

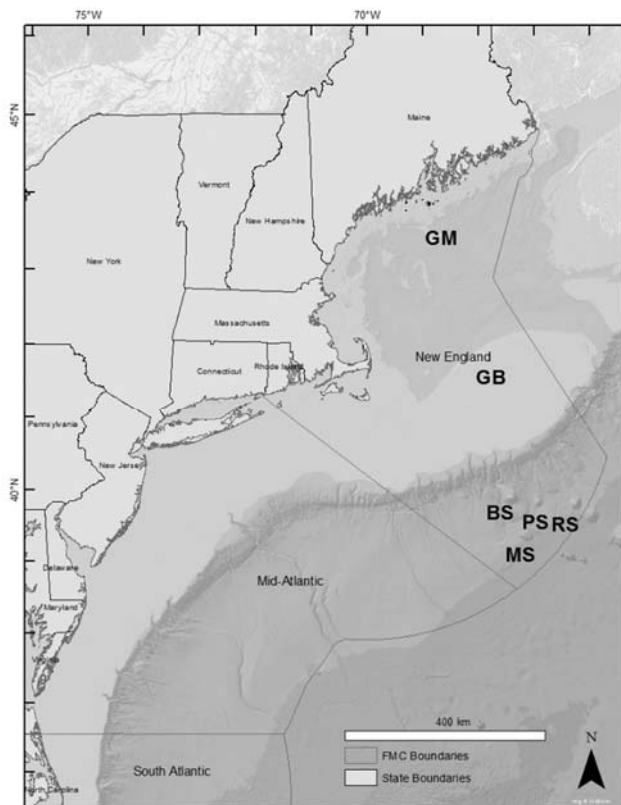
# Deep-Sea Coral Taxa in the U.S. Northeast Region: Depth and Geographical Distribution

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This annex to the U.S. Northeast chapter in “The State of Deep-Sea Coral and Sponge Ecosystems of the United States” provides a list of deep-sea coral taxa in the Phylum Cnidaria, Class Anthozoa, known to occur in U.S. waters from Maine to Cape Hatteras (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 Packer et al. (2007) with the addition of new species and range extensions into Northeast U.S. waters reported since 2007, along with a number of species previously not included. Details are provided on depth ranges and known geographic distribution within the region. Taxonomic names are generally those currently accepted in the World Register of Marine Species ([WoRMS](http://WoRMS)), and are arranged by order, then alphabetically by family, genus, and species. Data sources (references) listed are those principally used to establish geographic and depth distributions.

**Figure 1.** The U.S. Northeast region showing the following major geographic features: GM = Gulf of Maine; GB = Georges Bank; BS = Bear Seamount; PS = Physalia Seamount; RS = Retriever Seamount; and MS = Mytilus Seamount.



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**Table 1.** List of known deep-sea coral species in Phylum Cnidaria, Class Anthozoa, and their reported distributions in Northeast United States waters. Blue fields indicate newly described species since 2007. Bold text indicates changes to the list found in Packer et al. (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: NE = widespread in Northeast US waters; MA = off Massachusetts; RI = off Rhode Island; NY = off New York; NJ = off New Jersey; VA = off Virginia; NC = off North Carolina.

Habitat: C = Canyons; SH = Shelf; SL = Continental slope and rise; GM = Gulf of Maine; GB = Georges Bank; BS = Bear Seamount; PS = Physalia Seamount; RS = Retriever Seamount; MS = Mytilus Seamount. Additional information on the distribution of many species is found in Packer et al. (2007).

| Higher Taxon                 | Species   | Distribution   | Depth Range (m) | References            |
|------------------------------|---|----------------|-----------------|-----------------------|
| <b>Class Anthozoa</b>        |   |                |                 |                       |
| <b>Subclass Hexacorallia</b> |   |                |                 |                       |
| <b>Order Antipatharia</b>    |   |                |                 |                       |
| Family Antipathidae          | <i>*Stichopathes sp.<sup>a</sup></i>                                | VA(SL)         | 262             | 1                     |
| Family Leiopathidae          | <i>Leiopathes sp.</i>   | BS             | 1643, 1754      | 1,2                   |
| Family Schizopathidae        | <i>*Bathypathes spp.</i>  | NE(C,BS,RS,MS) | 1195-3262       | 3,4                   |
|                              | <i>*Parantipathes sp.</i>   | NE(C,BS,RS)    | 983-2045        | 1,3,4                 |
|                              | <i>*Stauropathes sp. 1</i>  | NE(C,MS)       | 1025-3262       | 4                     |
|                              | <i>Telopathes magna MacIsaac &amp; Best 2013</i>                    | NE(C,SL),BS,RS | 1073-1983       | 4,5,6                 |
| <b>Order Scleractinia</b>    |   |                |                 |                       |
| Family Caryophylliidae       | <i>Caryophyllia (Caryophyllia) ambrosia ambrosia</i> Alcock, 1898   | MA-NY(SL,BS)   | 1487-2286       | 1,7,8                 |
|                              | <i>Caryophyllia (Caryophyllia) ambrosia caribbeana</i> Cairns, 1979 | NY-NJ(C,SL)    | 1869-1975       | 1,7                   |
|                              | <i>Dasmosmilia lymani</i> (Pourtalès, 1871)                         | NE(C,SL)       | 37-700          | 6,7,9,10,11,12,13,14  |
|                              | <i>Desmophyllum dianthus</i> (Esper, 1794)                          | NE(C,SL,BS)    | 183-2250        | 4,6,7,8,9,10,15,16,17 |
|                              | <i>Lophelia pertusa</i> (Linnaeus, 1758)                            | NE(C,BS)       | 146-1300        | 4,6,7,8,9,15,16,18    |
|                              | <i>*Premocyathus cornuformis</i> (Portalès, 1868)                   | NE(SL,BS)      | 1098-2200       | 1                     |
|                              | <i>Solenosmilia variabilis</i> Duncan, 1873                         | NE(C,BS)       | 220-1383        | 4,6,7,9,10,19         |
|                              | <i>Vaughanella margaritata</i> (Jourdan, 1895)                      | BS             | 1100-1320       | 1,7,8                 |
| Family Deltocyathidae        | <i>Deltocyathus italicus</i> (Michelotti, 1838)                     | MA-NJ(SL,GM)   | 403-2634        | 7                     |
| Family Dendrophylliidae      | <i>Enallopsammia profunda</i> (Portalès, 1867)                      | GB(C)          | 1211-1748       | 1,7                   |
|                              | <i>Enallopsammia rostrata</i> (Portalès, 1878)                      | BS             | 300-1646        | 7,19                  |

| Higher Taxon           | Species  | Distribution    | Depth Range (m) | References              |
|------------------------|--|-----------------|-----------------|-------------------------|
| Family Flabellidae     | <i>Flabellum (Ulocyathus) alabastrum</i> Moseley, 1873   | NE(C,SL),GM, BS | 357-2500        | 6,7,8,9,10,11, 15,16,19 |
|                        | <i>Flabellum (Ulocyathus) angulare</i> Moseley, 1876     | NE(C,SL)        | 2266-3186       | 7,8,9,10,15, 16         |
|                        | <i>Flabellum (Ulocyathus) macandrewi</i> Gray, 1849      | NE(C,SL),GM     | 180-667         | 7,8,9,10,15, 16         |
|                        | <i>Javania cailleti</i> (Duchassaing & Michelotti, 1864) | NE(C)           | 30-1809         | 4,6,7,9,10              |
| Family Fungiacyathidae | <i>Fungiacyathus (Fungiacyathus) fragilis</i> Sars, 1872 | RI-NJ(C,SL)     | 412-460         | 7                       |
| Family Rhizangiidae    | <i>Astrangia poculata</i> (Ellis & Solander, 1786)       | MA-NC(SH)       | 0-263           | 7,20                    |

| Higher Taxon                 | Species  | Distribution                | Depth Range (m)       | References                    |
|------------------------------|--|-----------------------------|-----------------------|-------------------------------|
| <b>Class Anthozoa</b>        |  |                             |                       |                               |
| <b>Subclass Octocorallia</b> |  |                             |                       |                               |
| <b>Order Alcyonacea</b>      |  |                             |                       |                               |
| Family Acanthogorgiidae      | <i>Acanthogorgia armata</i> Verrill, 1878  | NE(C,GM)                    | 200-2500              | 1,4,15,16,17, 21,22,23,24, 25 |
|                              | <i>*Acanthogorgia aspera</i> Pourtalès, 1867   | Norfolk Canyon              | 422-1341              | 6                             |
| Family Alcyoniidae           | <i>Alcyonium digitatum</i> Linnaeus, 1758  | Canada-NJ(SH, GB,GM)        | 40-100                | 21,22                         |
|                              | <i>Anthomastus agassizii</i> Verrill, 1922   | NE(C,SL,BS)                 | 800-3186              | 8,10,12,15, 16,21,22,23, 26   |
|                              | <i>Anthomastus grandiflorus</i> Verrill, 1878  | NE(C,SL,BS)                 | 750-2637              | 15,16,21,22, 23               |
| Family Anthothelidae         | <i>Anthothela grandiflora</i> (Sars, 1856)   | NE(C,GM)                    | 200-2008              | 1,4,6,16,21, 22,23,25,27      |
|                              | <i>*Anthothela sp.</i>   | Baltimore & Norfolk Canyons | 474-594               | 27                            |
|                              | <i>*Lateothela grandiflora</i> (Tixier-Durivault & d'Hondt, 1974)<br>(= " <i>Alcyonium</i> " <i>grandiflorum</i> Tixier-Durivault & d'Hondt, 1974) | Norfolk Canyon              | 474-480               | 27                            |
| Family Chrysogorgiidae       | <i>Chrysogorgia agassizii</i> (Verrill, 1883)  | Canada-NJ(SL)               | 1928-3186             | 10,21,22                      |
|                              | <i>Chrysogorgia tricaulis</i> Pante and Watling, 2011  | BS, RS                      | BS: 1559;<br>RS: 3860 | 3,28                          |
|                              | <i>Iridogorgia pourtalesii</i> Verrill, 1883   | Unverified                  | 594-1633              | 21,22                         |

| Higher Taxon                  | Species   | Distribution      | Depth Range (m)                      | References                                  |
|-------------------------------|---|-------------------|--------------------------------------|---|
| Family Chrysogorgiidae, cont. | <b>*<i>Metallogorgia melanotrichos</i> (Wright and Studer, 1889)</b>  | BS,PS,RS, NE(C)   | BS: 1491, 1559, 1639; RS: 1983, 2012 | 3,4,22,29                                   |
|                               | <i>Radicipes gracilis</i> (Verrill, 1884)   | BS,NE(C,SL)       | 1431-1650                            | 3,4,19,21,22                                |
| Family Clavulariidae          | <i>Clavularia modesta</i> (Verrill, 1874)   | GM                | 30-125                               | 1,21,22                                     |
|                               | <i>Clavularia rudis</i> (Verrill, 1922)   | NE(C)             | 750-1610                             | 4,15,16,21, 22,23                           |
| Family Coralliidae            | <b><i>Hemicorallium cf. bathyrubrum</i> (Simpson &amp; Watling, 2011)</b><br>(= <i>Corallium cf. bathyrubrum</i> Simpson & Watling, 2011) | MS                | 2600-3270                            | 4   |
| Family Gorgoniidae            | <b>*<i>Leptogorgia virgulata</i> (Lamarck, 1815)<sup>b</sup></b>  | NY-NC(SH)         | 2-59                                 | 1,30,31                                     |
| Family Isididae               | <i>Acanella arbuscula</i> (Johnson, 1862)<br>(= <i>Acanella eburnea</i> (Pourtales, 1868))  | RS,NE(C,SL)       | 411-3236                             | 1,3,4,6,10,11, 12,15,16,20, 21,22,23,32, 33 |
|                               | <b><i>Acanella scarletae</i> Saucier &amp; France, 2017</b>   | Norfolk Canyon    | 1670-1694                            | 34  |
|                               | <b><i>Jasonisis</i> sp.</b>   | MS,NE(C)          | 700-3000 (approx.)                   | 4   |
|                               | <i>Keratoisis grayi</i> Wright, 1869  | NE(C,SL),BS       | 320-3236                             | 19,21,22                                    |
|                               | <i>Lepidisis caryophyllia</i> Verrill, 1883   | NE                | 646-3316                             | 4,8,21,22                                   |
| Family Nephtheidae            | † <b><i>Drifa glomerata</i> Verrill, 1869</b><br>(= <i>Capnella glomerata</i> (Verrill, 1869))  | Lydonia Canyon    | 200-561                              | 16,21,22,23                                 |
|                               | † <b><i>Duva florida</i> (Rathke, 1806)</b><br>(= <i>Capnella florida</i> ; <i>Alcyonium multiflorum</i> )                                | Canada-VA(C,SL)   | 350-1500                             | 6,11,12,15,16, 19,20,21                     |
|                               | <i>Gersemia fruticosa</i> (Sars, 1860)  | NE(C,SL)          | 600-3100                             | 15 21,23                                    |
|                               | <i>Gersemia rubiformis</i> (Ehrenberg, 1834)  | MA(SH,GM), VA(SH) | 48-227                               | 21,22                                       |
| Family Paragorgiidae          | <i>Paragorgia arborea</i> (Linnaeus, 1758)  | NE(C),GM          | 300-1100                             | 4,6,8,15,16, 20,21,22,23, 35,36             |
|                               | <b>*<i>Paragorgia johnsoni</i> Gray, 1862</b>   | BS                | 1428-1650                            | 33  |
| Family Plexauridae            | <b>*<i>Paramuricea biscaya</i> Grasshoff, 1977</b>  | BS,RS,NE(C)       | 1218-2155                            | 22,37                                       |
|                               | <i>Paramuricea grandis</i> Verrill, 1883  | GM.NE(C)          | 400-2200                             | 3,10,15,16, 21,22,23,26, 37                 |
|                               | <b>*<i>Paramuricea cf. grayi</i> (Johnson, 1861)</b>  | GM                | 220-1353                             | 37  |
|                               | <i>Paramuricea placomus</i> (Linnaeus, 1758)  | NE(C),GM          | 220-517                              | 6,21,22,24, 25,37                           |
|                               | <i>Swiftia casta</i> (Verrill, 1883)  | GB(SL)            | 1836-2233                            | 8,21,22                                     |
|                               | <b>*<i>Swiftia pallida</i> Madsen, 1970</b>   | BS,NE(C)          | 580-1794                             | 1,4,33                                      |

| Higher Taxon                            | Species   | Distribution        | Depth Range (m)         | References   |
|---|---|---------------------|-------------------------|--|
| Family Primnoidae                       | <i>*Calyptrophora antilla</i> Bayer, 2001   | BS                  | 1684                    | 1,22,38  |
|   | <i>*Convexella cf. jungersenii</i> (Madsen, 1944)   | MS                  | 2592-3271               | 4  |
|   | <i>Narella laxa</i> Deichmann, 1936   | GB(SL)              | 3186                    | 1,21,22,39   |
|   | <i>Paranarella watlingi</i> Cairns, 2007  | MS,RS               | 3855                    | 4,22,38  |
|   | <i>Parastenella atlantica</i> Cairns, 2007  | RS                  | 1984                    | 22,38  |
|   | <i>Primnoa resedaeformis</i> (Gunnerus, 1763)   | NE(C),GM            | 91-548                  | 4,6,8,10,15,<br>16,20,21,22,<br>23,24,25,26,<br>35,40,41 |
|   | <i>Thouarella (Euthouarella) grasshoffi</i> Cairns, 2006  | NE(C),BS            | 720-1760                | 4,21,22,38,42  |
| <b>Order Pennatulacea</b>               |   |                     |                         |  |
| Family Anthoptilidae                    | <i>Anthoptilum grandiflorum</i> (Verrill, 1879)<br>(= <i>Benthoptilum sertum</i> Verrill 1885 (in part))            | NE(SL)              | 559-3316                | 1,15,23  |
|   | <i>Anthoptilum murrayi</i> K lliker, 1880   | NE(SL)              | 314, 1538 -<br>2387     | 1  |
| Family Funiculinidae                    | <i>*Funiculina armata</i> Verrill, 1879   | Canada-NJ(SL)       | 1538-2601               | 1  |
| Family Halipteridae                     | † <i>Halipteris finmarchica</i> (Sars, 1851)<br>(= <i>Balticina finmarchica</i> )                                   | Canada-<br>MA(SL)   | 229-2249                | 1,15,20,23   |
| Family Kophobelemnidae                  | † <i>Kophobelemnon stelliferum</i> (M ller, 1776)<br>(= <i>Kophobelemnon scabrum</i> ; <i>Kophobelemnon tenue</i> ) | NE(SL)              | 393-2199,<br>2491-4332  | 1,4,10,16,23,<br>32                                      |
| Family Pennatulidae                     | <i>Pennatula aculeata</i> Danielssen, 1860<br>(= <i>Pennatula borealis</i> M. Sars, 1846)                           | NE(SH,GM,<br>SL),BS | 119-3316                | 1,10,15,16,19,<br>23                                     |
|   | <i>Pennatula grandis</i> Ehrenberg, 1834  | NE(SL)              | 1850-2140               | 1,10   |
| Family Protoptilidae                    | <i>Distichoptilum gracile</i> Verrill, 1882   | NE(SL,C)            | 600-2844                | 1,4,10,11,12,<br>16,23                                   |
|   | <i>Protoptilum carpenteri</i> K lliker, 1872<br>(= <i>Protoptilum aberrans</i> K lliker 1880)                       | NE(SL)              | 1334-2359               | 1  |
| Family Scleroptilidae                   | † <i>Scleroptilum grandiflorum</i> K lliker, 1880<br>(= <i>Scleroptilum gracile</i> Verrill 1884)                   | NE(SL)              | 1502-4332               | 1  |
| Family Umbellulidae<br>(= Ombellulidae) | † <i>Umbellula guentheri</i> K lliker, 1880<br>(= <i>Umbellula guntheri</i> )                                       | NJ-VA(SL)           | 2683-3740               | 1  |
|   | <i>Umbellula lindahli</i> K lliker, 1875  | NE(SL)              | 549-3338                | 1  |
| Family Virgulariidae                    | <i>Stylatula elegans</i> (Danielssen, 1860)   | NY-<br>NC(SH,C,SL)  | 20-440                  | 1,10,13,14,<br>16,23                                     |
|   | <i>*Virgularia sp.</i>  | NJ-DE(SH)           | 65-91, 360-<br>410, 942 | 1  |

## Notes

- a. Specimen previously identified as *Cirrhopathes* sp. and included as such in Packer et al. 2007, was been subsequently identified as *Stichopathes* sp. (likely *Stichopathes gravieri* Molodtsova, 2006 – D. Opresko, pers. comm.).
- b. *Leptogorgia virgulata* is primarily a shallow-water species with nearly all specimens recorded at depths less than 50 m.

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