

Polychaete diversity from western and northwestern Australia

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In 2003, 1,217 polychaete species were known from Australian waters, mostly from shallow southeastern waters. Here we review advances in the past 10 years, based on significant new collections from northern and northwestern Australia. This review is based on species richness estimates in 25 families.

Aims

- To review advances in taxonomic knowledge of Australian polychaetes over the past 10 years.
- To identify Australian regions where collections are generating most new taxa.
- To estimate numbers of morphospecies awaiting description.
- To promote incompletely-studied collections and their availability to researchers undertaking taxonomic revisions.

Materials

Data sources

Species numbers are taken from the references cited below. Additional data and undescribed (morphospecies) numbers are from the working documents of the coauthors.

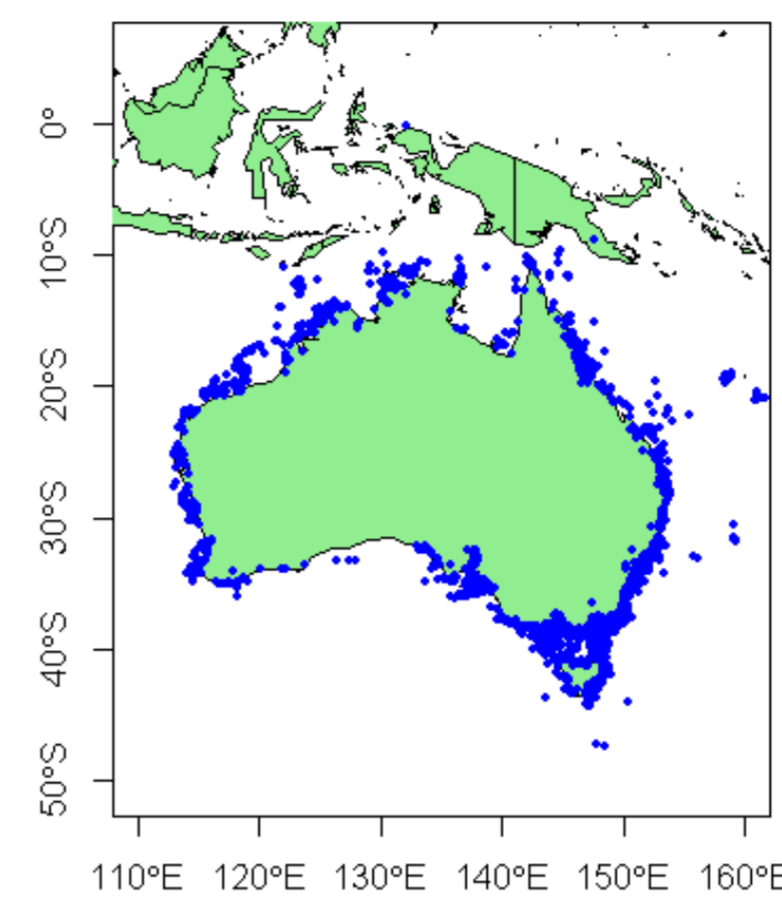
Collections

Sampling since the 1990s in western and northern Australia includes the Australian Government's CERF and NERP programs, especially surveys of the west coast from northern to southern extremity and at depths from 100 to 1000 m. Other significant contributions have been: explorations of the Kimberley and elsewhere in WA (2006-present); expeditions of the WA Museum (1990-present); benthic surveys of Darwin Harbour (1993); Joseph Bonaparte Gulf (2010) and a coral reef biodiversity assessment project (CREEFS, 2000-2010). See Acknowledgements for details.

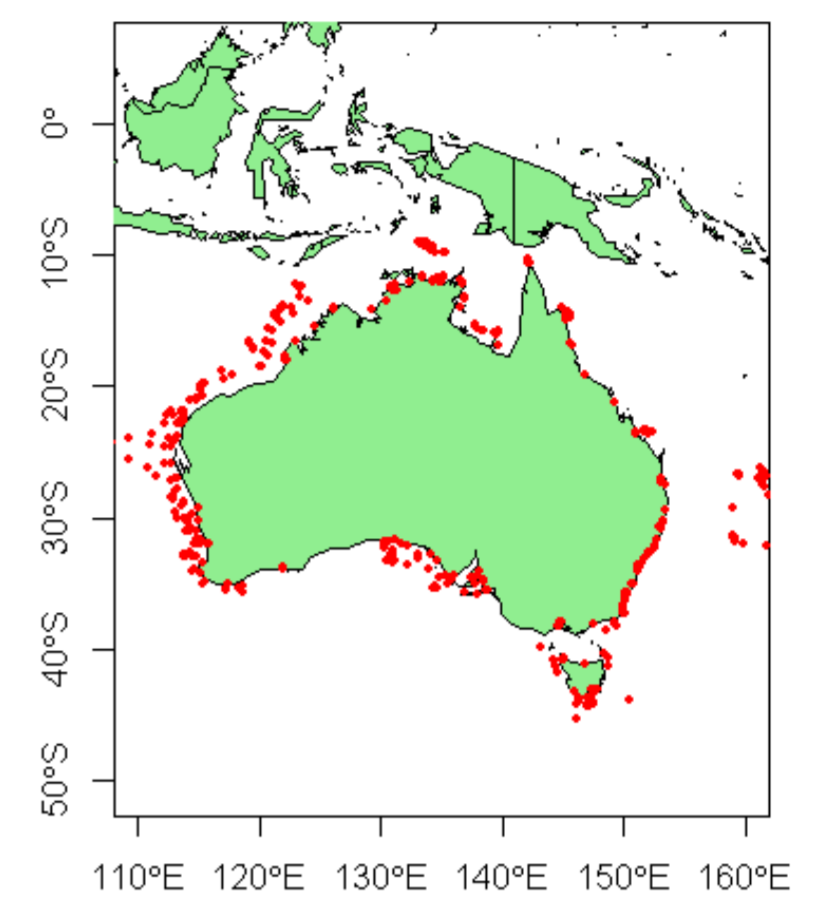
Family [source of data]	World spp.	Aust ⁿ species inc. morphospp.	Aust ⁿ morphospp. as % of total Aust spp.	Aust ⁿ described species as % of world total
Acoetidae [A.Murray]	59	11	82%	3%
Aphroditidae [R.Wilson]	126	26	18%	17%
Chrysopetalidae [C.Watson]	62	59	77%	26%
Eulepethidae [S.Woolley, R.Wilson]	26	4	0%	15%
Eunicidae [E.Greaves, R.Wilson]	425	63	18%	12%
Fauveliopsidae [R.Wilson]	22	2	100%	5%
Hartmaniellidae [R.Wilson]	2	2	100%	50%
Nereididae [C.Glasby, R.Wilson]	734	113	10%	14%
Onuphidae [H.Paxton]	366	60	34%	11%
Opheliidae [L.Avery, C.Glasby]	166	31	57%	9%
Oweniidae [M.Capa]	52	14	29%	23%
Pectinariidae [P.Hutchings]	58	5	0%	9%
Phyllodocidae [R.Wilson]	471	42	24%	7%
Pilargidae [C.Glasby, S.Marks]	106	35	90%	15%
Polygordiidae [L.Avery]	16	3	100%	13%
Polynoidae [K.Fauchald, R.Wilson]	910	115	24%	10%
Sabellariidae [M.Capa, P.Hutchings]	134	17	0%	13%
Sabellidae [M.Capa]	522	105	22%	16%
Travisia [L.Avery]	27	8	38%	19%
Serpulidae [E.Kupriyanova]	737	121	15%	14%
Spionidae [E.Greaves, K.Meißner, L.Walker, R.Wilson]	595	150	14%	22%
Sternaspidae [E.Keppel, C.Glasby]	17	5	80%	6%
Syllidae [M.T.Aguado, P.Álvarez-Campos & G.San Martín]	991	217	3%	21%
Terebellidae s.l. [C.Glasby, P.Hutchings]	564	103	0%	18%
Trichobranchidae [P.Hutchings]	70	11	0%	16%



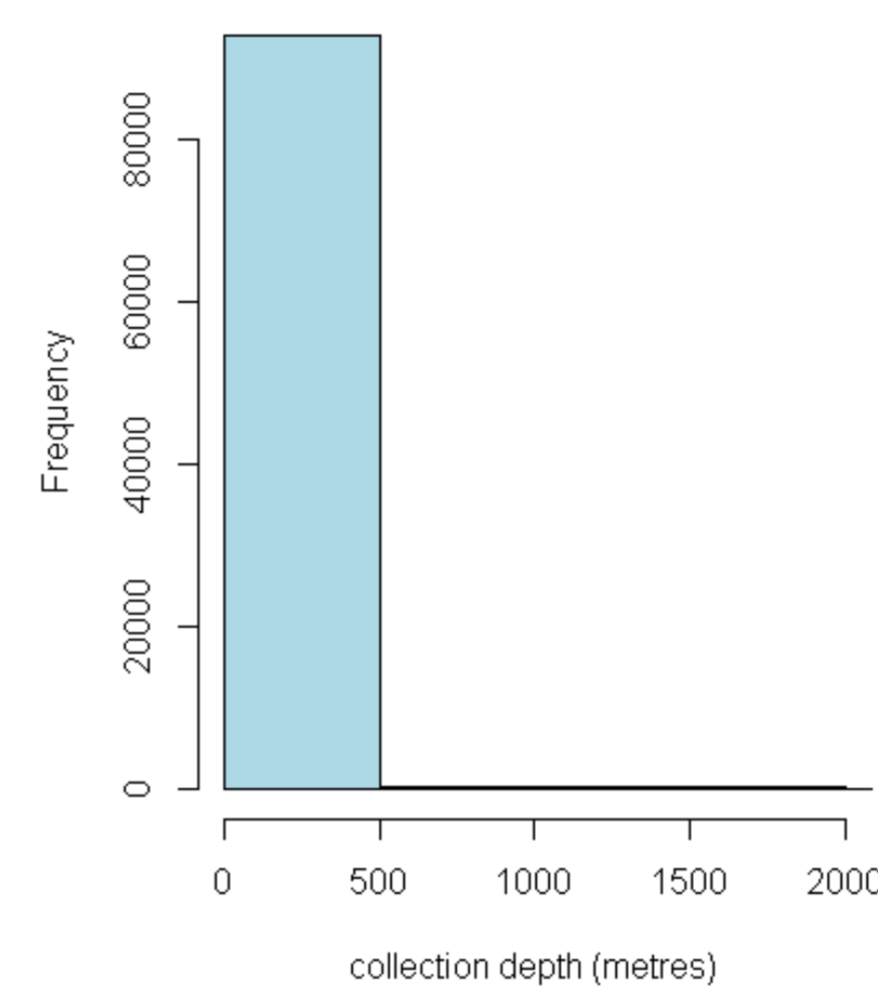
records 1900-2000, n=92954



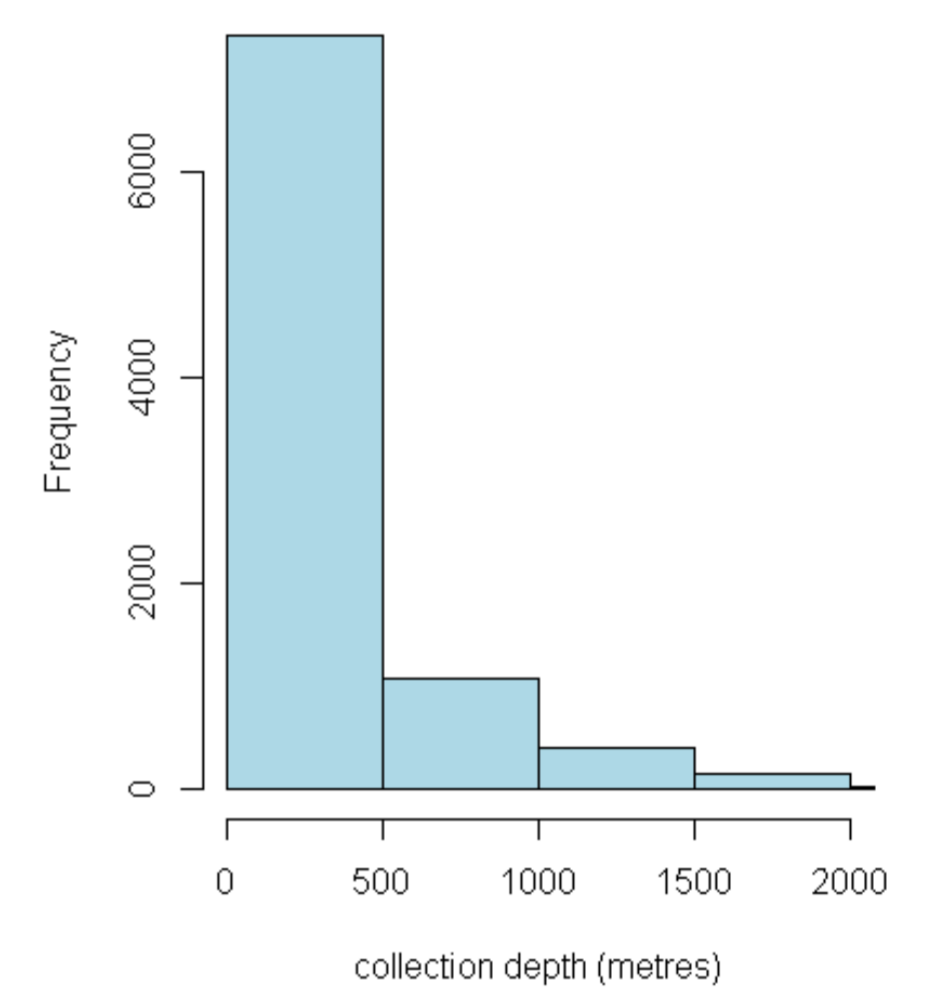
records 2001-2012, n=9059



records 1900-2000, n=92954



records 2001-2013, n=9059



Results

- These data represent 25 families comprising about 62% of the world fauna. Undescribed species ("morphospecies") range from 80-100% of all Australian species in species-poor families to 20-30% in species-rich families.
- Sampling in the past decade has added only 10% more records but almost exclusively from western and northwestern Australia and at depths previously poorly sampled, typically increasing known species richness by about 30%.
- For species-rich families which have been recently revised Australia typically has 15-25% of the world fauna.

References:

Beesley, P.L., Ross, G.J.B., and Glasby, C.J. (eds) 2000. *Polychaetes & Allies: The Southern Synthesis. Fauna of Australia Vol 4A*. CSIRO Publishing: Melbourne. xii + 465 pp.
 Hutchings, P.A., Johnson, R.T., and Yerman, M. 2010. Class POLYCHAETA Claparède, 1864. Australian Faunal Directory. Australian Biological Resources Study, Canberra, <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/POLYCHAETA:ANNELIDA>.
 Read, G.B., and Fauchald, K. 2013. World Polychaeta database. <http://www.marinespecies.org/polychaeta/index.php>.
 Wilson, R.S., Hutchings, P.A., and Glasby, C.J. 2003. *Polychaetes - An interactive identification guide [CD-ROM]*. CSIRO Publishing: Melbourne.

Acknowledgements:

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