

Deep-Sea Coral Taxa in the Alaska Region: Depth and Geographical Distribution (v. 2020)

Robert P. Stone¹ and Stephen D. Cairns²

1. NOAA Auke Bay Laboratories, Alaska Fisheries Science Center, Juneau, AK
2. National Museum of Natural History, Smithsonian Institution, Washington, DC

This annex to the Alaska regional chapter in “The State of Deep-Sea Coral Ecosystems of the United States” lists deep-sea coral species in the Phylum Cnidaria, Classes Anthozoa and Hydrozoa, known to occur in the U.S. Alaska region (Figure 1). Deep-sea corals are defined as azooxanthellate, heterotrophic coral species occurring in waters 50 meters deep or more. Details are provided on the vertical and geographic extent of each species (Table 1). This list is an update of the peer-reviewed 2017 list (Stone and Cairns 2017) and includes taxa recognized through 2020. Records are drawn from the published literature (including species descriptions) and from specimen collections that have been definitively identified by experts through examination of microscopic characters. Video records collected by the senior author have also been used if considered highly reliable; that is, in situ identifications were made based on an expertly identified voucher specimen collected nearby. Taxonomic names are generally those currently accepted in the World Register of Marine Species ([WoRMS](#)), and are arranged by order, and alphabetically within order by suborder (if applicable), family, genus, and species. Data sources (references) listed are those principally used to establish geographic and depth distribution, and are numbered accordingly.

In summary, we have confirmed the presence of 142 unique coral taxa in Alaskan waters, including three species of alcyonaceans described since our 2017 list. Octocorals were the most speciose (95 taxa total), followed by stylasterids (23 taxa), antipatharians (12 taxa), scleractinians (11 taxa), and one zoantharian coral. The Aleutian Islands region has the most taxa (n = 99), followed by the Gulf of Alaska Seamount Province (n = 47), the eastern Gulf of Alaska (n = 39), the western Gulf of Alaska (n = 24), and the Bering Sea (n = 20 taxa). Only a four soft corals and one unidentified sea pen are known from the Alaskan Arctic Region. Black corals (Order Antipatharia) were found over a depth range of 401-4685 m in the Alaska Region, scleractinians (Order Scleractinia) were found over a depth range of 17-6328 m, octocorals (Orders Alcyonacea and Pennatulacea) were found over a depth range of 3-4784 m, and stylasterids (Order Anthoathecata) had the narrowest depth range of 10-2124 m in the region.

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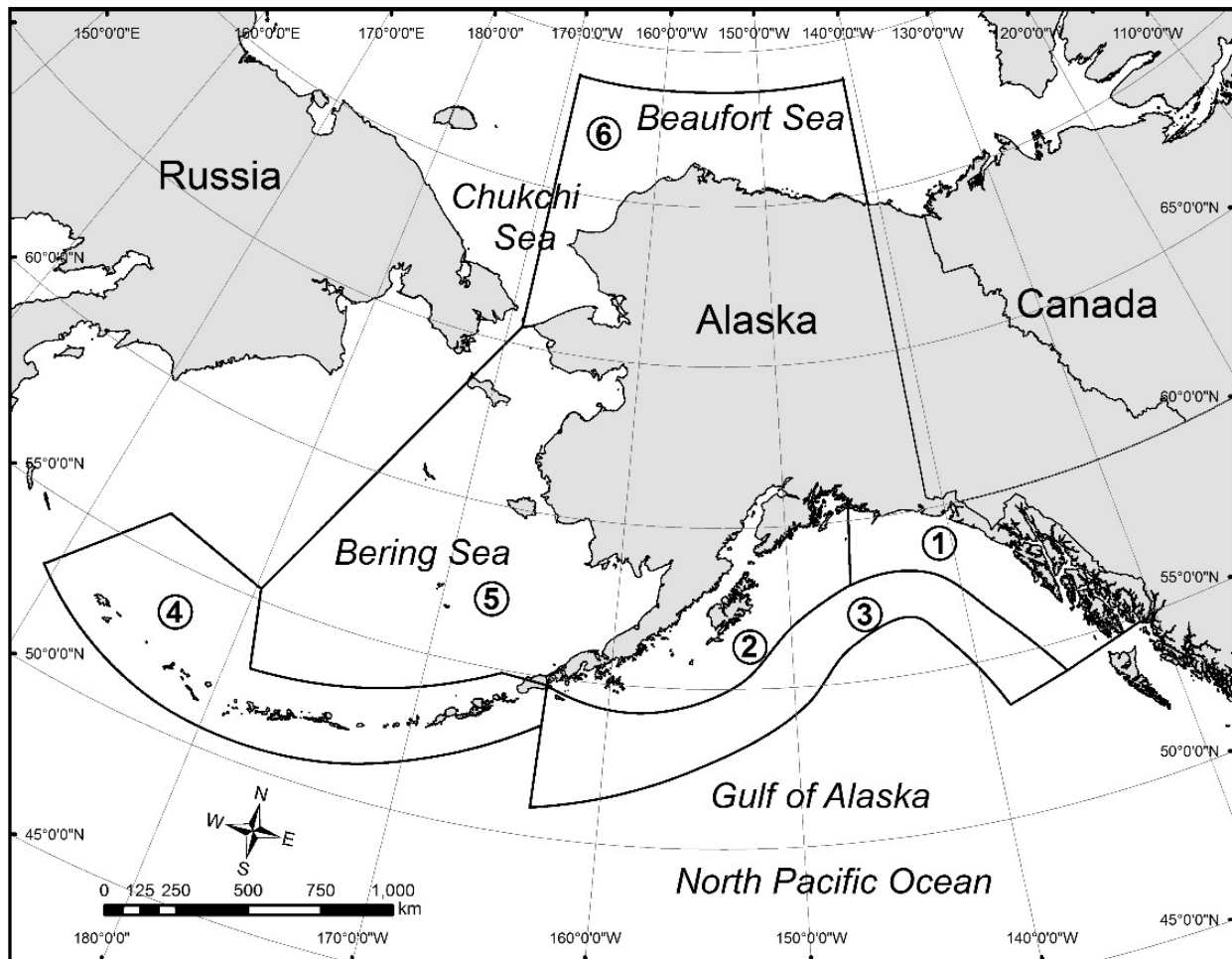


Figure 1. The U.S. Alaska region showing the five broad geographical areas that have previously been delineated for similar zoogeographical compilations (e.g., Stone and Shotwell, 2007) with the addition of a sixth area encompassing the Chukchi and Beaufort Seas. Region 1 = eastern Gulf of Alaska; Region 2 = western Gulf of Alaska; Region 3 = Gulf of Alaska Seamounts Province; Region 4 = Aleutian Islands; Region 5 = Bering Sea; and Region 6 = Arctic. Figure courtesy of Michele Masuda (NOAA Fisheries).

Table 1. List of known deep-sea coral species in Phylum Cnidaria, Class Anthozoa and Class Hydrozoa, and their reported distribution in the U.S. Alaska Region. Blue fields indicate newly described species since 2017. Bold text indicates these new descriptions as well as other changes to the list found in Stone and Cairns (2017), including additions or range extensions, denoted with an asterisk (*), and changes in taxonomy since 2017 denoted with a cross (†) (e.g., species that were listed in 2017, but have since been given a new name or alternative spelling). “NR” indicates a lack of reported distribution or depth information. References are numbered to correspond with citations following the table.

Distribution: 1 = eastern Gulf of Alaska; 2 = western Gulf of Alaska; 3 = Gulf of Alaska Seamounts Province; 4 = Aleutian Islands; 5 = Bering Sea; and 6 = Arctic region.

Higher Taxon	Species	Distribution	Depth Range (m)	References
Class Anthozoa				
Subclass Hexacorallia				
Order Antipatharia				
Family Cladopathidae	<i>Chrysopathes formosa</i> Opresko, 2003	1	417–800	1,2
	<i>Chrysopathes speciosa</i> Opresko, 2003	1	626–914	2,3
	<i>Heteropathes pacifica</i> (Opresko, 2005) (= <i>Heliopathes pacifica</i>)	3	3563–4511	4
	<i>Trissopathes pseudotristicha</i> (Opresko, 2003)	3,4	2828–4477	1,2
Family Schizopathidae	<i>Alternatipathes alternata</i> (Brook, 1889) (= <i>Bathypathes alternata</i>)	3	2818–4685	2
	<i>Bathypathes patula</i> Brook, 1889	1,3	401–4492	1,2
	<i>Bathypathes</i> sp. A	1,3	497–637	1
	<i>Bathypathes</i> sp. B	3,4	3274–4664	2
	<i>Dendrobathypathes boutillieri</i> Opresko, 2005	1,3,4	601–2161	1,5
	<i>Lillipathes wingi</i> Opresko, 2005	1,2,5	518–909	1,3
	†* <i>Parantipathes euantha</i> (Pasternak, 1958) (= <i>Parantipathes</i> sp. A <i>sensu</i> Stone & Cairns 2017)	1,4	690–1562	2,5
	<i>Parantipathes</i> sp. B	3	1907–2819	2
Order Scleractinia				
Family Caryophylliidae	<i>Caryophyllia</i> (<i>Caryophyllia</i>) <i>alaskensis</i> Vaughan, 1941	1,2,4,5	27–909	1,2
	<i>Caryophyllia</i> (<i>Caryophyllia</i>) <i>arnoldi</i> Vaughan, 1900	1,2,3,4	17–1702	1,2
	<i>Crispatotrochus foxi</i> (Durham & Barnard, 1952)	4	82–702	1,6
	<i>Desmophyllum dianthus</i> (Esper, 1794)	1	398	1
Family Dendrophylliidae	<i>Balanophyllia</i> (<i>Balanophyllia</i>) <i>elegans</i> Verrill, 1864	1,2,4	22–293	1,6

Higher Taxon	Species	Distribution	Depth Range (m)	References
Family Flabellidae	<i>Flabellum (Flabellum) sp. A sensu Cairns, 1994^a</i>	4	55–507	6,7
	<i>Javania borealis</i> Cairns, 1994	4	17–348	1,6
	<i>Javania cailleti</i> (Duchassaing & Michelotti, 1864)	4	115–150	1,2
Family Fungiacyathidae	<i>Fungiacyathus (Bathyactis) marenzelleri</i> (Vaughan, 1906) (includes <i>F. symmetricus aleuticus</i> Keller, 1976)	3,4	300–6328	2,6
	<i>Fungiacyathus sp.</i>	3	3274–4702	2
Family Micrabaciidae	<i>Leptopenus discus</i> Moseley, 1881	4	3599–5000	6
Order Zoantharia				
Family Parazoanthidae	<i>*Kulamanamana sp.</i> (= <i>Gerardia sp.</i>)	3	855–1119	2

Higher taxon	Species	Distribution	Depth Range (m)	References
Class Anthozoa				
Subclass Octocorallia				
Order Alcyonacea				
Family Acanthogorgiidae	<i>Acanthogorgia spissa</i> Kükenthal, 1909	4	1659–2087	5,8
	<i>Acanthogorgia sp.</i>	4	1092–1579	5
	<i>Calcigorgia beringi</i> (Nutting, 1912)	4 ^b	92–1913	5,9,10
	<i>Calcigorgia gigantea</i> Matsumoto, Ofwegen & Bayer, 2019	4	128–391	10
	<i>Calcigorgia matua</i> Dautova, 2018	4	300–900	10
	<i>Calcigorgia japonica</i> Dautova, 2007	4	395–2180	1,2,10
	<i>Calcigorgia spiculifera</i> Broch, 1935	1,2,4	18–512	5,11,10
Family Alcyoniidae	<i>Alcyonium sp.</i>	4,5,6	18–160	1,2,12
	<i>*Heteropolypus japonicus</i> (Nutting, 1912) (= <i>Anthomastus japonicus</i>)	4	424	2
	<i>*Heteropolypus ritteri</i> (Nutting, 1909)	4	241–427	2,12
	<i>Heteropolypus sp.</i>	1,3,4,5,6 ^c	85–2040	5,12
	<i>*Pseudoanthomastus sp.</i>	3	1285–1535	2
Family Anthothelidae	<i>Anthothela sp. cf. A. grandiflora</i> (M. Sars, 1856)	4	25–352	5,13
Family Chrysogorgiidae	<i>Chrysogorgia sp. B</i>	4	1359–2163	1,14
	<i>Chrysogorgia sp. C</i>	3	3385–4328	2
	<i>*Pseudochrysogorgia sp.^d</i>	3	1854–4167	2
	<i>Radicipes stonei</i> Cordeiro, Cairns & Pérez, 2017	3,4	1207–3580	2,5,15

Higher taxon	Species	Distribution	Depth Range (m)	References
Family Clavulariidae	<i>Clavularia armata</i> Thomson, 1927	3	2689–2730	2
	<i>Clavularia eburnea</i> Kükenthal, 1906	4	882	2
	<i>Clavularia rigida</i> Broch, 1935	3	3277	2
	<i>Clavularia</i> sp.	4,5	11–591	5,13
	<i>Sarcodictyon incrustans</i> (Broch, 1935)	1,4,5	15–388	1,2
	<i>Sarcodictyon</i> sp.	3	2811	2
Family Coralliidae	<i>Hemicorallium regale</i> (Bayer, 1956) (= <i>Corallium regale</i> Bayer, 1956)	3	1672–1806	2
Family Isididae ^e	<i>Bathygorgia profunda</i> Wright, 1885 (= <i>Keratoisis profunda</i>)	1,2,4	3230	2
	<i>Isidella tentaculum</i> Etnoyer, 2008	1,3,4,5	340–1468	2,5,16
	<i>Isidella</i> sp. A	4	2826	1
	<i>Isidella</i> sp. B	3	2652–4575	2
	<i>Isidella</i> sp. C	3	287–992	2
	<i>Keratoisis</i> sp. A	4,5	520–2031	1
	<i>Keratoisis</i> sp. B	4	1715–1717	1
	<i>Keratoisis</i> sp. C	4	1715	1
	<i>Keratoisis</i> sp. D	3	1096–1759	2
	<i>Keratoisis</i> sp. E	3	3574–4097	2
	<i>Lepidisis</i> sp. A	3	1130–1924	2
	<i>Lepidisis</i> sp. B	3	3501–4784	2
Family Nidaliidae	<i>Siphonogorgia</i> sp.	3	1094	2
Family Nephtheidae	<i>Gersemia fruticosa</i> Sars, 1860	2,4	1143	2
	* <i>Gersemia</i> sp. cf. <i>G. juliepackardae</i>	6	3–100	17
	<i>Gersemia rubiformis</i> (Ehrenberg, 1834) ^f (= <i>Eunepenthea rubiformis</i> ; <i>Alcyonium</i> sp. indet. sensu Williams, 2013)	1,2,4,5,6	3–90	2
	<i>Gersemia</i> sp. A (= <i>Eunepenthea</i> sp. A of Stone & Shotwell [2007])	4	804–2845	1
Family Paragorgiidae	† <i>Paragorgia pacifica</i> Verrill, 1922 ^g (= <i>Paragorgia arborea</i> forma <i>pacifica</i> (Linnaeus, 1758); <i>Paragorgia arborea</i> (Linnaeus, 1758) – in part – NE Pacific populations)	1,2,3,4,5	21–2022	2,5,18
	* <i>Paragorgia stephencairnsi</i> Sanchez, 2005	1,3	40–751	18
	<i>Sibogorgia cauliflora</i> Herrera, Baco & Sánchez, 2010	3	2766	2,19
Family Plexauridae	<i>Alaskagorgia aleutiana</i> Sánchez & Cairns, 2004	4	87–746	2,5,20
	<i>Alaskagorgia splendicitrina</i> Horvath & Stone, 2018	4	180	21
	<i>Cryogorgia koolsae</i> Williams, 2005	4	26–406	1,22

Higher taxon	Species	Distribution	Depth Range (m)	References
Family Plexauridae, cont.	<i>Muriceides cylindrica</i> Nutting, 1912	4	174–881	9
	<i>Muriceides nigra</i> Nutting, 1912	4	87–1195	1,5
	<i>Swiftia pacifica</i> (Nutting, 1912)	1,2,3,4,5	210–2779	1,2
	<i>Swiftia simplex</i> (Nutting, 1909) (= <i>Psammogorgia simplex</i> Nutting, 1909)	1,3,4	497–1285	1,2
	<i>Swiftia</i> sp. A	4	274–342	5
Family Primnoidae	* <i>Acanthoprímnoa</i> sp.	5	300	2
	† <i>Arthrogorgia kinoshitai</i> Bayer, 1952 (= <i>Arthrogorgia kinoshitae</i> Bayer, 1952)	4	150–1309	1,2,23
	<i>Arthrogorgia otsukai</i> Bayer, 1952	4	1332–1348	1,2
	<i>Arthrogorgia utinomii</i> Bayer, 1996	4	163–882	24
	† <i>Callogorgia compressa</i> (Verrill, 1865) (= <i>Fanellia compressa</i> (Verrill, 1865))	4	82–1341	1,23
	† <i>Callogorgia fraseri</i> (Hickson, 1915) (= <i>Fanellia fraseri</i> (Hickson, 1915))	2,4	54–1341	1,23
	<i>Calyptraphora laevispinosa</i> Cairns, 2007	3	1806–2795	2,23
	<i>Narella abyssalis</i> Cairns & Baco, 2007	3	4594	25
	<i>Narella alaskensis</i> Cairns & Baco, 2007	3	2254–3075	2,25
	<i>Narella arbuscula</i> Cairns & Baco, 2007	3	2775–3465	25
	<i>Narella bayeri</i> Cairns & Baco, 2007	3	3277–4091	25
	<i>Narella cristata</i> Cairns & Baco, 2007	3	3385	25
	<i>Parastenella doederleini</i> (Wright & Studer, 1889)	4	400–3423	23
	<i>Parastenella gymnogaster</i> Cairns, 2007	3	2417–2869	2
	<i>Parastenella ramosa</i> (Studer, 1894)	1,3,4	750–1937	2,26
	<i>Plumarella (Dicholaphis) aleutiana</i> Cairns, 2011	3,4,5	79–2828	1,23
	<i>Plumarella (Dicholaphis) echinata</i> Cairns, 2011	4	150–1692	23
	<i>Plumarella (Dicholaphis) hapala</i> Cairns, 2011	4	120–402	1,23
	<i>Plumarella (Dicholaphis) nuttingi</i> Cairns, 2011	4	492–888	23
	<i>Plumarella (Dicholaphis) profunda</i> Cairns, 2011	4	2514	23
	<i>Plumarella (Dicholaphis) robusta</i> Cairns, 2011	4	115–1061	1,23
	<i>Plumarella (Plumarella) spicata</i> Nutting, 1912	4	712–1912	23
	<i>Plumarella (Dicholaphis) superba</i> (Nutting, 1912) (= <i>Thouarella superba</i>)	4	40–1258	23
	<i>Primnoa pacifica</i> Kinoshita, 1907	1,2,4,5	6–573	1,23
	<i>Primnoa pacifica</i> var. <i>willeyi</i> Hickson, 1915	1,2,3,4	27–863	23
	<i>Primnoa wingi</i> Cairns & Bayer, 2005	4,5	110–1280	1,23
	<i>Thouarella cristata</i> Cairns, 2011	4	94–768	23
	<i>Thouarella trilineata</i> Cairns, 2011	4	97–1267	1,23

Higher taxon	Species	Distribution	Depth Range (m)	References
Order Pennatulacea^h				
Family Anthoptilidae	<i>Anthoptilum grandiflorum</i> (Verrill, 1879)	4,5	2153–2511	5
	<i>Anthoptilum murrayi</i> (Verrill, 1879)	4	1068–2226	2
Family Halipteridae ⁱ	<i>Halipteris californica</i> (Moroff, 1902)	1,2,4	178–1143	2,12
	<i>Halipteris willemoesi</i> Kölliker, 1870	1,2,4,5	21–488	27,28
	<i>Halipteris</i> sp. A	4,5	284–1381	5
	<i>Halipteris</i> sp. B	4	1667–2707	5
Family Pennatulidae	<i>Pennatula</i> sp.	4	2239–2930	5
	<i>Ptilosarcus gurneyi</i> (Gray, 1860)	1,2,4	3–195	1,5
Family Protoptilidae	<i>Protoptilum</i> sp.	1,2,5	105–529	24,29
Family Stachyptilidae	<i>Stachyptilum superbum</i> Studer, 1894	4	388	2
Family Umbellulidae	<i>Umbellula lindahli</i> Kölliker, 1875	1,2,3,4,5	840–4656	1,2
Family Veretillidae	<i>Cavernularia vansyoci</i> Williams, 2005	4	86–93	22
Family Virgulariidae	<i>Virgularia bromleyi</i> Kölliker, 1880	4	1889	2
	<i>Virgularia glacialis</i> Kölliker, 1870	4	122	2
	<i>Virgularia</i> sp.	1,2,4	20–187	1,2

Higher Taxon	Species	Distribution	Depth Range (m)	References
Class Hydrozoa				
Order Anthoathecata				
Family Stylasteridae ^j	<i>Cryptelia trophostega</i> Fisher, 1938	4,5	146–1913	30
	<i>Cyclohelia lamellata</i> Cairns, 1991	4,5 ^k	27–691	5,30
	<i>Distichopora borealis</i> Fisher, 1938	1,4	143–1361	5,30
	<i>Errinopora dichotoma</i> Cairns & Lindner, 2011	4	175–300	30
	<i>Errinopora disticha</i> Cairns & Lindner, 2011	4	175–536	30
	<i>Errinopora fisheri</i> Cairns & Lindner, 2011	4	455–458	30
	<i>Errinopora nanneca</i> Fisher, 1938	4	21–517	1,30
	<i>Errinopora undulata</i> Cairns & Lindner, 2011	4	350–640	30
	<i>Errinopora zarhyncha</i> Fisher, 1938	4	115–1520	1,5
	<i>Stylanthea papillosa</i> (Dall, 1884) (= <i>Stylanthea porphyra</i> , <i>S. petrograpta</i>)	1,2	11–18	30
	<i>Stylaster alaskanus</i> Fisher, 1938 (= <i>S. cancellatus</i>)	4	146–2124	5,30
	<i>Stylaster brochi</i> (Fisher, 1938)	1,2,4	22–374	1,30

Higher Taxon	Species	Distribution	Depth Range (m)	References
Family Stylasteridae, cont.	<i>Stylaster campylecus</i> (Fisher, 1938) (Includes: <i>Stylaster campylecus campylecus</i> , <i>S. polyorchis</i> , <i>S. c. tyloa</i> , <i>S. moseleyanaus</i>)	1,2,4	82–1260	5,30
	<i>Stylaster crassiseptum</i> Cairns & Lindner, 2011	4	291–531	30
	<i>Stylaster elassotomus</i> Fisher, 1938	4	882	30
	<i>Stylaster leptostylus</i> (Fisher, 1938)	4	518	30
	<i>Stylaster parageus columbiensis</i> Cairns & Lindner, 2011	1	92–212	1,30
	<i>Stylaster parageus parageus</i> (Fisher, 1938) (= <i>Stylaster campylecus parageus</i>)	1,2	26–401	1,30
	<i>Stylaster repandus</i> Cairns & Lindner, 2011	4	375–475	30
	<i>Stylaster stejnegeri</i> (Fisher, 1938)	4	87	30
	<i>Stylaster trachystomus</i> (Fisher, 1938)	4	115–366	30
	<i>Stylaster venustus</i> (Verrill, 1870)	1	20	1
	<i>Stylaster verrillii</i> (Dall, 1884) (= <i>S. moseleyi</i> f. <i>pacifica</i>)	1,4	10–393	1,30

Notes

- a. Cairns (1994) – *Flabellum* (*Flabellum*) sp. A. Several specimens in the National Museum of Natural History, including the specimen examined in Cairns (1994) are identified as: *Flabellum impensum* Squires, 1962 or *Flabellum* cf. *impensum*.
- b. Matsumoto et al. (2019) indicated that examined specimens of *Calciogorgia beringi* (Nutting, 1912) were limited to the Aleutian Islands. One unarchived specimen from the senior author from the eastern Gulf of Alaska may represent this species.
- c. A number of Anthomastinae corals, likely in the genus *Heteropolypus*, have been observed or collected from each Alaskan region. One individual identified as *Anthomastus* sp. was collected from the Alaskan Arctic region at 27 m in the Beaufort Sea (CAS 128958).
- d. *Pseudochrysoyorgia* sp. includes one specimen (USNM 1075801) previously identified as “*Chrysoyorgia* sp. A” of Stone & Cairns (2017).
- e. The Alaskan Isididae require further study. Specimens of *Keratoisis* sp. identified as *Keratoisis paucispinosa* (Wright & Studer, 1889) have been collected from Bowers Bank (CAS 18343) and off Baranof Island in the Gulf of Alaska (USNM 75055); one specimen identified as *Keratoisis profunda* (Wright, 1885) was collected from the Aleutian Islands (USNM 30076).
- f. Williams (2013) identified *Gersemia rubiformis* (Ehrenberg, 1834) as belonging in the family Alcyoniidae, genus *Alcyonium*. This change has not yet been reflected in WoRMS, and here we have retained *G. rubiformis*.
- g. Herrera & Shank (2016; ref. 18) resurrected the species *Paragorgia pacifica* Verrill, 1922 for the north Pacific populations of formerly *P. arborea*. Further work is required to determine whether all the Alaska specimens previously identified as *P. arborea*, which span a considerable geographic and depth range, are properly attributed to *Paragorgia pacifica*.
- h. One unidentified pennatulacean has been reported from the Alaskan Arctic region at 41 m in the Beaufort Sea (CAS 163188).
- i. Stone (2014) identified three putative *Halipterus* spp. from the central Aleutian Islands: *Halipterus willemoesi*, which occurred in relatively shallow water (1667–2707 m), *Halipterus* sp. B, which occurred in deep water

(1667–2707 m), and an unidentified species (*Halipterus* sp. A), possibly *H. californica*, that had a very broad depth range (284–1381 m).

- j. Stylasterids identified as *Stylaster* sp. were reported from deep water (1260–1327 m) in the central Aleutian Islands by the senior author and included in the [2017 species list](#) (see also Stone (2014), ref. 5). This listing has been removed from the current list pending further investigation of samples.
- k. Both Bering Sea records of *Cyclohelia lamellata* are based on single samples that were likely translocated by vessels fishing in the Aleutian Islands.

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