

Literature sources

Global gradients in intertidal species richness and functional groups

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The following literature was used in the extracting process of intertidal species richness data:

Ahmad, O., Fang, T.P. & Yahya, K. (2011) Distribution of Intertidal Organisms in the Shores of Teluk Aling, Pulau Pinang, Malaysia. *Publications pf the Set Marine Biological Laboratory*, **41**, 51–61.

Alaska Ocean Observing System (AOOS; aoos.org)

Archambault, P. & Bourget, E. (1996) Scales of coastal heterogeneity and benthic intertidal species richness, diversity and abundance. *Marine Ecology Progress Series*, **136**, 111–121.

Arribas, L.P., Gutiérrez, J.L., Bagur, M., Soria, S.A., Penchaszadeh, P.E. & Palomo, M.G. (2019) Variation in aggregate descriptors of rocky shore communities: a test of synchrony across spatial scales. *Marine Biology*, **166**, 44.

Barnes, D.K., Linse, K., Waller, C. Morely, S., Enderlein, P., Fraser, K.P. & Brown, M. (2006) Shallow benthic fauna communities of South Georgia Island. *Polar Biology*, **29**, 223–228.

Barnes, D.K., Kaiser, S., Griffiths, H.J. & Linse, K. (2009) Marine, intertidal, freshwater and terrestrial biodiversity of an isolated polar archipelago. *Journal of Biogeography*, **36**, 756–769.

Batham, E.J. (1956) Ecology of southern New Zealand sheltered rocky shore. In *Transactions of the Royal Society of New Zealand*, **84**, 447–465.

Bellisio, N.B., Lopez, R.B. & Tomo, A.P. (1972) Vertical distribution of benthic fauna in

- three Antarctic localities: Hope Bay, Peterman Island and Melchior Archipelago. *Contribuciones Instituto Antártico Argentino*, **142**, 23–115.
- Bick, A. & Arlt, G. (2013) Description of intertidal macro-and meiobenthic assemblages in Maxwell Bay, King George Island, South Shetland Islands, Southern Ocean. *Polar biology*, **36**, 673–689.
- Blankley, W.O. & Branch, G.M. (1985) Ecology of the limpet *Nacella delesserti* (Philippi) at Marion Island in the sub-antarctic Southern Ocean. *Journal of experimental marine biology and ecology*, **92**, 259–281
- Blanchard, D. & Bourget, E. (1999) Scales of coastal heterogeneity: influence on intertidal community structure. *Marine Ecology Progress Series*, **179**, 163–173.
- Blanchette, C.A., Miner, C.M., Raimondi, P.T., Lohse, D., Heady, K.E.K. & Broitman, B.R. (2008) Biogeographical patterns of rocky intertidal communities along the Pacific coast of North America. *Journal of Biogeography*, **35**, 1593–1607.
- Brattegård, T. (1966) The natural history of the Hardangerfjord 7. Horizontal distribution of the fauna of rocky shores. *Sarsia*, **22**, 1–54.
- Breese, W.P., Millemann, R.E. & Roland, E.D. (1963) Stimulation of Spawning in the Mussels, *Mytilus edulis* Linnaeus and *Mytilus californianus* Conrad, by Kraft Mill Effluent. *Biological Bulletin*, **125**, 197–205.
- Breves-Ramos, A., Lavrado, H.P., Junqueira, A. de O.R. & Silva, S.H.G. da (2005) Succession in rocky intertidal benthic communities in areas with different pollution levels at Guanabara Bay (RJ-Brazil). *Brazilian Archives of Biology and Technology*, **48**, 951–965.
- Brewin P, Wells E, Volonterio O, Brickle P (2011) Intertidal assemblages of South Georgia. Report for the South Georgia heritage trust and joint nature conservation committee, shallow marine surveys group, survey.
- Bulleri, F. & Chapman, M.G. (2004) Intertidal assemblages on artificial and natural habitats in marinas on the north-west coast of Italy. *Marine Biology*, **145**, 381–391.
- Burrows, M., Harvey, R. & Robb, L. (2008) Wave exposure indices from digital coastlines and the prediction of rocky shore community structure. *Marine Ecology Progress Series*, **353**, 1–12.
- Bustamante, R.H. (1994) Patterns and causes of intertidal community structure around the coast of southern Africa. PhD Thesis.
- Bustamante, R.H. & Branch, G.M. (1996) Large Scale Patterns and Trophic Structure of Southern African Rocky Shores: The Roles of Geographic Variation and Wave Exposure. *Journal of Biogeography*, **23**, 339–351.
- Castellanos, Z.D. & Luna Perez, J.C. (1963) Algunos aspectos bioecológicos de la zona intercotidal de Cabo Primavera (Costa de Danco, Península Antártica). *Contribución del Instituto Antártico Argentino*. 072, 24.
- Castilla, J.C. & Rozbaczylo, N. (1985) Rocky intertidal assemblages and predation on the gastropod *Nacella (Patinigera) concinna* at Robert Island, South Shetlands

- Antarctica. *Instituto Antártico Chileno Serie Científica*, 32, 65–73.
- Cattaneo-Vietti, R., Chiantore, M., Schiaparelli, S. & Albertelli, G. (2000) Shallow-and deep-water mollusc distribution at Terra Nova Bay (Ross Sea, Antarctica). *Polar Biology*, 23, 173–182.
- Cecil, W., Olsen, K., Shrimpton, S., Wimpee, L., Leischner, J. & Osborne-Koch, M. (2004) *Intertidal zonation - does species diversity decrease with tidal height?* Biology 474/574 report.
- Chamberlain, Y., Holdgatem M.W. & Wace, N. (1985). The littoral ecology of Gough Island, South Atlantic Ocean. *Tethys*, 11, 302–319.
- Coates, M. (1998) A comparison of intertidal assemblages on exposed and sheltered tropical and temperate rocky shores. *Global Ecology and Biogeography Letters*, 7, 115–124.
- Cruz-Motta, J.J., Miloslavich, P., Palomo, G., Iken, K., Konar, B., Pohle, G., Trott, T., Benedetti-Cecchi, L., Herrera, C., Hernández, A., Sardi, A., Bueno, A., Castillo, J., Klein, E., Guerra-Castro, E., Gobin, J., Gómez, D.I., Riosmena-Rodríguez, R., Mead, A., Bigatti, G., Knowlton, A. & Shirayama, Y. (2010) Patterns of spatial variation of assemblages associated with intertidal rocky shores: a global perspective. *PLoS ONE*, 5, e14354.
- Davenport, J. & MacAlister, H. (1996) Environmental conditions and physiological tolerances of intertidal fauna in relation to shore zonation at Husvik, South Georgia. *Journal of the Marine Biological Association of the United Kingdom*, 76, 985–1002.
- De Villiers, A.F. (1976) Littoral ecology of Marion and Prince Edward Islands (Southern Ocean). *South African Journal of Antarctic Research*. (Suppl.) 1: 1–4
- Edgar, G.J. & Burton, H.R. (2000) The biogeography of shallow-water macrofauna at Heard Island. *Papers and Proceedings of the Royal Society of Tasmania*, 133, pp. 23–26.
- Edgar, G.J. (1984) General features of the ecology and biogeography of Tasmanian subtidal rocky shore communities. In *Papers and proceedings of the Royal Society of Tasmania*, 118, 173–18.
- Espinosa, F. & Guerra-García, J.M. (2005) Algae, macrofaunal assemblages and temperature: a quantitative approach to intertidal ecosystems of Iceland. *Helgoland Marine Research*, 59, 273–285.
- Good, T.P. (2004) Distribution and abundance patterns in Caribbean rocky intertidal zones. *Bulletin of marine science*, 74, 459–468.
- Griffiths, H.J. & Waller, C.L. (2016) The first comprehensive description of the biodiversity and biogeography of Antarctic and Sub-Antarctic intertidal communities. *Journal of Biogeography*, 43, 1143–1155.
- Grua, P. (1971) Invertebres De L'Infralittoral Rocheux dans L'Archipel de Kerguelen. *Comite National Français des Recherches Antarctiques*, 30, 1–63
- Guiler, E.R. (1952) The nature of intertidal zonation in Tasmania. In *Papers and*

- Proceedings of the Royal Society of Tasmania*, **86**, 31–62.
- Guiler, E.R. (1952) The ecological features of certain sheltered intertidal areas in Tasmania. In *Papers and Proceedings of the Royal Society of Tasmania*, **86**, 1–12.
- Guiler, E.R. (1950) The intertidal ecology of Pipe Clay lagoon. In *Papers and Proceedings of the Royal Society of Tasmania*. pp. 29–52.
- Hansen, J., Hanken, N.M., Nielsen, J.K., Nielsen, J.K. & Thomsen, E. (2011) Late Pleistocene and Holocene distribution of *Mytilus edulis* in the Barents Sea region and its palaeoclimatic implications. *Journal of Biogeography*, **38**, 1197–1212.
- Hayward, B.W. & Morley, M.S. (2004) *Intertidal life around the coast of the Waitakere Ranges, Auckland*.
- Heaven, C.S. & Scrosati, R.A. (2008) Benthic community composition across gradients of intertidal elevation, wave exposure, and ice scour in Atlantic Canada. *Marine Ecology Progress Series*, **369**, 13–23.
- Hedgpeth, J.W. (1969) Preliminary Observations of Life Between Tidemarks at Palmer Station, 64 degrees 45, S 64 Degrees 05, W. *Antarctic Journal of the United States*, **4**, 106.
- Høgslund, S., Sejr, M.K., Wiktor, J., Blicher, M.E. & Wegeberg, S. (2014) Intertidal community composition along rocky shores in South-west Greenland: a quantitative approach. *Polar Biology*, **37**, 1549–1561.
- Ibanez-Erquiaga, B., Pacheco, A.S., Rivadeneira, M.M. & Tejada, C.L. (2018) Biogeographical zonation of rocky intertidal communities along the coast of Peru (3.5–13.5° S Southeast Pacific). *PLOS ONE*, **13**, e0208244.
- Jazdzewski, K., Broyer, C., Pudlarz, M. & Zielinski, D. (2001) Seasonal fluctuations of vagile benthos in the uppermost sublittoral of a maritime Antarctic fjord. *Polar Biology*, **24**, 910–917.
- Kedra, M., Włodarska-Kowalcuk, M. & Weslawski, J.M. (2010) Decadal change in macrobenthic soft-bottom community structure in a high Arctic fjord (Kongsfjorden, Svalbard). *Polar Biology*, **33**, 1–11.
- Kenny, R. & Haysom, N. (1962) Ecology of rocky shore organisms at Macquarie Island. *Pacific Science*, **16**, 245–263.
- Kotta, J., Orav-Kotta, H., Jänes, H., Hummel, H., Arvanitidis, C., Van Avesaath, P., Bachelet, G., Benedetti-Cecchi, L., Bojanic, N., Como, S., Coppa, S., Coughlan, J., Crowe, T., Dal Bello, M., Degraer, S., De La Pena, J.A.J., Fernandes De Matos, V.K., Espinosa, F., Faulwetter, S., Frost, M., Guinda, X., Jankowska, E., Jourde, J., Kerckhof, F., Lavesque, N., Leclerc, J.-C., Magni, P., Pavloudi, C., Pedrotti, M.L., Peleg, O., Pérez-Ruzafa, A., Puente, A., Ribeiro, P., Rilov, G., Rousou, M., Ruginis, T., Silva, T., Simon, N., Sousa-Pinto, I., Troncoso, J., Warzocha, J. & Weslawski, J.M. (2017) Essence of the patterns of cover and richness of intertidal hard bottom communities: a pan-European study. *Journal of the Marine Biological Association of the United Kingdom*, **97**, 525–538.
- Kuklinski, P. & Barnes, D.K.A. (2008) Structure of intertidal and subtidal assemblages

- in Arctic vs temperate boulder shores. *Polish Polar Research*, **39**, 203–218.
- Lawrence, J.M. & McClintock, J.B. (1987) Intertidal invertebrate and algal communities on the rocky shores of the Bay of Morbihan, Kerguelen (South Indian Ocean). *Marine Ecology*, **8**, 207–220.
- Lee, A.C., Tan, K.S. & Sin, T.M. (2009) Intertidal assemblages on coastal defence structures in Singapore I: A faunal study. *The raffles bulletin of zoology Supplement*, **22**, 237–254.
- Lee, T.H. & Li, M.H. (2013) Intertidal assemblages on artificial structures and natural rocky habitats on Taiwan's North Coast. *Raffles Bulletin of Zoology*, **61**, 331–342.
- Lubchenco, J., Menge, B.A., Garrity, S.D., Lubchenco, P.J., Ashkenas, L.R., Gaines, S.D., Emlet, R., Lucas, J. & Strauss, S. (1984) Structure, persistence, and role of consumers in a tropical rocky intertidal community (Taboguilla Island, Bay of Panama). *Journal of Experimental Marine Biology and Ecology*, **78**, 23–73.
- Marine.ucsc.edu (2019) Long-Term Monitoring Surveys | MARINe. [online] Available at <https://marine.ucsc.edu/methods/longterm-methods.html>.
- McGuinness, K.A. (1990) Physical variability, diversity gradients and the ecology of temperate and tropical reefs. *Australian Journal of Ecology*, **15**, 465–476.
- Merder, J., Freund, J.A., Meysick, L., Simkanin, C., O'Riordan, R.M. & Power, A.M. (2018) East-west spatial groupings in intertidal communities, environmental drivers and key species. *Journal of the Marine Biological Association of the United Kingdom*, **98**, 423–435.
- Musetta-Lambert, J.L., Scrosati, R., Keppel, E.A., Barbeau, M.A., Skinner, M.A. & Courtenay, S.C. (2015) Intertidal communities differ between breakwaters and natural rocky areas on ice-scoured Northwest Atlantic coasts. *Marine Ecology Progress Series*, **539**, 19–31.
- Müller, D.B., Schoeman, F.R. & Van Zinderen Bakker Sr., E.M. (1967) Some notes on a biological reconnaissance of Bouvetøya (Antarctic). *South African Journal of Science*. **63**, 260–263.
- Naumov, A. (2001) *Benthos. White Sea: Ecology and Environment* (eds. V.Berger and S. Dahle), pp. 41–55. Derzhavets Publishers, St.Petersburg — Tromsø.
- Newcombe, E.M. & Cárdenas, C.A. (2011) Rocky reef benthic assemblages in the Magellan Strait and the South Shetland Islands (Antarctica). *Revista de Biología Marina y Oceanografía*, **46**, 177–188.
- Okuda, T., Noda, T., Yamamoto, T., Ito, N. & Nakaoka, M. (2004) Latitudinal gradient of species diversity: multi-scale variability in rocky intertidal sessile assemblages along the Northwestern Pacific coast. *Population Ecology*, **46**, 159–170.
- OBIS (2019). Data from the Ocean Biogeographic Information System. Intergovernmental Oceanographic Commission of UNESCO.
- Ocean Biogeographic Information System: the South American Research Group on Coastal Ecosystems (SARCE)

- Piló, D., Barbosa, A.B., Teodósio, M.A., Encarnação, J., Leitão, F., Range, P., Krug, L.A., Cruz, J. & Chicharo, L. (2018) Are submarine groundwater discharges affecting the structure and physiological status of rocky intertidal communities? *Marine Environmental Research*, **136**, 158–173.
- Power, M.E., Tilman, D., Estes, J.A., Menge, B.A., Bond, W.J., Mills, L.S., Daily, G., Castilla, J.C., Lubchenco, J. & Paine, R.T. (1996) Challenges in the Quest for Keystones: Identifying keystone species is difficult—but essential to understanding how loss of species will affect ecosystems. *Bioscience*, **46**, 609–620.
- Pugh, P.J.A. & Davenport, J. (1997) Colonisation vs. disturbance: the effects of sustained ice-scouring on intertidal communities. *Journal of Experimental Marine Biology and Ecology*, **210**, 1–21.
- Ralph, P.M., Yaldwyn, J.C. (1956) Sea floor animals from Otago Harbour. Department of Zoology, Victoria University College.
- Reports of the Australasian Antarctic Expedition 1911-1914.
- Reports of the British Australian (and) New Zealand Antarctic Research Expedition (BANZARE) 1929-1931.
- Reports of the Belgian Antarctic Expedition (BelgAE) 1897-1899.
- Reports of the French Antarctic Expedition 1903-05.
- Reports of the French Antarctic Expedition 1908-10.
- Reports of the Norwegian Antarctic Expedition 1927-28.
- Reports of the Norwegian Scientific Expedition to Tristan da Cunha 1937-38.
- Reports of the Scottish National Antarctic Expedition 1902–1904.
- Reports of the Swedish South Pole Expedition 1901-1903.
- Reports and field notes of Operation Tabarin. Accessed through the British Antarctic Survey Archives department.
- Ríos, C. & Mutschke, E. (1999) Community structure of intertidal boulder-cobble fields in the Straits of Magellan, Chile. *Scientia Marina*, **63**(S1), 193–201.
- Robertson, B.P. & Stevens, L.M. (2016) *Flat Point 2016 Fine Scale Rocky Shore Monitoring*. Report
- Rullier, F. (1971) Invertébrés De L’Infralittoral Rocheux dans L’Archipel de Kerguelen. *Comité National Français des Recherches Antarctiques*, **30**, 1-44.

- Scrosati, R. & Heaven, C. (2007) Spatial trends in community richness, diversity, and evenness across rocky intertidal environmental stress gradients in eastern Canada. *Marine Ecology Progress Series*, **342**, 1–14.
- Scrosati, R.A., Knox, A.S., Valdivia, N. & Molis, M. (2011) Species richness and diversity across rocky intertidal elevation gradients in Helgoland: testing predictions from an environmental stress model. *Helgoland Marine Research*, **65**, 91–102.
- Sejr, M.K., Mouritsen, K.N., Krause-Jensen, D., Olesen, B., Blicher, M.E. & Thyrring, J. (2021) Small scale factors modify impacts of temperature, ice scour and waves and drive rocky intertidal community structure in a Greenland fjord. *Frontiers in Marine Science*, **7**, 607135.
- Simkanin, C., Power, A.M., Myers, A., McGrath, D., Southward, A., Mieszkowska, N., Leaper, R. & O'Riordan, R. (2005) Using historical data to detect temporal changes in the abundances of intertidal species on Irish shores. *Journal of the Marine Biological Association of the UK*, **85**, 1329.
- Simpson, R.D. (1976) The shore environment of Macquarie Island. Australian Government Publishing Service.
- Smith, J.M.B & Simpson, R.D. (1985) Biotic zonation on rocky shores of Heard Island. *Polar Biology*, **4**, 89–94.
- Smith, T.B., John, P. & John, F. (2007) The rocky intertidal biota of the Florida Keys: fifty-two years of change after Stephenson and Stephenson (1950). *Bulletin of Marine Science*, **80**, 1–19.
- Smithsonian National Museum of Natural History: Antarctic Invertebrates (2015) Accessed via <http://invertebrates.si.edu/antiz/> on 2015-04-01.
- Sorte, C.J.B., Davidson, V.E., Franklin, M.C., Benes, K.M., Doellman, M.M., Etter, R.J., Hannigan, R.E., Lubchenco, J. & Menge, B.A. (2017) Long-term declines in an intertidal foundation species parallel shifts in community composition. *Global Change Biology*, **23**, 341–352.
- Stevens, L. & Robertson, B. (2012) Waipapa Point Fine Scale Rocky Shore Monitoring. Prepared for Environment Southland.
- Stevens, L. & Robertson, B. (2012) Stirling Point Fine Scale Rocky Shore Monitoring. Prepared for Environment Southland.
- Stockton, W.L. (1973) Intertidal assemblages at Palmer Station. *Antarctic Journal of the United States*, **8**, 305–307.
- Stout, W.E. & Shabica, S.V. (1970) Marine ecological studies at palmer-station and vicinity. *Antarctic Journal of the United States*, **5**, 134.
- Thomas, M.L.H. (1985) Littoral community structure and zonation on the rocky shores of Bermuda. *Bulletin of marine science*, **37**, 857–870.
- Thyrring, J. (2019) Intertidal data from Young Sound fjord, NW Greenland (unpublished data).

- Thyrring, J., Wegeberg, S., Blicher, M.E., Krause-Jensen, D., Høgslund, S., Olesen, B., Wiktor Jr., J., Mouritsen, K.N., Peck, L.S. & Sejr, M.K. (2021) Latitudinal patterns in intertidal ecosystem structure in West Greenland suggest resilience to climate change. *bioRxiv*, 419028.
- Udalov, A.A., Vedenin, A.A. & Simakov, M.I. (2016) Benthic fauna of Blagopoluchiya Bay (Novaya Zemlya Archipelago, Kara Sea). *Oceanology*, **56**, 655–665.
- Underwood, A.J. (1981) Structure of a rocky intertidal community in New South Wales: Patterns of vertical distribution and seasonal changes. *Journal of Experimental Marine Biology and Ecology*, **51**, 57–85.
- Valdivia, N., Díaz, M.J., Holtheuer, J., Garrido, I., Huovinen, P. & Gomez, I. (2014) Up, Down, and All Around: Scale-Dependent Spatial Variation in Rocky-Shore Communities of Fildes Peninsula, King George Island, Antarctica. *PLOS One*, **9**.
- Valdivia, N., Segovia-Rivera, V., Fica, E., Bonta, C.C., Aguilera, M.A. & Broitman, B.R. (2017) Context-dependent functional dispersion across similar ranges of trait space covered by intertidal rocky shore communities. *Ecology and Evolution*, **7**, 1882–1891.
- Waller, C.L. (2008) Variability in intertidal communities along a latitudinal gradient in the Southern Ocean. *Polar Biology*, **31**, 809–816.
- Waller, C.L., Barnes, D.K. & Convey, P. (2006) Ecological contrasts across an Antarctic land-sea interface. *Austral Ecology*, **31**, 656–666.
- Waller, C.L. (2013) Zonation in a cryptic Antarctic intertidal macrofaunal community. *Antarctic Science*, **25**, 62–68.
- Watt, C.A. & Scrosati, R.A. (2013) Bioengineer effects on understory species richness, diversity, and composition change along an environmental stress gradient: Experimental and mensurative evidence. *Estuarine, Coastal and Shelf Science*, **123**, 10–18.
- Węsławski, J.M., Wiktor Jr., J. & Kotwicki, L. (2010) Increase in biodiversity in the arctic rocky littoral, Sorkapland, Svalbard, after 20 years of climate warming. *Marine Biodiversity*, **40**, 123–130.
- Węsławski, J.M., Wiktor, J., Zajaczkowski, M., Futsaeter, G. & Moe, K.A. (1997a) Vulnerability assessment of Svalbard intertidal zone for oil spills. *Estuarine Coastal and Shelf Science*, **44**, 33–41.
- Węsławski, J.M., Wiktor, J., Zajaczkowski, M. & Swerpel, S. (1993) Intertidal zone of svalbard: Macroorganism distribution and biomass. *Polar Biology*, **13**, 73–79.
- Węsławski, J.M. & Zajaczkowski, M. (1992) *Benthic fauna and its environment in Tikhaya Bay, Hooker Island*, Norsk Polarinstitutt Meddelser, Oslo, Norway.
- Węsławski, J.M., Zajaczkowski, M., Wiktor, J. & Szymelfenig, M. (1997b) Intertidal zone of Svalbard 3. Littoral of a subarctic, oceanic island: Bjornoya. *Polar Biology*, **18**, 45–52.
- Wells, E., Brewin, P. & Brickle, P. (2011) Intertidal and subtidal benthic seaweed

diversity of South Georgia. Report for the South Georgia heritage trust and joint nature conservation committee, shallow marine surveys group, survey.

Zacharias, M.A. & Roff, J.C. (2001) Explanations of patterns of intertidal diversity at regional scales. *Journal of Biogeography*, **28**, 471–483.

Zamprogno, G.C., Fernandes, F.C. & Fernandes, L.L. (2012) Temporal and spatial variation of rocky shores intertidal benthic communities in Southeast Brazil. *Iheringia Série Zoologia*, **102**, 375–383.

Zinderen Bakker, E.V., Winterbottom, J.M. & Dyer, R.A. (1971) Marion and Prince Edward islands: *Report on the South African Biological & Geological Expedition 1965-1966*.

Zinsmeister, W.J. (1976) Intertidal region and molluscan fauna of Seymour Island, Antarctic Peninsula. *Antarctic Journal of the United States*, **11**, 222–225.

Zwerschke, N., Bollen, M., Molis, M. & Scrosati, R. (2013) An environmental stress model correctly predicts unimodal trends in overall species richness and diversity along intertidal elevation gradients. *Helgoland Marine Research*, **67**, 663–674.