149.4221	197	7.72	19.17	9.428987	2.864324	0.002859
	325	471.8952	563	7.72	19.17	9.428987	9.045921	0.009092
	242	236.7028	350	7.72	19.17	9.428987	4.537437	0.004536
	423	50.2816	18	7.72	19.17	9.428987	0.963865	0.000955
	406	109.7986	120	7.72	19.17	9.428987	2.104766	0.0021
BD		1491.65	819	7.86	19.77	9.409858	40.90106	0.040413
BD		1442.75	814	7.86	19.77	9.409858	39.56022	0.039326
	377	97.2808	90	7.86	19.77	9.409858	2.66744	0.00265
	134	525.6386	588	7.86	19.77	9.409858	14.41301	0.014316
	243	382.21	501	7.86	19.77	9.409858	10.4802	0.010472
	230	345.6103	464	7.86	19.77	9.409858	9.476636	0.009387
	110	243.5292	359	7.86	19.77	9.409858	6.677572	0.006661
BD		653.3785	652	7.86	19.77	9.409858	17.91564	0.017854
	445	273.3272	393	7.51	21.63	9.351053	3.885194	0.003874
	480	86.71875	66	7.51	21.63	9.351053	1.232659	0.001218
	522	143.5572	187	7.51	21.63	9.351053	2.040586	0.002024
	397	166.1112	231	7.51	21.63	9.351053	2.361178	0.002363

	386	213.1778	316	7.51	21.63	9.351053	3.030204	0.003019
	470	144.2205	190	7.51	21.63	9.351053	2.050014	0.002047
	487	160.7873	219	7.51	21.63	9.351053	2.285502	0.002266
	436	275.0289	398	7.51	21.63	9.351053	3.909383	0.003912
	207	360.2649	477	7.87	20.07	9.400323	10.31994	0.010257
	32	291.4874	417	7.87	20.07	9.400323	8.34978	0.008322
BD		625.1533	634	7.87	20.07	9.400323	17.90778	0.01787
	598	241.0335	354	7.87	20.07	9.400323	6.904507	0.006852
	593	169.1748	238	7.87	20.07	9.400323	4.846082	0.004807
	463	505.8694	578	7.87	20.07	9.400323	14.49084	0.014438
	199	503.2924	577	7.87	20.07	9.400323	14.41702	0.014372
	569	421.2976	529	7.87	20.07	9.400323	12.06825	0.012099
BD		1430.25	812	8.34	12.61	9.643371	67.75828	0.067646
BD		1762.75	853	8.34	12.61	9.643371	83.51051	0.083868
	16	719.7909	662	8.34	12.61	9.643371	34.10019	0.032902
BD		1205.7	780	8.34	12.61	9.643371	57.1202	0.054304
BD		1012.35	756	8.34	12.61	9.643371	47.96021	0.047478
BD		1938.9	856	8.34	12.61	9.643371	91.85564	0.090533
BD		663.6145	650	8.34	12.61	9.643371	31.43882	0.030774
BD		1051.15	765	8.34	12.61	9.643371	49.79837	0.049427
BD		1381.55	808	8.04	11.03	9.696486	29.81304	0.029642
BD		973.5162	749	8.04	11.03	9.696486	21.00791	0.021177
	177	1433.95	815	8.04	11.03	9.696486	30.94381	0.031237
BD		958.3699	739	8.04	11.03	9.696486	20.68106	0.020405
	133	813.2753	704	8.04	11.03	9.696486	17.55001	0.017601
	298	802.4914	696	8.04	11.03	9.696486	17.3173	0.017194
	311	622.3854	629	8.04	11.03	9.696486	13.43071	0.013272
BD		841.467	715	8.04	11.03	9.696486	18.15837	0.018185
	549	510.3279	561	7.86	11.44	9.682646	7.56342	0.007487
	310	787.4708	677	7.86	11.44	9.682646	11.67087	0.011495
	350	422.8021	504	7.86	11.44	9.682646	6.266225	0.00618
	577	591.7222	607	7.86	11.44	9.682646	8.769741	0.008809
	561	257.9439	351	7.86	11.44	9.682646	3.822911	0.003818
	466	159.5916	194	7.86	11.44	9.682646	2.36526	0.00233
	580	582.9223	599	7.86	11.44	9.682646	8.63932	0.008681
	563	294.5719	392	7.86	11.44	9.682646	4.365763	0.004376
	307	638.6516	646	7.93	10.98	9.698176	10.70887	0.010709
	59	704.9049	663	7.93	10.98	9.698176	11.8198	0.011732
	507	1936.4	857	7.93	10.98	9.698176	32.46944	0.032278
	558	622.9345	636	7.93	10.98	9.698176	10.44533	0.010525
	392	491.3021	572	7.93	10.98	9.698176	8.238124	0.008307
	587	403.8667	519	7.93	10.98	9.698176	6.772012	0.006763
	424	1027.1	757	7.93	10.98	9.698176	17.22235	0.017031
	575	452.2593	542	7.93	10.98	9.698176	7.583456	0.007491
	383	932.0218	735	8.16	11.08	9.694796	26.43232	0.026462
	588	442.7197	540	8.16	11.08	9.694796	12.55562	0.012575
	592	601.9632	618	8.16	11.08	9.694796	17.0718	0.017007

324	461.6157	549	8.16	11.08	9.694796	13.09151	0.012973
586	392.2751	509	8.16	11.08	9.694796	11.125	0.011171
568	341.4224	461	8.16	11.08	9.694796	9.682807	0.009567
594	534.4118	592	8.16	11.08	9.694796	15.15603	0.015045
595	302.1353	428	8.16	11.08	9.694796	8.568617	0.008618
119	1058.375	768	8.22	11.15	9.692431	34.49975	0.034326
105	1509.9	824	8.22	11.15	9.692431	49.21806	0.048568
234	461.8955	551	8.22	11.15	9.692431	15.05636	0.014925
402	629.7655	638	8.22	11.15	9.692431	20.5284	0.020529
229	943.5556	740	8.22	11.15	9.692431	30.75699	0.030839
37	1279.1	800	8.22	11.15	9.692431	41.6947	0.041763
141	446.9334	544	8.22	11.15	9.692431	14.56864	0.014685
530	579.6894	603	8.22	11.15	9.692431	18.89608	0.017766

Draft