Over 1200 unique taxa of benthic, or bottom-dwelling, invertebrates (also known as benthos) live in the soft sediments of Puget Sound. Benthos are a critical part of the Puget Sound food web.

The Washington State Department of Ecology (Ecology) has surveyed the condition of benthic invertebrate assemblages and their associated sediments throughout Puget Sound (see map below) since 1989 as part of the Puget Sound Ecosystem Monitoring Program (PSEMP) (Dutch et al., 2009).

Data from these surveys are used to calculate various sediment quality indicators (Dutch et al., 2014), including a Benthic Infaunal Index, which inform regional environmental managers and policy makers about sediment and benthos condition.

The Importance of Consistent Taxonomic Nomenclature

The PSEMP is a status and trends program which examines change in condition of the benthos over time. It is therefore essential that the taxonomic nomenclature, the scientific system used to name different taxa, is applied consistently to organisms collected from different locations over many years.

While the taxonomic work for our program has been conducted primarily by the same regional specialists since 1989, this will not always be the case. To ensure that the nomenclature remains consistent in future years, the literature and morphological features currently used to identify each animal must be documented by Ecology staff so that new taxonomists will generate consistent, comparable data.

Two types of products are being prepared to aid with consistency of future taxonomic work:
(1) voucher sheets, one for each recognized species.
(2) workshop notes, from trainings with regional taxonomists, including photographs of key taxonomic features, compiled for groups of related species.
Taxonomic Voucher Sheets

Ecology staff and regional taxonomists have begun to develop voucher sheets for over 1200 recognized taxa of Puget Sound benthic invertebrates. Each sheet includes: (1) taxonomic nomenclature, (2) original and later descriptions, (3) a list of Ecology voucher specimens examined, (4) habitat information, (5) diagnostic characteristics, (6) characteristics of related species, (7) comments, and (8) citations of published taxonomic literature used to identify each taxon. Each sheet is verified by a regional expert prior to finalization. Voucher sheets developed to date are listed below. They are posted to Ecology’s website and accessible through the “Taxonomic guides” link provided on the previous page.

**Phylum Annelida**

- *Ampharete acutifrons*
- *Ampharete cf. crassistea*
- *Ampharete finnarchica*
- *Ampharete goesi brazhnikovi*
- *Ampharete labrops*
- *Ampharete sp. N1*
- *Aphelochaeta glandaria Complex*
- *Aphelochaeta monilaris*
- *Aphelochaeta sp. N5*
- *Aphelochaeta sp. N6*
- *Glycera americana*
- *Glycera macrobranchia*
- *Glycera nana*
- *Glycera oxycephala*
- *Glycera robusta*
- *Hemipodia simplex*
- *Monticellina serratiseta*

Figure 3. Example of diagnostic characteristics recorded on a voucher sheet for the polychaete *Aphelochaeta monilaris*.

**Phylum Arthropoda**

- *Americhelidium millsi*
- *Americhelidium pectinatum*
- *Americhelidium rectipalmum*
- *Americhelidium shoemakeri*
- *Cheirimeda zotea*
- *Crangon alaskensis*
- *Desdimelita californica*

Figure 4. Example of diagnostic characteristics recorded on a voucher sheet for the amphipod *Cheirimeda zotea*.

**Taxonomic Workshop Notes**

Polychaete taxonomy workshops were conducted at Ecology’s benthic laboratory from July 2013 through August 2014. These sessions were led by Kathy Welch, Ecology’s taxonomic specialist. A total of 20 polychaete families and 127 species were reviewed during these workshops. They are listed in the table on the following page. Key morphological features for Puget Sound species were described and photographed, peer-reviewed taxonomic literature was consulted and referenced, and notes were generated. Notes for each workshop are posted to Ecology’s website, accessible through the “Taxonomic guides” link provided on the previous page.

---

1 recently retired from the Department of Ecology
# Phylum Annelida: Polychaete families and species examined

## Ampharetidae
- Amage anops
- Ampharete labrops
- Anobothrus gracilis

## Apistobranchidae
- Apistobranchus ornatus
- Apistobranchus tullbergi

## Capitellidae
- Barantolla nr. americana
- Capitella capitata Complex
- Heteromastus filobranchus
- Mediomastus ambiseta
- Mediomastus californiensis
- Notomastus hemipodus
- Notomastus latericius

## Cirratulidae
- Aphanochaeta glandaria Complex
- Aphanochaeta monilaris
- Aphanochaeta sp. N5
- Caulleriella pacifica
- Chaetozone acuta
- Chaetozone bansei
- Chaetozone commonalis
- Chaetozone setosa Complex
- Cirratulus robustus
- Cirratulus spectabilis
- Monticellina serratitasa
- Monticellina sp. N1
- Monticellina tesselata
- Tharyx parvus
- Tharyx sp. N1

## Cossuridae
- Cossura bansei
- Cossura pygodaclata

## Hesionidae
- Heteropodarke heteromorpha
- Micrphthalmus spp.
- Micropodarke dubia
- Oxydromus pugettensis
- Podarkeopsis glabrus

## Lumbrineridae
- Eranno bicirrata
- Lumbrineris californiensis
- Lumbrineris cruzensis
- Ninoe gemmea
- Scoletoma luti

## Magelonidae
- Magelona longicornis
- Magelona berkeleyi
- Magelona sacculata

## Maldanidae
- Achiotella rubrocincta
- Chirimia similis
- Chirimia nr. biceps
- Clymenura columbiana
- “Clymenura” gracilis
- Euclymene cf. zonalis
- Isoirrus longiceps
- Maldane sarsi
- Nicomache personata
- Nicomache lumbricalis
- Notoproctus pacificus
- Petaloproctus borealis
- Petaloproctus tenuis
- Praxillella gracilis
- Praxillella pacifica
- Rhodine bitorquata

## Nephtyidae
- Bipalponephys cornuta
- Nephtys caeca
- Nephtys caecoides
- Nephtys ferruginea
- Nephtys glabra
- Nephtys longosetosa
- Nephtys punctata

## Nereididae
- Alitta virens
- Cheilonereis cyclerus
- Hediste limnicola
- Nereis proceru
- Platynereis bicanaliculata

## Oenonidae
- Drilonereis longa
- Notocirrus californiensis

## Orbinidae
- Leitoscoloplos pugettensis
- Naineris uncinata
- Naineris quadricuspida
- Phylox flex
- Scoloplos armiger

## Phyllodocidae
- Eteone californica
- Eteone cumbiensis
- Eteone lepotes
- Eteone pacifica
- Eulalia californiensis
- Eulalia quadriculata
- Eumida longicornuta
- Hesionura coineaui difficilis
- Nereithylla castanea

## Polynoidae
- Bipalponephtys cornuta
- Heteropodarke heteromorpha
- Lepidasthenia berkeleyae
- Lepidasthenia longicornuta
- Malgremiella bansei
- Tenonia priops

## Sabellariidae
- Idanthynys saxicavus
- Neosabbellaria cementarium

## Scalibregmatidae
- Asclerocoeilus beringianus
- Scalibregma californicum
- Travisia brevis
- Travisia pura

## Sphaerodoridiae
- Sphaerodarops minuta
- Sphaerodarops sphaerulifer

## Spiionidae
- Boccardiella hamata
- Boccardia pugettensis
- Dipolydora brachycephala
- Dipolydora socialis
- Laonice cirrata
- Paraprionospio alata
- Polydora limicola
- Prionospio (Minuspio) lighti
- Prionospio (Prionospio) steenstrupi
- Pseudopolydora kempii
- Pygospio elegans
- Rhynchospio arenicola
- Scolelepis squamata
- Spiio cirrifer
- Spiophanes berkeleyorum
- Spiophanes norrisi

## Terebellidae
- Polyceirrus californicus
- Artacama coniferi
- Lanassa venusta
- Amphitrite robusta
- Pista wui
Figure 5. Examples of diagnostic characteristics recorded in workshop notes for the polychaete *Phylo felix*.
A. Anterior end, dorsolateral view; note pointed prostomium.
B. Fringed postsetal neuropodial lobes.
C. Thoracic neuropodial spines.

### Summary and Future Work

This report describes two types of taxonomic products generated for PSEMP benthos monitoring. Descriptions have been generated for 152 soft sediment taxa to date. We emphasize that these tools are needed to maintain the consistency and integrity of long-term benthos data generated for this program and for other Puget Sound and greater Salish Sea benthos monitoring programs.

To accomplish this critical task, Ecology’s Sediment Monitoring Team will (1) continue to create these documents for the remaining 1000+ taxa identified by the PSEMP and (2) encourage contributions and partnerships with other Salish Sea taxonomists and benthic ecologists.

### References


\(^2\) Now called the Puget Sound Ecosystem Monitoring Program.

### Department of Ecology Contacts

<table>
<thead>
<tr>
<th>Name</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margaret Dutch</td>
<td>(360) 407-6021</td>
<td><a href="mailto:margaret.dutch@ecy.wa.gov">margaret.dutch@ecy.wa.gov</a></td>
</tr>
<tr>
<td>Environmental Assessment Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.O. Box 47600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olympia, WA 98504-7600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications Consultant</td>
<td>(360) 407-6764</td>
<td></td>
</tr>
<tr>
<td>Headquarters, Olympia</td>
<td>(360) 407-6000</td>
<td></td>
</tr>
<tr>
<td>Northwest Regional Office, Bellevue</td>
<td>(425) 649-7000</td>
<td></td>
</tr>
<tr>
<td>Southwest Regional Office, Olympia</td>
<td>(360) 407-6300</td>
<td></td>
</tr>
<tr>
<td>Central Regional Office, Yakima</td>
<td>(509) 575-2490</td>
<td></td>
</tr>
<tr>
<td>Eastern Regional Office, Spokane</td>
<td>(509) 329-3400</td>
<td></td>
</tr>
</tbody>
</table>

If you need this document in a format for the visually impaired, call 360-407-6764.  
Persons with hearing loss can call 711 for Washington Relay Service.  
Persons with a speech disability can call 877-833-6341.

This report is available on the Department of Ecology’s website at https://fortress.wa.gov/ecy/publications/SummaryPages/1403201.html.

Data for this project are available at Ecology’s Environmental Information Management (EIM) website at www.ecy.wa.gov/eim/index.htm. Search Study ID, PSAMP_SP.