Identification of Bivalve Species at Commencement Bay

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Purpose

The Urban Waters Initiative was conducted by the Washington State Department of Ecology which researchers studied 30 sites of Commencement Bay and took sediment samples which contained benthic organisms (Partridge 2010). Students at the University of Washington of Tacoma studied 5 of these sites to compare results of benthic richness. However, many of the taxonomic groups contained many unidentified species that could have led to errors in the results. This research focused at the bivalves found at these 5 sites to re-identify the species that were found.

Methods

After processing by the students, all bivalves were contained in small vials that were labeled by species with the site they were found. The specimens of each vial were carefully studied to determine that all specimens were one species. Once each specimen is identified, it was transferred to the vial of the same species of the same site it was found. Specimens that were re-identified were relabeled as such. This transfer was documented to make sure all specimens were accounted for. Specimens were identified by an identification book on bivalve species (Coan 2000). Findings were compared to what previous students have found.

Bivalves

Species that were discovered by this research. An ID guide of these bivalve species was made.

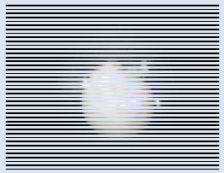

Figure 1. Parvilucina tenuisculpta

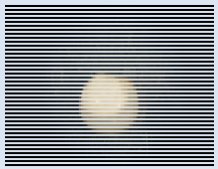

Figure 2. Axinopsida serricata

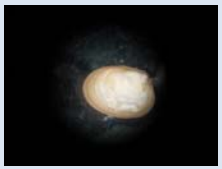

Figure 3. Rochefortia tumida

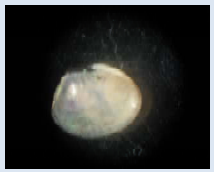

Figure 4. Macoma sp

Figure 5. Nemocardium centrifilosum

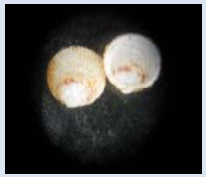

Figure 6. Clinocardium nuttallii

Figure 7. Compsomyax subdiaphana

Figures

Bivalves	Sites									
	285	285	287	287	292	292	296	296	304	304
Axinopsida serricata	10	10	150	150	58	58	37	37	17	17
Parvilucina tenuisculpta	28	28	36	36	2	2	5	5	5	4
Rochefortia tumida	0	0	1	1	2	2	1	1	0	0
Macoma sp	1	3	41	41	17	17	10	10	4	5
Compsomyax subdiaphana	0	0	3	3	0	2	0	0	0	0
Lucinoma annulata	0	0	0	0	2	0	0	0	0	0
Unknown	2	2	0	0	3	1	1	0	0	0
Nemocardium centrifilosum	0	0	0	0	0	2	0	0	0	0
Clinocardium nuttalli	0	0	0	0	0	0	0	1	0	0

Figure 8. Number of species per site from before (yellow columns) and after (red columns).

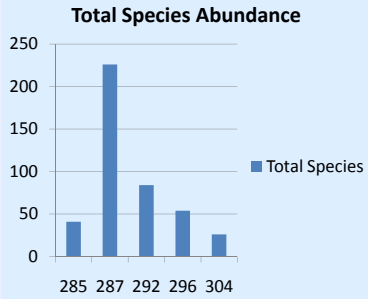

Figure 9. Abundance of all species per site

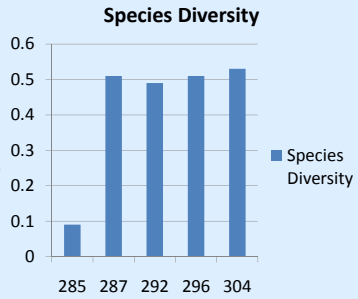

Figure 10. Species diversity per site

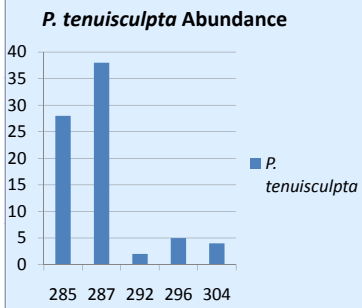

Figure 11. Abundance of P. tenuisculpta per site

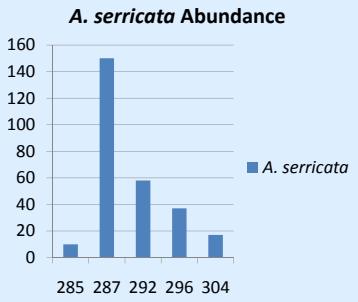

Figure 12. Abundance of A. serricata per site

Map

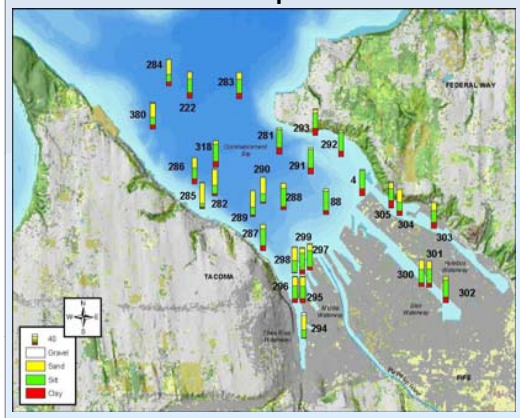

Figure 13. Map of Commencement Bay and site locations. Bar graphs show percent sediment with yellow as sand, green as silt and red as clay.

Results

Compared to past results, there were very few changes to the number of specimens per species. Most species were identified with some new species that were not accounted for by the previous students (Figures 1-7). Figure 8 shows results from previous students at UWT in yellow columns, while my results are shown in red columns. Figure 9 shows a high abundance of site 287 compared to the other sites. Site 285 had the least diverse population compared to other sites (Figure 10). *P. tenuisculpta* and *A. serricata* were both abundant at site 287, however, *P. tenuisculpta* was abundant at site 285 also and *A. serricata* was not (Figures 11 and 12). Sediment deposition may have had an affect of species populations (Figure 13).

Conclusion

The re-identification of the specimens was not much different from what the previous students had found. Some unknown specimens were identified; however, there were only a few unknown specimens that were found at the sites and therefore would not change bivalve species diversity. There was more than one *Macoma sp* vials for each site but due to the transparent texture of the shell I was not able to identify the species without finding the palial sinus which distinguishes each species. Therefore all *Macoma* species were all identified as one category on the species table.

Acknowledgements

I would like to thank Dr. Bonnie Becker and the previous students whose research helped make this possible.

References

Patridge V, Weakland S, Long E, Welch K, Ducth M. 2010. Urban Waters Initiative, 2008: Sediment Quality in Commencement Bay. Tacoma (WA). Washington State Department of Ecology. Report No: 10-03-019

Coan EV, Valentich-Scott P, and Bernard FR. 2000. Bivalve Seashells of Western North America: Marine Bivalve Mollusks from Arctic Alaska to Baja California. Santa Barbara Museum of Natural History, Santa Barbara, California.764 pp.