

Chapter 9C2. Focal Taxonomic Collections: Planktonic Cnidaria, Ctenophora, and Pelagic Mollusca

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Methods

Medusae, ctenophores, and pelagic molluscs were collected at sites in both Prince William Sound and Cook Inlet from August 8–14, 1999 using small plankton nets and a water scoop attached to a long handle. Specimens were examined in the field, relaxed, and fixed for transport to the laboratory. Specimens were reexamined microscopically at the Friday Harbor Laboratories in September 1999, in order to verify or assign species names.

Results

All pelagic Hydrozoa, Scyphozoa, Ctenophora and Mollusca are identified by site in Table 9C2.1. Separate species lists for these groups follow for Prince William Sound (Table 9C2.2) and Cook Inlet (Table 9C2.3). An annotated species list follows (Table 9C2.4), including all species on both lists. In the time allotted to this project, I do not feel that I completed a comprehensive search of the literature for species previously collected in Prince William Sound and Cook Inlet, but no other papers came to mind. I also did not search for unpublished data at the University of Alaska.

A few coelenterates were conspicuously missing from the region. We saw no stauromedusae, no *Epiactis* anemones on eelgrass, no *Chrysaora* or *Phacellophora* scyphomedusae, and no *Anthopleura elegantissima* or *A. xanthogrammica*.

No known nonindigenous species of planktonic Cnidaria or Ctenophora were collected in Prince William Sound or Cook Inlet by our scientific teams in either 1998 or 1999. In the 1999 expedition, 15 species of Hydrozoa were collected (including 3 hydroids [see section 9D. Fouling Communities) for more thorough hydroid work-up] and 14 species of hydromedusae), two scyphomedusae and unidentified scyphozoan polyps (scyphistomae), and two species of ctenophores. Two molluscan species were also taken in the water column.

The following species appear to be new records in the Prince William Sound region:

Hydromedusae

**Aequorea aequorea*

**Aequorea victoria*

**Clytia gregaria* (= *Phialidium gregarium*)

Eperetmus typus

Euphysa sp.

Gonionemus vertens

Halitholus sp.

**Melicertum octocostatum*

**Proboscidactyla flavicirrata*

Sarsia spp.

Tiaropsis multicirrata

Ctenophora:

**Bolinopsis infundibulum*

**Pleurobrachia bachei*

New NAME for common **Scyphomedusa**

Aurelia labiata

* indicates common species whose presence in PWS may be known, but I have not seen reports in print. Dr. Jennifer Purcell (Horn Point Laboratory, University of Maryland) is working with some of these, but her results are unpublished as yet.

Following the annotated species list is a list and discussion of nonindigenous cnidarian species already present in some west coast estuaries that might be positioned to ultimately invade locations in Alaska. This list is accompanied by an Appendix (following the report) titled “Commentary on species of Hydrozoa, Scyphozoa and Anthozoa (Cnidaria) sometimes listed as non-indigenous in Puget Sound”, reprinted from Cohen *et al.* (1998). References are given at the end of the main report as well as the Appendix.

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Table 9C2..2. Prince William Sound species list. See Table 1 for specific locations. Collections and identifications by Claudia E. Mills, unless otherwise noted.

HYDROZOA	REFERENCE
<i>Aequorea aequorea</i> v. <i>albida</i>	PWS 99; Purcell, 1998
<i>Aequorea victoria</i> / <i>A. aequorea</i> v. <i>aequorea</i>	Purcell, personal communication 1999
<i>Catablema multicirrata</i>	Bigelow, 1913
<i>Clytia gregaria</i> (= <i>Phialidium gregarium</i>)	PWS 99
<i>Eperetmus typus</i>	PWS 98, PWS 99
<i>Euphysa</i> sp.	PWS 99
<i>Gonionemus vertens</i>	PWS 99
<i>Halitholus</i> sp.	PWS 99
<i>Melicertum octocostatum</i>	PWS 99
<i>Obelia longissima</i>	PWS 98
<i>Obelia?</i> spp. hydroids	PWS 99
<i>Proboscidactyla flavicirrata</i>	PWS 99
<i>Sarsia</i> spp. medusae	PWS 99
<i>Staurophora mertensii</i>	Bigelow, 1913
<i>Tiaropsis multicirrata</i>	PWS 98
SCYPHOZOA	
<i>Aurelia</i> " <i>aurita</i> " (Mills quotes)	Purcell, 1998
<i>Aurelia labiata</i>	PWS 99
<i>Cyanea capillata</i>	PWS 99; Purcell, 1998
Unidentified scyphistomae (probably <i>Aurelia</i> sp.)	PWS 99
CTENOPHORA	
<i>Bolinopsis infundibulum</i>	PWS 99
<i>Pleurobrachia bachei</i>	PWS 99; Purcell, 1998
MOLLUSCA	
<i>Melibe leonina</i>	PWS 99

* PWS 98 refers to specimens collected by Ruiz *et al.*, June 1998 in Cook Inlet.

PWS 99 refers to specimens collected by Greg Ruiz *et al.*, August 1999 in Cook Inlet.

Table 9C2.3. Cook Inlet species list.
Collections and identifications by Claudia E. Mills, unless otherwise noted.

HYDROZOA	*REFERENCE AND LOCATION
<i>Aequorea aequorea v. albida</i>	PWS 99 - Homer Marina
<i>Aglantha digitale</i>	PWS 99 - Sadie Cove, Katchemak Bay
<i>Bougainvillia ?superciliaris</i>	PWS 99 - Sadie Cove, Katchemak Bay
<i>Clytia gregaria</i> (= <i>Phialidium gregarium</i>)	PWS 99 - Sadie Cove, Katchemak Bay
<i>Eperetmus typus</i>	PWS 99 - Sadie Cove, Katchemak Bay
<i>Eutonina indicans</i>	PWS 99 - Homer Marina
<i>Leuckartiara</i> sp.	PWS 99 - Sadie Cove, Katchemak Bay
<i>Melicertum octocostatum</i>	PWS 99 - Homer Marina
<i>Mitrocoma cellularia</i>	PWS 99 - Homer Marina
<i>Obelia?</i> sp. hydroids	PWS 99 - Homer Marina
<i>Proboscidactyla flavicirrata</i> hydroids	PWS 99 - Homer Marina
<i>Sarsia/Coryne</i> sp. hydroids	PWS 99 - Homer Marina
<i>Sarsia</i> spp. medusae	PWS 99 - Homer Marina, Sadie Cove
SCYPHOZOA	
<i>Cyanea capillata</i>	PWS 99 - Homer Marina, Sadie Cove
Unidentified scyphistomae (probably <i>Aurelia</i> sp.)	PWS 99 - Homer Marina
CTENOPHORA	
(none)	
MOLLUSCA	
? <i>Clione limacina</i>	PWS 99 - Homer marina
<i>Melibe leonina</i>	PWS 99 - not collected but told of site at Jakalof Bay by Carmen Field

* PWS 99 refers to specimens collected by Ruiz *et al.*, August 1999 in Cook Inlet.

Table 9C2.4

PRINCE WILLIAM SOUND ANNOTATED SPECIES LIST

(combines both Cook Inlet and Prince William Sound locations)

HYDROZOA

Aequorea aequorea var. *albida*

Distribution. Most of the *Aequorea* medusae that we saw were beached. Such specimens were seen at the Homer Marina, Lowell Point in Seward, the Whittier Marina, and in Cordova and Valdez. A few were seen in the water while underway south of Esther Island, along with *Cyanea capillata*.

Remarks. This name was applied by Bigelow (1913) to *Aequorea* specimens measuring 120 mm and 165 mm bell diameter, collected in Dutch Harbor. Such very-large *Aequorea* occur throughout southern Alaska, and are accompanied in some places by smaller specimens that seem very similar to *Aequorea victoria* at Friday Harbor (called *Aequorea aequorea* var. *aequorea* by Bigelow, 1913). Whether they are different sizes of the same species or 2 different species has still not been resolved (even the modern use of "*A. victoria*" as species name for Friday Harbor medusae is controversial). Only large-sized specimens (most 120-160 mm diameter) were seen in Prince William Sound in August 1999. Similar large *Aequoreas* in Prince William Sound were called *A. victoria* by Purcell (1998).

Aequorea victoria or *Aequorea aequorea* var. *aequorea*

Remarks. We did not collect any smaller specimens of *Aequorea*, but I am told by Dr. Jennifer Purcell, who has been doing a recent plankton study in Prince William Sound that small *Aequoreas* that look like those at Friday Harbor are also present. Bigelow (1913) calls these *A. aequorea* var. *aequorea*. Arai and Brinckmann-Voss later applied the name *A. victoria* to the same animals. It is not clear to me that *A. victoria* is not a junior synonym to *A. aequorea*.

Aglantha digitale

Distribution. Several *Aglantha digitale* medusae were collected at the head of Sadie Cove, Katchemak Bay, on August 8, 1999, by dipping from a small boat in about 8 feet of water. Most were within a layer of fresher water that occupied the upper 15" of the water column and were dead and decomposing. Many others were seen, but not collected.

Remarks. There is no question about the identification of this material, although why these medusae were in the layer of low salinity water is not clear. This circumpolar species is well known in the North Pacific, North Atlantic and Arctic Oceans, including the Bering Sea.

Bougainvillia ?superciliaris

Distribution. Five *Bougainvillia ?superciliaris* medusae were collected at the head of Sadie Cove, Katchemak Bay, on August 8, 1999, by dipping from a small boat in about 8 feet of water. All were below a layer of fresher water that occupied the upper 15" of the water column. Several others were seen, but not collected.

Remarks. These 6-12 mm high specimens best correspond with the description of *Bougainvillia superciliaris*, having its characteristic prominent peduncle above the manubrium. The Sadie Cove specimens had 36-40 tentacles on each of the four marginal bulbs, which is quite a bit higher than the

10-22 tentacles described for *B. superciliaris* in Kramp (1961). Bigelow (1913) found a single specimen of *B. superciliaris* of the same size off Attu Island in the Aleutians, but also with less than 20 tentacles in each group. This tentacle number discrepancy leads to the question about species identification for the Sadie Cove material.

Catablema multicirrata

Distribution. This species (2 medusae) was collected by Bigelow (1913) off Orca in Prince William Sound on July 19, 1906.

Remarks. We did not find it in August 1999, but did not sample at that location.

Clytia gregaria (= *Phialidium gregarium*)

Distribution. Many individuals of this species were collected in Sadie Cove, Katchemak Bay and in Fairmount Bay, Tatitlek, off Busby Island and in the Cordova Marina.

Remarks. Most of the specimens correspond well to the description of *Clytia gregaria* (as *Phialidium gregarium*) in Kramp (1961), with about 40 tentacles and a few rudimentary bulbs alternating with marginal vesicles in 12 mm diameter medusae; the gonads were on the distal 1/2 of the radial canals. Some smaller medusae (7 mm diameter), with a few less tentacles and shorter gonads may be *C. gregaria*, or could be *C. lomae*, looking very similar to specimens collected in September 1998 in Puget Sound by Claudia Mills and Erik Thuesen. Seasonal morphological variation with changes in zooplankton prey availability have not been described, so it is difficult to be positive about the species name in some cases. The genus name *Clytia* has typically been applied only to the hydroid form, but it is an older genus name than *Phialidium*, and should be applied to both phases of the life cycle.

Eperetmus typus

Distribution. One young *Eperetmus typus* medusa was collected at the head of Sadie Cove, Katchemak Bay, on August 8, 1999, by dipping from a small boat in about 8 feet of water. It was below a layer of fresher water that occupied the upper 15" of the water column. Three more *Eperetmus typus* medusae were collected in Fairmount Bay, Prince William Sound, in vertical plankton tows taken off the side of the *Kristina* with Jeff Cordell's 130 µm mesh plankton net in about 70- 90 feet of water.

Remarks. These 8-12 mm diameter immature specimens were very lively swimmers, that sank rapidly when they were not swimming. Both locations were protected coves and in both cases the animals may have been fairly near the bottom, but not enough is known to verify whether this species is indeed typical of protected coves and associated with the bottom in the same way as *Gonionemus* or *Polyorchis*.

Euphysa sp.

Distribution. Three small *Euphysa* sp. medusa were collected in Fairmount Bay, Prince William Sound, in vertical plankton tows taken off the side of the *Kristina* with Jeff Cordell's 130 µm mesh plankton net in about 70- 90 feet of water on August 10, 1999.

Remarks. These 1.5–3.5 mm high medusae were found in the lab by Jeff Cordell in his plankton tow material. The two smaller specimens clearly had 3 larger tentacles and either one small tentacle or one

bare bulb. The larger specimen had 4 tentacles. There is insufficient information to assign them to species.

Eutonina indicans

Distribution. Six *Eutonina indicans* medusae were collected in the Homer Marina, Katchemak Bay, Cook Inlet on August 8, 1999.

Remarks. I am surprised that we did not find more of this species.

Gonionemus vertens

Distribution. More than 30 *Gonionemus vertens* medusae were seen in a dense eelgrass bed at low tide in front of Tatitlek, near the small town marina, on August 12, 1999.

Remarks. These medusae emerged from within blades of eelgrass in the low intertidal as the tide came in. They were abundant. The pigmentation was less colorful and more brownish than specimens in the San Juan Islands. This species was previously not known north of Sitka (where it is mentioned by Ricketts and Calvin, 1939), except that probably the same species (as *G. agassizii*) was collected early this century by Trevor Kincaid in a salt lake on Unalaska Island, in the Aleutians (Murbach and Shearer, 1903). The same or a very similar species also occurs in Japan and the Russian Far East.

Halitholus sp.

Distribution. Three *Halitholus* sp. medusae were collected at the Tatitlek commercial (ferry) dock on August 11, 1999, in vertical plankton tows taken off the side of the *Kristina* with Jeff Cordell's 130 µm mesh plankton net in about 50 feet of water. Two more of these medusae were seen using a flashlight, but not collected, later the same evening from the small Tatitlek town marina at about midnight.

Remarks. These 7-8 mm high specimens cannot be referred to any described species of *Halitholus*. They are very similar to both *Halitholus* sp. I and *Halitholus* sp. II of Arai and Brinckmann-Voss (1980, pp. 48-52), which were previously known from British Columbia and Washington State.

Leuckartiara sp.

Distribution. Four *Leuckartiara* sp. medusae were collected at the head of Sadie Cove, Katchemak Bay, on August 8, 1999, by dipping from a small boat in about 8 feet of water. All were below a layer of fresher water that occupied the upper 15" of the water column. Several others were seen, but not collected.

Remarks. These approximately 15 mm-high specimens cannot be referred to any described species of *Leuckartiara*. They bear some resemblance to *Leuckartiara foersteri* of Arai and Brinckmann-Voss (1980, pp. 52-53), which is known from British Columbia and Washington State. They had 8 large tentacles and 12 small tentacles, with no additional rudimentary marginal bulbs.

Melicertum octocostatum

Distribution. About ten *Melicertum octocostatum* medusae were found in the Homer Marina, Katchemak Bay, Cook Inlet, Fairmount Bay and the Cordova Marina.

Remarks. This species is well known elsewhere in Alaska as well as in the North Pacific and Atlantic; it probably occurs throughout Prince William Sound. These specimens were relatively small, all being under 12 mm in bell height.

Mitrocoma cellularia

Distribution. Homer Marina, Katchemak Bay, Cook Inlet on August 8, 1999.

Remarks. Only a single small (15 mm diameter) specimen was collected. This specimen was only provisionally identified as *M. cellularia* until it was compared with a comparable-sized living *M. cellularia* in Friday Harbor. The small and large tentacles on the margin are the same, confirming the species identification.

Obelia longissima (Pallas, 1766)

Distribution. Various sites in Prince William Sound, summer 1998.

Remarks. John Chapman sent all of the hydroids he collected in 1998 to Claudia Mills, who passed them on to Dr. Wim Vervoort of the Natural History Museum at Leiden, the Netherlands. Dr. Vervoort identified all of the hydroids that he saw as *Obelia longissima*. John Chapman has both the hydroids and their specific collection information.

Obelia? spp. hydroids

Distribution. These hydroids were collected at least at the Seward Marina and at Lowell Point on August 10 and 11, 1999.

Remarks. In my inexpert opinion, the blackened portions of some of the stems imply that these were probably *Obelia longissima*. I originally guessed that they might be *Garveia franciscana*, but they are not. They should be inspected by a hydroid specialist.

Proboscidactyla flavicirrata

Distribution. The hydroid of *P. flavicirrata* was found at the distal tips of several, 6 cm-long sabellid worm tubes in the Homer Marina, Katchemak Bay, Cook Inlet on August 8, 1999. This hydroid was actively producing medusa buds although no medusae were seen in this marina. Several *P. flavicirrata* medusae were collected in Fairmount Bay, Tatitlek and the Cordova Marina.

Remarks. These medusae are very small; they probably occur throughout Prince William Sound.

Sarsia/Coryne sp. hydroids

Distribution. One or more clumps of hydroids that looked like *Sarsia* were collected by Jeff Goddard in the Homer Marina, Katchemak Bay, Cook Inlet on August 8, 1999.

Remarks. I did not look carefully at this material. If it was reproductive and making medusa buds, it can be assigned to *Sarsia*; if it was reproductive and bearing fixed gonophores, it could be assigned to *Coryne*. *Sarsia* hydroids cannot usually be identified to species without their mature medusae.

Sarsia spp. medusae

Distribution. About ten *Sarsia* medusae were collected from Sadie Cove and the Homer Marina, (Kachemak Bay, Cook Inlet) and Fairmount Bay and Busby Island.

Remarks. *Sarsia* is a typical north-boreal hydrozoan genus. Many conspecific *Sarsias* are known from the Puget Sound / Strait of Georgia region and the entire life cycle - both hydroid and mature medusa - is usually needed for identification to species. Most of the medusae collected had the apical canal above the manubrium that is seen in *Sarsia princeps* and looked quite a bit like those pictured as *S. princeps* by Bigelow (1920), although they were rather small for that species. A second species seemed to also be present.

Staurophora mertensii

Distribution. This species (5 medusae) was collected by Bigelow (1913) in Prince William Sound - no further site description or date given.

Remarks. We did not find it in August 1999.

Tiaropsis multicirrata

Distribution. Several *Tiaropsis multicirrata* were collected at station PWS 98-21 on June 24, 1998. John Chapman identified this site as Green Island, near Montague Island, on the south side of Prince William Sound.

Remarks. Specimens sent to Claudia Mills for identification, summer 1998.

SCYPHOZOA

Aurelia labiata

Distribution. Only two *Aurelia labiata* were seen, in the Cordova Marina, on August 13, 1999.

Remarks. I would have expected to see this species or its northern congener *Aurelia limbata* (similar, but with a brown rim and tentacles) in many more locations. *Aurelia* tends to occur in dense aggregations at the surface - such "swarms" were described to me by resident kayakers as present in Sheep Bay near Cordova and at Long Bay off Culross Passage near Whittier, but we did not see them. See Wrobel and Mills (1998) for a discussion of the differences between *A. aurita* and *A. labiata*. Purcell (1998) refers to the Prince William Sound species as *A. aurita*, but probably without knowing about the recently rediscovered *A. labiata* name.

Cyanea capillata

Distribution. *Cyanea capillata* was probably the most common medusa in Prince William Sound in August 1999. We saw it in the Homer Marina and Sadie Cove in Cook Inlet, as well as at the Whittier Marina, en route at the south end of Esther Island and south of Eaglek Bay, in Fairmount Bay, at Tatitlek and in the Cordova Marina. A.J. Paul told me that it is common in Resurrection Bay, but further out than the town of Seward.

Remarks. In Prince William Sound this species comes in a range of colors, from red to pink or lilac, to yellowish, to a colorless "white". The size ranged from a couple of cm to about 30-40 cm in bell diameter. It was abundant in open water.

Unidentified scyphozoan polyps

Distribution. Jeff Goddard observed scyphistomae on the docks at both Homer and Whittier.

Remarks. Most scyphistomae on docks on the west coast have proven to be those of *Aurelia* spp. Other species of scyphozoan scyphistomae have not been observed in the field and I assume that they select other types of habitats. If these were *Aurelia*, they may have been either *Aurelia labiata* or perhaps *Aurelia limbata*, which is likely to also occur in the region.

CTENOPHORA

Bolinopsis infundibulum

Distribution. Only one *Bolinopsis* specimen was seen on the PWS 1999 trip. It was collected on August 11, 1999, at the Tatitlek commercial (ferry) dock, in vertical plankton tows taken off the side of the *Kristina* with Jeff Cordell's 130 µm mesh plankton net in about 50 feet of water.

Remarks. I do not hesitate to call this specimen *Bolinopsis infundibulum*, which I have also collected at Dutch Harbor.

Pleurobrachia bachei

Distribution. Only one *Pleurobrachia* specimen was seen on the PWS 1999 trip. It was collected on August 11, 1999, at the Tatitlek commercial (ferry) dock, in vertical plankton tows taken off the side of the *Kristina* with Jeff Cordell's 130 µm mesh plankton net in about 50 feet of water.

Remarks. Examination of this preserved ctenophore left some question about its species identity. This animal was fairly contracted in its preserved state, at which point the funnel canal appeared to be shorter than the pharynx, which is indicative of *Pleurobrachia pileus* (see Bigelow, 1912). This species name should not be applied lightly, however, to a North Pacific specimen, since all those collected from British Columbia to California have been identified as *Pleurobrachia bachei*. Comparison with 3 living *P. bachei* of the same size (about 7 mm) from Friday Harbor, revealed that the pharynx/canal ratios in that species to be similar to the preserved specimen from PWS, so that name is applied here.

MOLLUSCA

?*Clione limacina*

Distribution. A young pteropod collected in the Homer Marina (Cook Inlet) on August 8, 1999 was probably *Clione limacina*.

Remarks. The identification was not confirmed by careful microscopic examination. This species is found in boreal and temperate regions worldwide.

Melibe leonina

Distribution. Several *Melibe leonina* was observed either swimming in the water column or attached to kelp at each of: Fairmount Bay, Tatitlek and Cordova. In addition, Carmen Field

informed me that this species is common in Jakalof Bay within Katchemak Bay, although we did not confirm that location.

Remarks. This species was seen swimming well up in the water column at Fairmount Bay and over eelgrass at Tatitlek. It was attached to laminarian kelp in the marina at Cordova.

NONINDIGENOUS CNIDARIA, (MOST) ALREADY PRESENT IN SOME WEST COAST ESTUARIES

that might be positioned to ultimately invade locations in Alaska.

CNIDARIA

HYDROZOA

Bougainvillia muscus (Allman, 1863). Hydroid known on the west coast only from Friday Harbor, Washington (Mills, 1981, as *B. ramosa*); possibly the same species of *Bougainvillia* that is a pest/contaminant in some aquariums in California. Temperature tolerances not known. This may actually be a complex of cryptic species rather than one species (Calder, 1988).

Blackfordia virginica Mayer, 1910. Hydroids and medusae on the west coast known from north San Francisco Bay and Coos Bay (J. T. Carlton, personal communication); has a wide salinity and temperature tolerance. Also reported from the Chesapeake Bay and several European and Asian harbors, and its apparent point of origin, the Black Sea. Full temperature tolerances not known, but most of Alaska is north of its known distribution.

Cladonema radiatum Dujardin, 1843. Hydroids and tiny medusae abundant in eelgrass community in Padilla Bay, Washington, not far from Anacortes and Cherry Point oil terminals. Temperature tolerances not known, but this species is found in numerous locations worldwide, including northern and Mediterranean Europe, its putative natural range.

Cordylophora caspia (Pallas, 1771). Hydroid known from the mouth of the Samish River in Samish Bay, not far south of the Cherry Point oil terminals. Is also found in very low salinity tributaries to north San Francisco Bay and elsewhere on the west coast. Requires very low salinity, temperature tolerances not known; assumed to be of Ponto-Caspian origin.

Ectopleura crocea (L. Agassiz, 1862). This Atlantic hydroid is probably established in at least California and British Columbia (see photo attributed to this species in Harbo (1999, p. 32). Species of *Tubularia/Ectopleura* cannot be positively identified without examining the reproductive medusoids, which is rarely done by non-specialists.

Maeotias inexpectata Ostroumoff, 1896. Medusae on the west coast known from low salinity tributaries to north San Francisco Bay, seemingly always in salinities less than 15 psu, maybe to as low as 1-2 psu (Mills and Sommer, 1995). Also known intermittently from the Chesapeake Bay and several European estuaries, and its apparent point of origin, the Black Sea and Sea of Azov. Temperature tolerances not known, but most of Alaska is north of its known distribution. This species was newly collected in the Baltic Sea in Estonia in August 1999 (Risto Vainola, pers. comm.).

Moerisia spp. Several species in this genus have been described from a variety of widely separated locations worldwide, including some rivers emptying into north San Francisco Bay (J.T. Rees, personal communication), in which both polyps and medusae of this genus have been found. Also known from the Chesapeake Bay. It is not clear how many species are involved

worldwide. Some populations are known to be single-sexed, implying a single introduction. Temperature and salinity tolerances not known.

SCYPHOZOA

Aurelia aurita (Linnaeus, 1758). The most commonly-reported species of *Aurelia* worldwide. With its seemingly highly-transportable sessile polyp, there is some reason to assume that this species was carried early to many additional locations, although its home range is so-far not defined - genetic studies are currently underway by several researchers. All *Aurelia* that I have inspected carefully in Alaska appear to be *Aurelia labiata* Chamisso and Eysenhardt, 1821 or *Aurelia limbata* Brandt, 1835 (the latter species known from the Aleutians and the Bering Sea). *A. labiata* was originally described from central California, but seems to range all the way up the North American Pacific coast. It would not be too surprising to find *A. aurita* also living on the west coast. A report of a genetically-different population of *Aurelia* (Greenberg *et al.*, 1996) in San Francisco Bay is likely to be such. Because it is more amenable to culture, most public aquariums on the west coast have *Aurelia aurita* on display, providing a possible source of introduction. The name *Aurelia aurita* has been rather indiscriminately applied in the literature, including on the west coast of North America, without careful morphological inspection.

ANTHOZOA

Diadumene lineata Merrill, 1870. Cryptogenic sea anemone known from several locations in Washington and California, as well as worldwide. We searched in seemingly appropriate habitat for this species in several locations including the intertidal at Lowell Point, Seward, but none were found. Temperature tolerances are not known and might be an issue in Alaska.

Nematostella vectensis Stephenson, 1935. Cryptogenic sea anemone known from quiet, low-salinity lagoon habitats in most coastal American states, as well as numerous locations worldwide. This species was not found during the 1999 Prince William Sound Expedition, but we may not have encountered the right kind of habitat. Temperature tolerances are not known and might be an issue in Alaska.

CTENOPHORA

Mnemiopsis leidyi A. Agassiz, 1865. This is apparently the only species of ctenophore known to have invaded a marine habitat outside of its home range (the Black Sea). This genus, whose 3 putative species are not entirely resolved taxonomically, is native to the eastern coast of North America, extending from New England well into Argentina. It has not been found yet in the Pacific Ocean.

NOTE: Many ctenophores are assumed to have very broad global distributions, and it is not known at this time to what extent, if any, their ranges have been extended artificially by man.