

Deep-Sea Coral Taxa in the Alaska Region: Depth and Geographical Distribution

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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 m deep or more. Details are provided on the vertical and geographic extent of each species (Table 1). This list is adapted from Stone and Shotwell (2007) and has been drawn from the published literature (including species descriptions) and from recent 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those principally used to establish geographic and depth distribution, and are numbered accordingly except for three unpublished reference collections as follows: **A)** the reference collection and video records of the senior author, **B)** specimen records archived at the United States National Museum of Natural History, Smithsonian Institution (2015), and **C)** S. Cairns (unpublished data).

In summary, we have confirmed the presence of 137 unique coral taxa in Alaskan waters. Octocorals were the most speciose (89 taxa total), followed by hydrocorals (24 taxa), antipatharians (12 taxa) and scleractinians (12 taxa). The Aleutian Islands region has the most taxa (n = 96), followed by the Gulf of Alaska Seamount Province (n = 42), the eastern Gulf of Alaska (n = 39), the western Gulf of Alaska (n = 24), and the Bering Sea (n = 18 taxa). Only a single coral species is known from the Arctic Region. Black corals (Order Antipatharia) were found over a depth range of 401-4685 m throughout 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 hydrocorals (Order Anthoathecata) had the narrowest depth range of 10-2124 m in the region.

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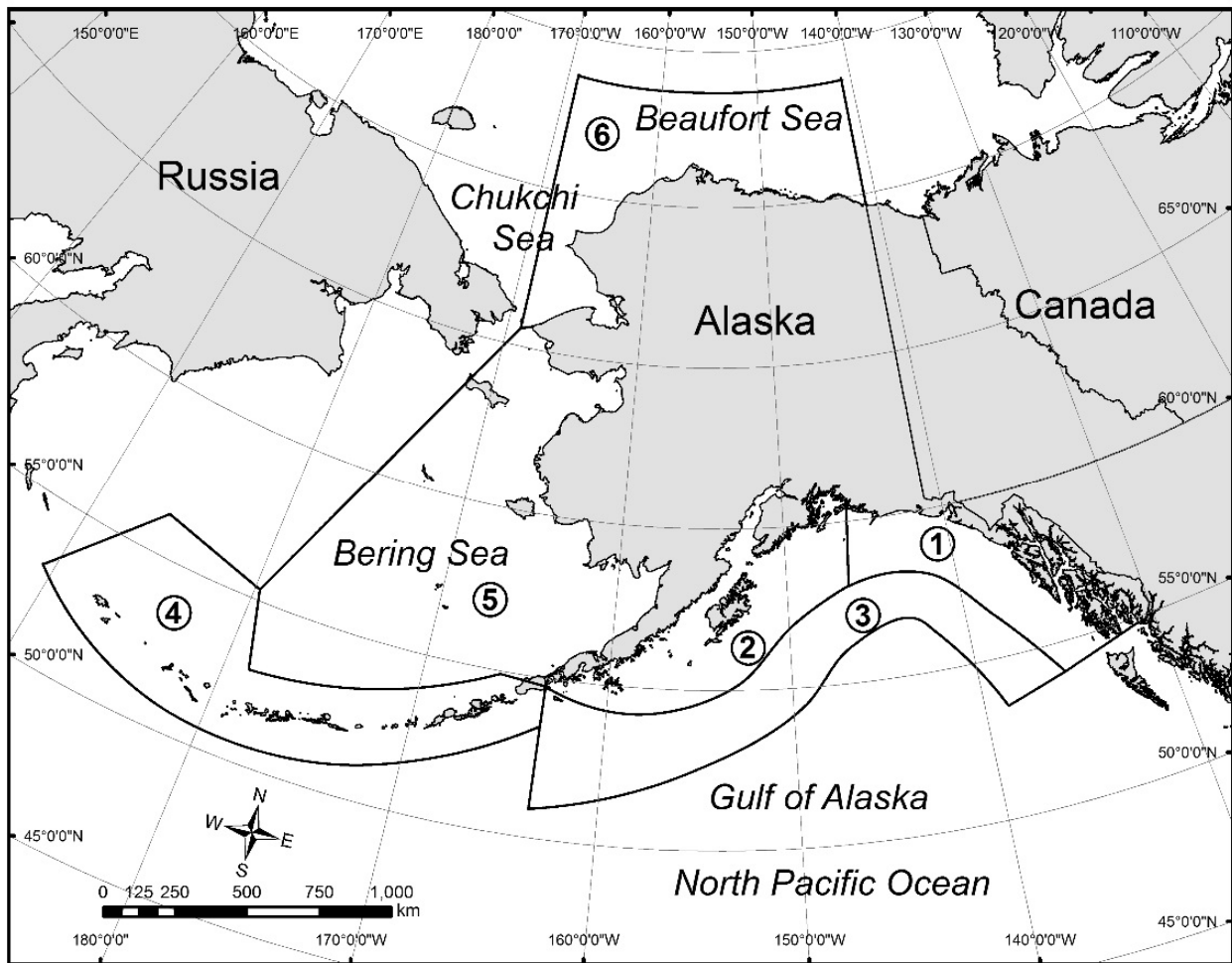


Figure 1. The U.S. Alaska region showing the five broad geographical areas that have previously been delineated for similar zoogeographical compilations (e.g., Stone and Shotwell, 2007) with the addition of a sixth area encompassing the Chukchi and Beaufort Seas. Region 1 = eastern Gulf of Alaska; Region 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 2007. Bold text indicates changes to the list found in Stone and Shotwell (2007), including additions or range extensions, denoted with an asterisk (*), and changes in taxonomy since 2007 denoted with a cross (†) (e.g., species that were listed in 2007, 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	A
	<i>Chrysopathes speciosa</i> Opresko, 2003	1	626–914	B,1
	† <i>Heteropathes pacifica</i> (Opresko, 2005) (= <i>Heliopathes pacifica</i>)	3	3563–4511	2
	<i>Trissopathes pseudotristicha</i> (Opresko, 2003)	3,4	2828–4477	A,B
Family Schizopathidae	† <i>Alternatipathes alternata</i> (Brook, 1889) (= <i>Bathypathes alternata</i>)	3 ⁱ	2818–4685	B
	<i>Bathypathes patula</i> Brook, 1889	1,3	401–4492	A,B
	<i>Bathypathes</i> sp. A	1,3	497–637	A
	<i>Bathypathes</i> sp. B	3,4	3274–4664	B
	<i>Dendrobathypathes boutillieri</i> Opresko, 2005	1,3,4	601–2161	A,3
	<i>Lillipathes wingi</i> Opresko, 2005	1,2,5	518–909	A,1
	<i>Parantipathes</i> sp. A	1,4 ⁱⁱ	690–1562	3
	* <i>Parantipathes</i> sp. B	3	1907–2819	B
Order Scleractinia				
Family Caryophylliidae	<i>Caryophyllia</i> (<i>Caryophyllia</i>) <i>alaskensis</i> Vaughan, 1941	1,2,4,5	27–909	A
	<i>Caryophyllia</i> (<i>Caryophyllia</i>) <i>arnoldi</i> Vaughan, 1900	1,2,3,4	17–1702	A,B
	<i>Crispatotrochus foxi</i> (Durham & Barnard, 1952)	4	82–702	A,4
	* <i>Desmophyllum dianthus</i> (Esper, 1794)	1	398	A
Family Dendrophylliidae	<i>Balanophyllia</i> (<i>Balanophyllia</i>) <i>elegans</i> Verrill, 1864	1,2,4	22–293	A,4
Family Flabellidae	† <i>Flabellum</i> sp. <i>sensu</i> Cairns, 1994 (= <i>Flabellum</i> sp.)	4	55–507	C,4
	<i>Javania borealis</i> Cairns, 1994	4 ⁱⁱⁱ	17–348	A,4
	<i>Javania cailleti</i> (Duchassaing & Michelotti, 1864)	4 ^{iv}	115–150	A
	* <i>Javania</i> sp.	3	1799	B
Family Fungiacyathidae	<i>Fungiacyathus marenzelleri</i> (Vaughan, 1906)	4	300–6328	4
	<i>Fungiacyathus</i> sp.	3	3274–4702	B
Family Micrabaciidae	<i>Leptopenus discus</i> Moseley, 1881	4	3599–5000	4

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	3,5
	<i>Acanthogorgia</i> sp.	4	1092–1579	3
	<i>Calcigorgia beringi</i> (Nutting, 1912)	1,4	92–1913	3,6
	<i>Calcigorgia japonica</i> Dautova, 2007	4	395–2180	A
	<i>Calcigorgia spiculifera</i> Broch, 1935	1,2,4	18–512	3,7
Family Alcyoniidae	<i>Alcyonium</i> sp.	4	18–160	A
	† <i>Heteropolypus</i> cf. <i>japonicus</i> (Nutting, 1912) (= <i>Anthomastus japonicus</i>)	4	424	B
	* <i>Heteropolypus</i> sp. (= <i>Anthomastus</i> sp.)	1,3,4,5	85–2040	3
Family Anthothelidae	<i>Anthothela</i> cf. <i>grandiflora</i> (M. Sars, 1856)	4	25–352	3,8
Family Chrysogorgiidae	<i>Chrysogorgia</i> sp. A	3	1854	B
	* <i>Chrysogorgia</i> sp. B	4	1359–2163	A
	* <i>Chrysogorgia</i> sp. C	3	3385–4328	B
	<i>Radicipes stonei</i> Cordeiro, Cairns & Pérez, 2017 (= <i>Radicipes verrilli</i> (Wright, 1885)) ^{vi}	3,4	1207–3580	B,3,9
Family Clavulariidae	<i>Clavularia armata</i> Thomson, 1927	3	2689–2730	B
	* <i>Clavularia eburnea</i> Kükenthal, 1906	4	882	B
	<i>Clavularia rigida</i> Broch, 1935	3	3277	B
	<i>Clavularia</i> sp.	4,5	11–591	3,8
	<i>Sarcodictyon incrustans</i> (Broch, 1935)	1,4,5	15–388	A
	<i>Sarcodictyon</i> sp.	3	2811	B
Family Coralliidae	† <i>Hemicorallium regale</i> Bayer, 1956 (= <i>Corallium</i> sp.)	3	1672–1806	B
Family Isididae	† <i>Bathygorgia profunda</i> (Wright, 1885) (= <i>Keratoisis profunda</i>)	1,2,4	3230	B
	<i>Isidella tentaculum</i> Etnoyer, 2008 (= <i>Isidella</i> sp. A)	1,3,4,5	340–1468	B,3,10
	<i>Isidella</i> sp. A	4	2826	A
	* <i>Isidella</i> sp. B	3	2652–4575	B
	* <i>Isidella</i> sp. C	3	287–992	B
	<i>Keratoisis</i> sp. A	4,5	520–2031	A
	<i>Keratoisis</i> sp. B	4	1715–1717	A
	* <i>Keratoisis</i> sp. C	4	1715	A
	† <i>Keratoisis</i> sp. D (= <i>Keratoisis</i> sp. B)	3	1096–1759	B
* <i>Keratoisis</i> sp. E	3	3574–4097	B	

Higher taxon	Species	Distribution	Depth Range (m)	References
Family Isididae, cont.	<i>Lepidisis</i> sp. A	3	1130–1924	B
	<i>Lepidisis</i> sp. B	3	3501–4784	B
Family Nidaliidae	* <i>Siphonogorgia</i> sp.	3	1094	B
Family Nephtheidae	* <i>Gersemia fruticosa</i> Sars, 1860	2,4	1143	B
	† <i>Gersemia rubiformis</i> (Ehrenberg, 1834) ^{vii} (= <i>Eunephthea rubiformis</i> ; <i>Alcyonium</i> sp. indet. sensu Williams 2013)	1,2,4,5,6	3–90	B
	† <i>Gersemia</i> sp. (= <i>Eunephthea</i> sp. A)	4	804–2845	A
Family Paragorgiidae	<i>Paragorgia arborea</i> (Linnaeus, 1758)	1,2,4,5	21–2022	B,3
	† <i>Paragorgia arborea forma pacifica</i> (Linnaeus, 1758) (= <i>Paragorgia pacifica</i>)	1,2	417–746	A
	<i>Paragorgia</i> sp.	3	718–1376	B
	<i>Sibogagorgia cauliflora</i> Herrera, Baco & Sánchez, 2010	3	2766	B,11
Family Plexauridae	<i>Alaskagorgia aleutiana</i> Sánchez & Cairns, 2004	4	91–614	3
	<i>Cryogorgia koolsae</i> Williams, 2005	4	26–406	A,12
	<i>Muriceides cylindrica</i> Nutting, 1912	4	174–881	6
	<i>Muriceides nigra</i> Nutting, 1912	4	87–1195	A,3
	<i>Swiftia pacifica</i> (Nutting, 1912)	1,2,3,4,5	210–2779	A,B
	<i>Swiftia simplex</i> (Nutting, 1909) (= <i>Psammogorgia simplex</i> Nutting, 1909)	1,3,4	497–1285	A,B
	† <i>Swiftia</i> sp. (= <i>Swiftia beringi</i>)	4	274–342	3
Family Primnoidae	<i>Arthrogorgia kinoshitae</i> Bayer, 1952	4 ^v	150–1309	A,13
	<i>Arthrogorgia otsukai</i> Bayer, 1952	4 ^{viii}	1332–1348	A
	<i>Arthrogorgia utinomii</i> Bayer, 1996	4	163–882	14
	<i>Calyptrophora laevispinosa</i> Cairns, 2007 (= <i>Calyptrophora japonica</i>)	3	1806–2795	B,13
	<i>Fanellia compressa</i> (Verrill, 1865)	4 ^{viii}	82–1341	A,13
	<i>Fanellia fraseri</i> (Hickson, 1915)	2,4	54–1341	A,13
	<i>Narella abyssalis</i> Cairns & Baco, 2007 (= <i>Narella</i> sp. A)	3	4594	15
	<i>Narella alaskensis</i> Cairns & Baco, 2007 (= <i>Narella</i> sp. B)	3	2254–3075	B,15
	<i>Narella arbuscula</i> Cairns & Baco, 2007 (= <i>Narella</i> sp. C)	3	2775–3465	15
	<i>Narella bayeri</i> Cairns & Baco, 2007 (= <i>Narella</i> sp. D)	3	3277–4091	15

Higher taxon	Species	Distribution	Depth Range (m)	References
Family Primnoidae, cont.	<i>Narella cristata</i> Cairns & Baco, 2007 (= <i>Narella</i> sp. E)	3	3385	15
	† <i>Parastenella doederleini</i> (Wright & Studer, 1889) (= <i>Parastenella</i> sp. B)	4 ⁱⁱ	400–3423	13
	<i>Parastenella gymnogaster</i> Cairns, 2007	3	2417–2869	B
	† <i>Parastenella ramosa</i> (Studer, 1894) (= <i>Parastenella</i> sp. A)	1,3,4	750–1937	B,16
	<i>Plumarella aleutiana</i> Cairns, 2011	3,4,5	79–2828	A,13
	<i>Plumarella echinata</i> Cairns, 2011	4	150–1692	13
	<i>Plumarella hapala</i> Cairns, 2011	4	120–402	A,13
	<i>Plumarella nuttingi</i> Cairns, 2011	4	492–888	13
	<i>Plumarella profunda</i> Cairns, 2011	4	2514	13
	<i>Plumarella robusta</i> Cairns, 2011	4	115–1061	A,13
	<i>Plumarella spicata</i> Nutting, 1912	4	712–1912	13
	† <i>Plumarella superba</i> (Nutting, 1912) (= <i>Thouarella superba</i>)	4	40–1258	13
	<i>Primnoa pacifica</i> Kinoshita, 1907	1,2,4,5	6–573	A
	<i>Primnoa pacifica</i> var. <i>willeyi</i> Hickson, 1915	1,2,3,4	27–863	13
	<i>Primnoa wingi</i> Cairns & Bayer, 2005	4,5	110–1280	A,13
	<i>Thouarella cristata</i> Cairns, 2011	4	94–768	13
<i>Thouarella trilineata</i> Cairns, 2011	4	97–1267	A,13	
Order Pennatulacea				
Family Anthoptilidae	<i>Anthoptilum grandiflorum</i> (Verrill, 1879)	4,5	2153–2511	3
	<i>Anthoptilum murrayi</i> (Verrill, 1879)	4 ^{viii}	1068–2226	B
Family Halipteridae	<i>Halipteris californica</i> (Moroff, 1902)	1,2	1143	B
	<i>Halipteris willemoesi</i> K�lliker, 1870	1,2,4,5	21–488	17,18
	* <i>Halipteris</i> sp. A	4,5	284–1381	3
	* <i>Halipteris</i> sp. B	4	1667–2707	3
Family Pennatulidae	* <i>Pennatula</i> sp.	4	2239–2930	3
	<i>Ptilosarcus gurneyi</i> (Gray, 1860)	1,2,4	3–195	A,3
Family Protoptilidae	<i>Protoptilum</i> sp.	1,2,5	105–529	14,19
Family Umbellulidae	<i>Umbellula lindahli</i> K�lliker, 1875	1,2,3,4,5	840–4656	A,B
Family Veretillidae	<i>Cavernularia vansyoci</i> Williams, 2005	4	86–93	12
Family Virgulariidae	* <i>Virgularia bromleyi</i> K�lliker, 1880	4	1889	B
	* <i>Virgularia glacialis</i> K�lliker, 1870	4	122	B
	<i>Virgularia</i> sp.	1,2,4	20–187	A,B

Higher taxon	Species	Distribution	Depth Range (m)	Reference(s)
Class Hydrozoa				
Order Anthoathecata				
Family Stylasteridae	<i>Crypthelia trophostega</i> Fisher, 1938	4,5 ^{viii}	146–1913	20
	<i>Cyclohelia lamellata</i> Cairns, 1991	4,5 ^{ix}	27–691	3,20
	<i>Distichopora borealis</i> Fisher, 1938	1,4	143–1361	3,20
	<i>Errinopora dichotoma</i> Lindner & Cairns, 2011	4	175–300	20
	<i>Errinopora disticha</i> Lindner & Cairns, 2011	4	175–536	20
	<i>Errinopora fisheri</i> Lindner & Cairns, 2011	4	455–458	20
	<i>Errinopora nanneca</i> Fisher, 1938	4	21–517	A,20
	<i>Errinopora undulata</i> Lindner & Cairns, 2011	4	350–640	20
	<i>Errinopora zarhyncha</i> Fisher, 1938	4	115–1520	A,3
	<i>Stylanthea papillosa</i> (Dall, 1884) (= <i>Stylanthea porphyra</i> , <i>S. petrograpta</i>)	1,2	11–18	20
	<i>Stylaster alaskanus</i> Fisher, 1938 (= <i>S. cancellatus</i>)	4	146–2124	3,20
	<i>Stylaster brochi</i> (Fisher, 1938)	1,2,4	22–374	A,20
	<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	3,20
	<i>Stylaster crassiseptum</i> Lindner & Cairns, 2011	4	291–531	20
	<i>Stylaster elassotomus</i> Fisher, 1938	4	882	20
	* <i>Stylaster leptostylus</i> (Fisher, 1938)	4	518	20
	<i>Stylaster parageus columbiensis</i> Lindner & Cairns, 2011	1	92–212	A
	† <i>Stylaster parageus parageus</i> (Fisher, 1938) (= <i>Stylaster campylecus parageus</i>)	1,2	26–401	A,20
	<i>Stylaster repandus</i> Lindner & Cairns, 2011	4	375–475	20
	* <i>Stylaster stejnegeri</i> (Fisher, 1938)	4	87	20
* <i>Stylaster trachystomus</i> (Fisher, 1938)	4	115–366	20	
<i>Stylaster</i> sp.	4	1260–1327	A	
<i>Stylaster venustus</i> (Verrill, 1870)	1	20	A	
<i>Stylaster verrillii</i> (Dall, 1884) (= <i>S. moseleyi</i> f. <i>pacifica</i>)	1,4	10–393	A,20	

Notes

- i. This species is reported from fewer specific localities than in 2007: it is no longer reported from region 1.
- ii. This species is reported from fewer specific localities than in 2007: it is no longer reported from region 3.
- iii. This species is reported from fewer specific localities than in 2007: it is no longer reported from regions 2 or 3.
- iv. This species is reported from fewer specific localities than in 2007: it is no longer reported from regions 1 or 2.
- v. This species is reported from fewer specific localities than in 2007: it is no longer reported from regions 1, 2, or 5.
- vi. This species was reported as *Radicipes verrilli* (Wright, 1885) by Stone & Shotwell (2007)
- vii. *Gersemia rubiformis* (Ehrenberg, 1834) was identified by Williams (2013) as belonging in the family Alcyoniidae, genus *Alcyonium*. This change has not yet been reflected in WoRMS, and here we have retained *G. rubiformis*.
Ref: Williams GC (2013) New taxa and revisionary systematics of alcyonacean octocorals from the Pacific coast of North America (Cnidaria, Anthozoa). ZooKeys:15-42.
- viii. This species is reported from fewer specific localities than in 2007: it is no longer reported from region 5.
- ix. Both records are based on single samples that were likely translocated by vessels fishing in the Aleutian Islands.

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