

New marine species in New Zealand – an institutional snapshot

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A press release [<http://www.marinespecies.org/news.php?p=show&id=4099>] issued on 12 March 2015 by the World Register of Marine Species in Ostend, Belgium, made the following announcement:

The World Register of Marine Species (WoRMS) confirms that currently 228,450 marine animal and plant species are known ... every day new species are discovered and described. In 2014 alone, some 1,451 new-to-science marine creatures were added to WoRMS — an average of four per day. WoRMS editors have contracted to 228,450 [after accounting for synonyms] the number of species currently known to science. About 195,000 (86%) of them are animals, including just over 18,000 species of fish described since the mid-1700s, more than 1,800 sea stars, 816 squids, 93 whales and dolphins and 8,900 clams and other bivalves. The rest are species of kelp, seaweeds and other plants, bacteria, viruses, fungi and single cell organisms. Based at the Flanders Marine Institute (VLIZ) in Belgium, WoRMS is a collaborative scientific triumph. It is used worldwide as the authoritative taxonomic reference list of all marine species.

To coincide with the above, NIWA prepared a local press release giving some related statistics based on the work of NIWA marine taxonomists and extramural collaborators. It was written by one of the handful of New Zealand WoRMS editors (the author of this article), who was invited to contribute an account for *New Zealand Science Review*.

NIWA has a large, ~60-year-old collection of marine invertebrates, inherited from the former New Zealand Oceanographic Institute of the Department of Scientific and Industrial Research (DSIR). This nationally important research collection underpins the work of biological oceanographers and marine ecologists studying food webs and benthic assemblages in the New Zealand

Exclusive Economic Zone. Examples of some recently identified endemic species are shown in Figures 1–9.

NIWA marine taxonomists studying invertebrates, aided by visiting scientists from overseas, annually publish papers and monographs describing new taxa. NIWA's phycologists additionally study marine macroalgae and phytoplankton and describe new taxa. The NIWA press release read as follows:

NIWA biologists have discovered 141 new marine creatures in the past three years, an important contribution to a worldwide register of the planet's underwater life. The World Register of Marine Species (WoRMS), published in Ostend,

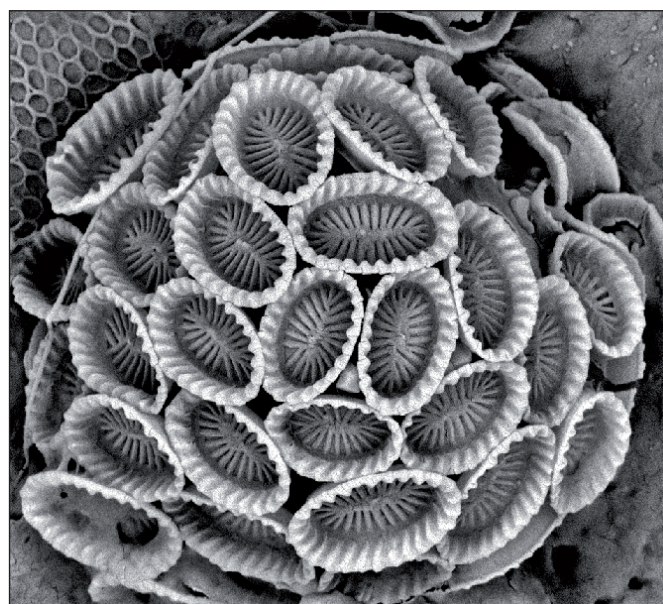
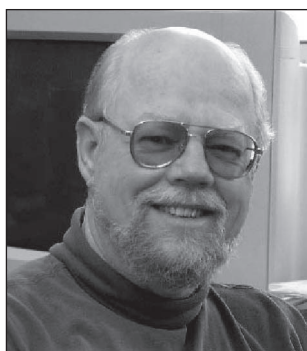


Figure 1. *Syracosphaera pemmadiscus* Chang, 2013, an ultra-tiny member of a group of microalgae called coccolithophores, newly named from New Zealand plankton. Coccolithophores are calcareous algae that are regarded as sentinels of ocean acidification.

Photo: Hoe Chang, NIWA

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Dennis Gordon is a Principal Scientist and Group Manager for Marine Biodiversity and Biosecurity at the Wellington campus of the National Institute of Water & Atmospheric Research. His major research interest is the systematics, biology and phylogeny of Cretaceous to Recent Bryozoa. Beyond this group, Dennis has an interest in all of life and has served on the international teams that coordinate the production of the Catalogue of Life and the World Register of Marine Species. He is a past chairman of the Royal Society Committee on Biodiversity and was a member of the New Zealand Association of Scientists Council from 1997 to 2009. In 2005 he was the recipient of the New Zealand Marine Sciences Society Award for his lifetime contribution to the advancement of marine science in New Zealand.



Figure 2. *Narella hypocalyx* Cairns, 2012, a primnoid gorgonian octocoral from 800 m on Aloha Seamount, Chatham Rise.
 Photo: Dave Allen, NIWA

Belgium, has almost completed logging all the world's known marine species. The list relies on contributions from marine biologists around the world—including in New Zealand. More than 1000 new-to-science marine fish species have been described globally since 2008—an average of more than 10 per month—according to the scientists completing the consolidated inventory of all known ocean life. Among new fish species worldwide are 122 new sharks and rays, 131 new members of the goby family, and a new barracuda found in the Mediterranean.

A recent NIWA-led inventory of New Zealand's marine species [Gordon 2009, 2010, 2012, 2013] counted close

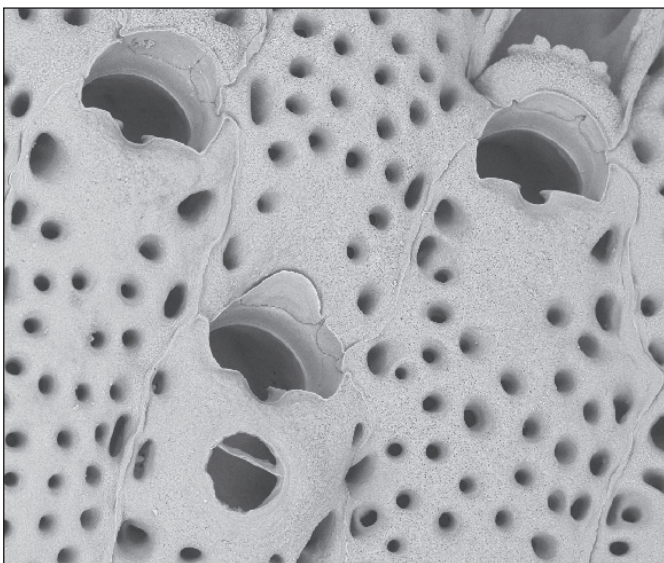


Figure 4. *Bountyella morgani* Gordon, 2014, a small coral-like bryozoan from 113 m near the Bounty Islands—scanning electron microscope image of zooids (width of field 1 mm).
 Photo: Dennis Gordon, NIWA

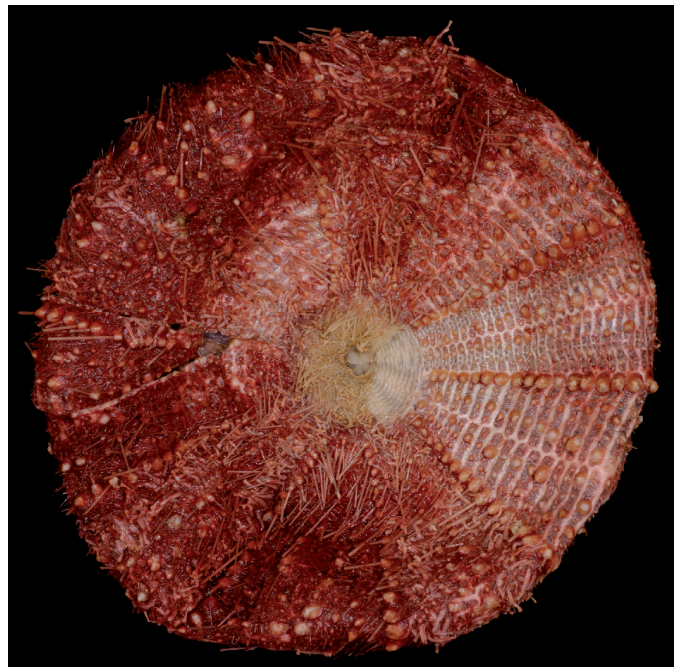


Figure 3. *Aræosoma bidentatum* Anderson, 2013, a 13 cm diameter sea urchin from 1060 m on the Chatham Rise.
 Photo: Owen Anderson, NIWA

to 12,500 named marine species for the World Register. At least 3000 more species are in New Zealand museum collections awaiting formal naming and description. NIWA's Dennis Gordon, who led New Zealand's marine species inventory, and two other NIWA biologists, are part of an editorial group that determines which species should be in the World Register. Dr Gordon also helped shape the higher-level management classification of life used by the World Register.



Figure 5. *Uroptychus* n. sp., a newly discovered undescribed species of squat lobster that is distributed from Chatham Rise to Macquarie Ridge.
 Photo: Karen Schnabel, NIWA

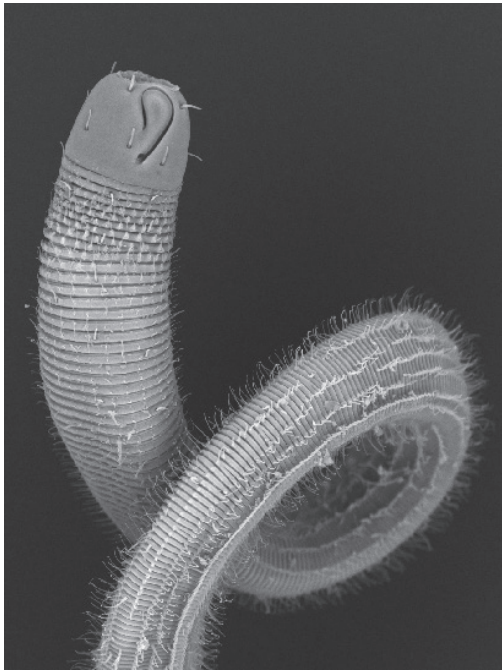


Figure 6. *Desmodorella* n. sp., one of several new nematode species recently discovered at a popular swimming beach at Hataitai, Wellington. It is about 1 mm long and quite common at this locality.
 Photo: Daniel Leduc, NIWA

The latest version of this classification is about to be published [Ruggiero et al. 2015]. Dr Gordon says New Zealand is still very much in the discovery phase when it comes to marine life. 'Marine BioBlitzes in recent years have discovered new species on Wellington's seashores, and NIWA's studies investigating vulnerable deep-water ecosystems have resulted in lots of new species,' he says.

In the past three years, NIWA biologists, assisted by visiting specialists from overseas, have discovered 141 new marine animals in the 60-year-old NIWA Invertebrate Collection, including specimens from recent research cruises. These comprised sponges, corals, sea anemones, bryozoans, round worms, sand hoppers, comma shrimps, seed shrimps, squat lobsters, and sea squirts. Several new seaweed and phytoplankton species have also been discovered and named.

Figure 8 (right). *Latronema* n. sp., a nematode predator of other nematodes, seen in oral view. Found at Hataitai Beach, Wellington, the worm is less than 1 mm long.

Photo: Daniel Leduc, NIWA



Figure 7. *Calvadosia* n. sp., one of two new species of stalked jellyfish (Staurozoa) that attach to brown seaweeds in Wellington's Taputeranga Marine Reserve. Its arm-tip-to-arm-tip diameter is about 2 cm.

Photo: Dennis Gordon, NIWA

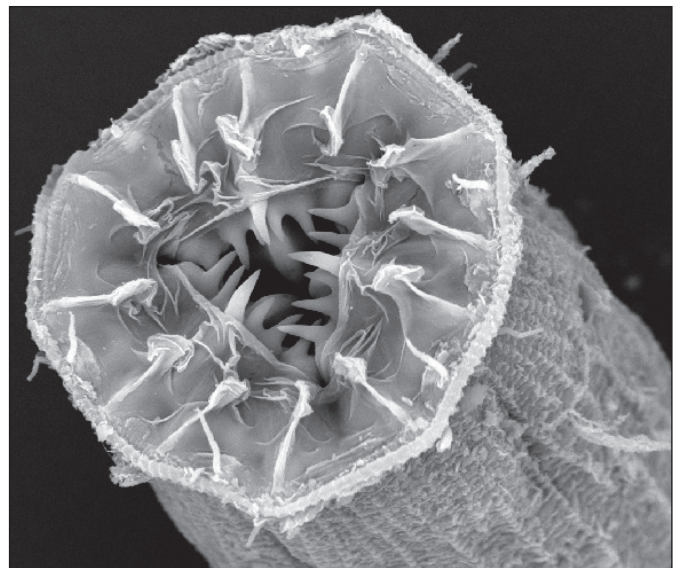


Figure 9 (right). *Oxydromus* n. sp., a small bristle worm (Polychaeta) that is found only in association with the sand-dollar urchin, living on its underside among the tiny spines that carpet the urchin's surface.

Photo: Geoff Read, NIWA



Having named species enhances the data quality of scientific research on marine ecosystems.

The NIWA Invertebrate Collection (NIC), as the name suggests, does not include fishes; those that NIWA may acquire in the course of its field collections and ocean cruises are contributed to Te Papa (Museum of New Zealand), whose taxonomists are describing the New Zealand marine fish fauna (as well as molluscs and Crustacea, *inter alia*).

As mentioned, New Zealand is still in the discovery phase concerning its marine biota, which is highly biodiverse—a recent review of New Zealand’s marine biodiversity (Gordon *et al.* 2010) noted that, whereas the area covered by the European Register of Marine Species (ERMS) is 5.5 times the area of the New Zealand EEZ (c. 4.2 million km²), it has only about twice as many species. Further, 51% of New Zealand’s marine species are endemic, the highest rate noted for any EEZ (Costello *et al.* 2010). Thousands more marine eukaryotic species are anticipated for our EEZ (Gordon *et al.* 2010).

As we grapple with the unfinished task of describing our marine biodiversity the hope is that the funded effort in New Zealand will continue, and that, aided by overseas specialists, it will be finished by the end of this century, which seems realistic, for eukaryotes at least (Costello *et al.* 2013).

Acknowledgments

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