



Global distribution and depth of the Bigfin squid *Magnapinna* spp

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Abstract

The Bigfin squid *Magnapinna* spp. is elusive and rarely encountered, yet its charismatic morphology of large fins and extraordinarily long tentacle filaments makes it an instantly recognisable deep-sea genus by both scientific and non-scientific audiences. The striking visual imagery of in-situ observations has resulted in as many records being published online via social media as they are in the scientific literature. Here we collate all known sightings of *Magnapinna* spp. across all reporting formats. In total we collated 46 individual sightings that includes 15 from the Gulf of Mexico (32.6%), ten from the Indian Ocean (21.7%), ten from the Atlantic Ocean (21.7%), nine from the Pacific Ocean (19.6%), and two from the Caribbean Sea (4.3%). Nineteen of these observations (41.3%) were published in eight scientific papers, while the remaining 27 (58.7%) were reported in online video repositories, news articles, social media posts or other online outlets. There were no reports from the polar regions and the farthest north and south it has been sighted is 28.5°N and 37.2°S respectively. However, seventeen records of captured specimens, that are also collated and discussed, show they are present to at least 44.1°N. Based on the in-situ records, *Magnapinna* spp. has a mean depth of 2992 m ± 1067 s.d. (range = 1578–6212 m), however nearly half of the specimen records show minimum depths in the top 600 m. The specimen records show that *Magnapinna* spp. is collected on average every 8.1 years while it is observed in situ every 0.8 years on average (with 73.9% of these observations from the last 20 years). This study places emphasis on how non-traditional scientific sources – particularly independent data collation initiatives and industry-generated footage – are valuable for resolving large-scale patterns in such charismatic genus.

Keywords Cephalopoda · Oegopsida · Magnapinnidae · Biogeography · Depth range · Citizen science

Introduction

Citizen science refers to collecting, categorising, transcribing or analysing scientific data by members of the public, often in collaboration with scientific institutions (Bonney et al. 2009). Citizen science contributions have been valuable in generating extensive datasets for scientific research from large volumes of data, both in terrestrial and marine

environments, partly owing to the accessibility of such data via the internet (Bonne et al. 2014] including via platforms as Zooniverse (<https://www.zooniverse.org/>). Citizen science for deep-ocean research poses a challenge on account of the inaccessibility of this environment to the general public compared to other areas of marine science (e.g., Marambio et al. 2021). Unlike in terrestrial or coastal ecosystems, engagement and gathering of data on deep ocean environments is dependent on ‘mediation’ by sensors, meaning that public engagement is filtered through technological interfaces; Lidström et al. 2023). At the same time, advances in deep-sea exploration, data collection and the capacity for in-situ and long-term observation are increasingly ‘datafying’ the deep sea. Manual processing of these large datasets is labour-intensive and time-consuming (Matabos et al. 2017). Public participation in deep-ocean research is therefore often focussed on analysing and aiding in species identification of large volume datasets already collected by scientists, sometimes referred to as ‘crowdsourcing’ (Langenkämper

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et al. 2019; Escobar-Briones et al. 2023), which may also function to train machine learning and artificial intelligence models (Katija et al. 2022, 2024).

Beyond formal citizen science platforms for example, access to remotely operated vehicles (ROVs) operating in deep-water by the oil and gas industry or simply pilots supplying footage of species for scientific use that they happen to encounter during subsea operations (Hudson et al. 2005; Gates et al. 2017). Such imagery, whether from ROVs or divers, are regularly posted on social media and regardless of if the intention was scientific or not, they can contribute to science on account of rarity and serendipity, contributing to distributional records and behavioural observations (e.g., Nascimento et al. 2024), or of “sampling the undersampled” (Callaghan et al. 2021). This type of citizen science and non-scientific industries can aid in research that can take many forms. This study is one such example.

The sharing of imagery on social media is driven by the desire to present interesting content which in this case, tends to favour the rare and charismatic fauna of the deep sea. In conservation and biodiversity science, charisma has traditionally been associated with large terrestrial mammals that elicit strong emotional and aesthetic responses (Albert et al. 2018). In the deep sea, however, charisma must operate differently as the remoteness of this environment means that aesthetic appeal is shaped almost entirely through mediated imagery, such as live streams, documentaries or social media posts. This aligns with what Lousley (2016) describes as a form of “biodiversity spectacle”, and where the greater the physical distance between audience and organism, the more powerful it can become as spectacle. Although such imagery increases visibility for ecosystems and is thought to foster curiosity and empathy, in the deep sea, public engagement, and by extension, charisma, is often rooted in rarity, strangeness or perceived otherworldliness (Jamieson et al. 2021).

The Bigfin squid *Magnapinna* spp. is one such ‘iconic’ deep-sea species due to its unique morphology of large fins relative to mantle size, and extremely long ‘spaghetti-like’ tentacle filaments (Osterhage et al. 2020). There are three known species; *M. pacifica* (Vecchione and Young 1998), *M. atlantica* (Vecchione and Young 2006), and *M. talismani* (Fisher and Joubin 1906). Not much is known about its life history, and it appears elusive and rarely encountered. Paradoxically, despite its rarity it is both an instantly recognisable and fascinating deep-sea genus by both scientific and non-scientific audiences alike. The striking visual imagery of in-situ observations have resulted in as many encounters being published on-line via social media (mostly from the subsea oil and gas industry) as they are in the scientific literature.

The infamy of *Magnapinna* spp. as elusive and poorly understood has generated such online interest that paradoxically there is an ever-growing corpus of data on its biogeography and depth range emerging through these non-conventional channels. The *Magnapinna Archive* (<https://www.youtube.com/@MagnapinnaArchive>) is a YouTube channel that was established in 2021 to source and archive all known footage of the Bigfin Squid that emerges from scientific or subsea-industry sources. Collating these videos and associated metadata forms another layer of citizen science, based on the curation of a diverse set of rare encounters. *Magnapinna Archive* has become a more comprehensive *Magnapinna* dataset than anything published in scientific literature or available from traditional biodiversity databases, demonstrating how independent citizen initiatives complement formal scientific research.

Here we report on the depth and geographic location of each sighting of *Magnapinna*, and for completeness we have collated the records of all known samples to provide an overview of the three-dimensional expanse of this infamous squid.

Materials and methods

Observations and specimens

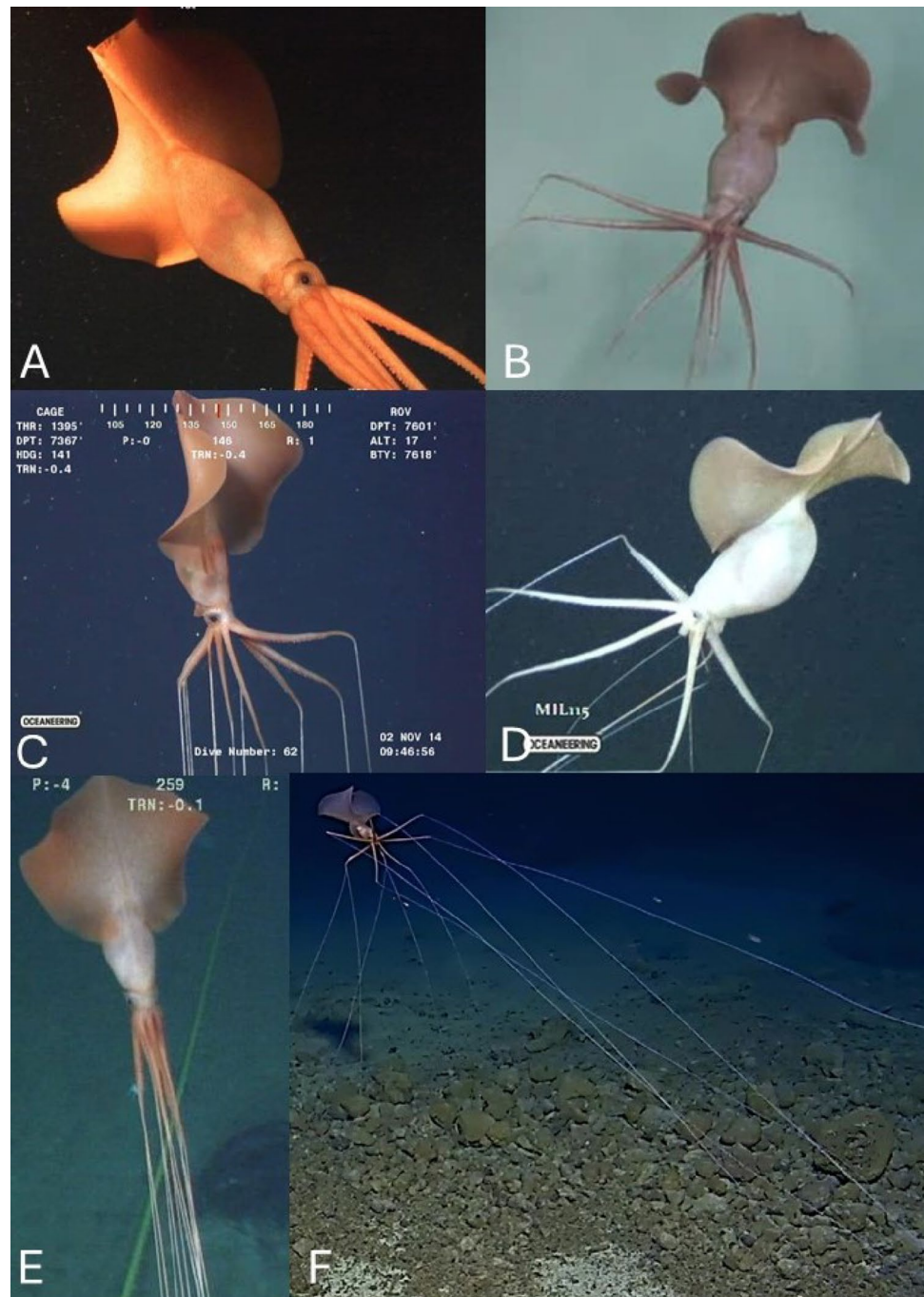
To date *Magnapinna Archive* has posted 33 videos sourced from social media and news outlets (listed in Supplemental 1). Some these videos have also been reported in scientific literature such as Guerra et al. (2002), Guerrero-Kommritz et al. (2018), Gerdes et al. (2021), and Jamieson et al. (2024). A total of nineteen observations has been published across eight scientific papers which are (in addition to the above): Vecchione et al. (2001), Osterhage et al. (2020), Jamieson and Vecchione (2022), and Swanborn et al. (2025). The total combined number of in-situ sightings was 46 (Table 1).

Records were collated from the online data repositories the Ocean Biodiversity Information System (OBIS; Holland 2009), the Global Biodiversity Information Facility (GBIF; Telenius 2011). A total of 17 specimens were identified, where 10 were reported in Vecchione and Young (1998, 2006), and Judkins et al. (2017). The remaining were unpublished museum records (Table 2).

Distribution calculations

The global ocean area and volume potentially inhabited by *Magnapinna* spp. were estimated based on its documented depth range. Bathymetric data were obtained from the General Bathymetric Chart of the Oceans (GEBCO) 2025 grid (GEBCO Bathymetric Compilation Group, 2025) and

Fig. 1 The bigfin squid *Magnapinna*. A-E are images obtained through commercial ROVs working in the oil and gas industry in the Gulf of Mexico, F is from 3252 m deep in the Tonga Trench (SW Pacific Ocean) and details the unique long tentacle filaments



resampled to a spatial resolution of 30 arc-seconds (≈ 926 m at the equator). Analyses were restricted to the latitudinal range of known *Magnapinna* spp. observations and collections, corresponding to the known distributional (latitudinal) limits of the species. Bathymetry was clipped to both the specified depth interval and latitudinal extent prior to analysis. To ensure accurate global-scale area estimates, all spatial processing and area calculations were conducted using the Mollweide equal-area projection (ESRI:54009).

All reprojection, raster processing, and area and volume computations were performed in Python (Spyder v3.8).

Results

Of the 46 individual sightings, 15 were from the Gulf of Mexico (32.6%), ten from the Indian Ocean (21.7%), ten from the Atlantic Ocean (21.7%), nine from the Pacific Ocean (19.6%), and two from the Caribbean Sea (4.3%).

Table 1 All recorded in-situ observations of the Bigfin squid *Magnapinna* spp. from online sources (see Suppl. 1) and scientific literature

Year	Date	Ship	Gear	Latitude (DD)	Longitude (DD)	Location	Depth (m)	References
1988	Sep-11	RV <i>Nadir</i> [Vermanuate Exp.]	HOV <i>Nautile</i>	10.850	−40.883	North Atlantic	4735	Guerra et al. (2002)
1992	Jul.	RV <i>Nadir</i> [Equanaute Exp.]	HOV <i>Nautile</i>	3.67	−2.50	North Atlantic	3010	Guerra et al. (2002)
1992	Jul.	RV <i>Nadir</i> [Equanaute Exp.]	HOV <i>Nautile</i>	3.68	−2.51	North Atlantic	2950	Guerra et al. (2002)
1998	Nov.	RV <i>Yokusuka</i> [Cr. YK98-08]	HOV <i>Shinkai</i> 6500	−32.75	57.025	Indian Ocean	2340	Vecchione et al. (2001)
2000	Jan.	ODS <i>Millenium Explorer</i>	Commercial ROV	28.625	−88.000	Gulf of Mexico	2195	Suppl. 1
2000	May	RV <i>Atalante</i> [Gimnaut Exp.]	HOV <i>Nautile</i>	19.540	65.833	Indian Ocean	2576	Guerra et al. (2002)
2000	Oct.	RV <i>Atlantis</i> [AT3-58]	DSV <i>Alvin</i>	27.58	−88.50	Gulf of Mexico	1940	Vecchione et al. (2001)
2001	May-16	RV <i>Western Flyer</i>	ROV <i>Tiburón</i>	21.9	−158.097	North Pacific	3380	Vecchione et al. (2001)
2001	Sep-04	RV <i>Kairei</i> [KR01-12]	ROV <i>Kaikō</i>	19.13	−155.097	North Pacific	2586	Suppl. 1
2001	Sep-13	RV <i>Kairei</i> [KR01-12]	ROV <i>Kaikō</i>	19.83	−154.54	North Pacific	3890	Suppl. 1
2003	Nov-26	ODS <i>Discover Deep Seas</i>	ROV <i>Hercules</i> 8	26.08	−94.623	Gulf of Mexico	2750	Suppl. 1
2003	Dec-29	ODS <i>Discover Deep Seas</i>	ROV <i>Hercules</i> 9	26.25	−94.666	Gulf of Mexico	3050	Suppl. 1
2007	Nov-11	Shell Perdido	Commercial ROV	26.128	−94.898	Gulf of Mexico	2500	Suppl. 1
2009	Jan-16	DMT <i>Emerald</i>	Triton XLS-23	26.50	−94.583	Gulf of Mexico	2453	Suppl. 1
2009	Jun-08	n.s.	Commercial ROV	27.606	−86.749	Gulf of Mexico	2593	Suppl. 1
2011	Jan-11	RV <i>Pourquoi Pas?</i>	ROV Victor 6000	−5.801	9.708	South Atlantic	3151	Suppl. 1
2011	Feb-11	RV <i>Pourquoi Pas?</i>	ROV Victor 6000	−4.756	9.94	South Atlantic	3082	Suppl. 1
2011	Dec-11	RV <i>Pourquoi Pas?</i>	ROV Victor 6000	−5.8	9.708	South Atlantic	3152	Suppl. 1
2011	Dec-11	RV <i>Pourquoi Pas?</i>	ROV Victor 6000	−6.702	5.489	South Atlantic	4941	Suppl. 1
2012	Jan-12	RV <i>Pourquoi Pas?</i>	ROV Victor 6001	−6.705	5.792	South Atlantic	4944	Suppl. 1
2012	Apr-27	RV <i>Okeanos Explorer</i> [EX1202]	ROV <i>Little Hercules</i>	26.304	−93.433	Gulf of Mexico	1961	Suppl. 1
2013	Jul-10	n.s.	Commercial ROV	26.595	−91.133	Gulf of Mexico	1578	Suppl. 1
2013	Jul-29	n.s.	Commercial ROV	28.253	−88.837	Gulf of Mexico	1784	Suppl. 1
2013	Nov-14	n.s.	ROV Millennium	26.13	−94.88	Gulf of Mexico	2388	Suppl. 1
2014	Jun-12	n.s.	ROV Millennium	28.15	−87.60	Gulf of Mexico	2278	Suppl. 1
2014	Apr-23	RV <i>Thomas G. Thompson</i> [TN309]	Abyssal Lander	−37.220	−179.774	South Pacific	4708	Jamieson and Vecchione (2022)
2014	Jun-27	RV <i>Nautilus</i> [Exp. NA043]	ROV <i>Hercules</i>	28.754	−88.099	Gulf of Mexico	1687	Suppl. 1
2014	Nov-02	n.s.	ROV Millennium	28.59	−87.84	Gulf of Mexico	2317	Suppl. 1
2015	Nov-15	RV <i>Investigator</i> [IN2015-C01]	Towed Camera	−34.432	129.987	Indian Ocean	2178	Osterhage et al. (2020)
2015	Nov-16	RV <i>Investigator</i> [IN2015-C01]	Towed Camera	−34.377	129.985	Indian Ocean	2110	Osterhage et al. (2020)
2016	Jan-19	RV <i>Pourquoi Pas?</i> [INDEX2016]	ROV <i>Victor</i>	−25.451	69.909	Indian Ocean	3664	Gerdes et al. (2021)
2017	Feb-14	n.s.	Commercial ROV	9.207	−76.832	Caribbean Sea	1884	Guerrero-Kommritz et al. (2018)
2017	Mar-24	REM <i>Etive</i> [IN2017_C01]	ROV FCV 3000	−35.049	130.905	Indian Ocean	3060	Osterhage et al. (2020)
2017	Mar-25	REM <i>Etive</i> [IN2017_C01]	ROV FCV 3000	−35.049	130.905	Indian Ocean	3002	Osterhage et al. (2020)
2017	Mar-25	REM <i>Etive</i> [IN2017_C01]	ROV FCV 3000	−35.050	130.904	Indian Ocean	3056	Osterhage et al. (2020)
2017	Apr-14	n.s.	Commercial ROV	9.433	−76.748	Caribbean Sea	2294	Guerrero-Kommritz et al. (2018)
2019	Sep-03	RV <i>Falkor</i> [FK190831]	ROV <i>SuBastian</i>	23.039	−162.950	North Pacific	2092	Suppl. 1
2020	Jan-28-	RV <i>Falkor</i> [FK200126]	ROV <i>SuBastian</i>	−34.394	119.376	Indian Ocean	3000	Suppl. 1
2021	Mar.	DSSV <i>Pressure Drop</i> [Ring of Fire Exp.]	DSV <i>Limiting Factor</i>	11.523	126.140	North Pacific	6212	Jamieson and Vecchione (2022)
2021	Dec.	RV <i>Pelagia</i> [BGR 2021]	ROPOS	−25	70	Indian Ocean	3000	Suppl. 1
2021	Nov-09	RV <i>Okeanos Explorer</i> [Windows to the deep Exp.]	ROV <i>Deep Discoverer</i>	24.381	−84.111	Gulf of Mexico	2400	Suppl. 1
2023	Apr-04	RV <i>Falkor</i> (too)	ROV <i>SuBastian</i>	20.5	−45.6	North Atlantic	1931	Suppl. 1
2024	Sept.	RV <i>Dagon</i> [DG2402]	Hadal-Lander <i>Archie</i>	−23.46	−175.67	South Pacific	3252	Jamieson et al. (2024)

Table 1 (continued)

Year	Date	Ship	Gear	Latitude (DD)	Longitude (DD)	Location	Depth (m)	References
2025	Apr.4	RV <i>Dagon</i> [DG2503]	Hadal-Lander <i>Archie</i>	3.96	−32.37	North Atlantic	3301	Swanborn et al. (2025)
2025	Oct.	RV <i>Nautilus</i> [NA176]	ROV <i>Hercules</i>	−17.526	−159.676	South Pacific	5180	Suppl. 1
2025	Oct-25	RV <i>Nautilus</i> [NA176]	ROV <i>Hercules</i>	−17.531	−159.619	South Pacific	5125	Suppl. 1

(Fig. 2). There were no reports from the polar regions and the farthest north and south it has been sighted is 28.5°N and 37.2°S respectively. However, sixteen records of specimen capture, that are also collated and discussed, show they are present to at least 44.1°N.

Many of the caught specimens had depths listed as ranges from the maximum depth of a trawl to the surface, therefore the exact depth of capture is obscure. For example, Vecchione and Young (1998) describe *M. pacifica* from the RV *Anton Bruun* from 0 to 2900 m and Schiel (2009) reports *M. atlantica* from an RV *Polarstern* expedition being from 1000 to 2000 m. Interestingly, many physical specimens are recorded with depth ranges of between hundred to several hundred metres (e.g., Vecchione and Young (1998), Judkins et al. (2017) Chaney et al. (2024) and Guerrero et al. (2025) which is considerably shallower than the in-situ observation (minimum depth = 1578 m).

Based on the more accurate in-situ depth records, *Magnapinna* spp. has a mean depth of 2992 m ± 1067 s.d. (range = 1578–6212 m), and a maximum depth of 6212 m (Jamieson and Vecchione 2022) (Fig. 3). However, taking into account the shallower collections and therefore assuming a minimum depth of 200 m (Guerrero et al. 2025) across the latitudinal range of between 44.1°N and 37.2°S, the Bigfin squid has a global footprint of ~225,130,000 km², which corresponds to a global inhabitable volume of ~927,480,000 km³. In terms of percentage of the world's oceans, these values of 62% and 70% respectively.

Discussion

Magnapinna spp. is somewhat unique in that it was first collected in 1883 and not formally described for another 115 years (Vecchione and Young 1998), and physical specimens are, on average, only being collected every 8 years worldwide. The recent increase in video being obtained from the deep sea (Bell et al. 2025), primarily through scientific and industrial activities has led to more records in the form of in-situ observations emerging. For example, in the last 20 years there has been 34 recorded encounters with *Magnapinna* spp. which accounts for 74% of all sightings.

A record collection of this size has emerged largely due to the number of ROV sightings recorded during subsea oil and gas activities operating within the depth range of

Magnapinna spp. This, coupled with the desire to post these images and videos on social media, and platforms such as the *Magnapinna Archive*, which collate this data, forms the basis of a robust and ever-growing database on an otherwise difficult animal to study.

This database revealed that *Magnapinna* spp. has an extraordinary depth and geographical range, potentially occupying 70% of the total global ocean volume. Their absence from the polar regions cannot be fully confirmed as short weather windows and reduced industrial activity mean that the amount of filming in these regions may be insufficient. Their distribution between 37°S and 41°N maybe a combination of reduced operational weather windows with higher latitudes and globally, the reduced amount of scientific sampling in these areas (Bell et al. 2025). Likewise, the relatively high number of encounters in the Gulf of Mexico is likely due to a higher probability of sightings with so many industrial ROVs operating in deep-water.

Methods of detection are also biased towards ROVs and submersibles that account for 87% of all sightings in situ, the rest being towed cameras and benthic landers. The majority (82%) of physical samples were obtained via various trawls and nets. It is difficult to explain why 41% of specimen collections occurred in the top 600 m and the shallowest in-situ observation is 1578 m. Perhaps the large work class ROVs and scientific submersibles that are built to work and explore the deep sea (and apparently most likely to encounter *Magnapinna* spp.), are not making shallower dives with the same frequency as deeper dives. Conversely, midwater trawling gear, such as MOCNESS, are more common in the top 1000 m. It also worth noting that Merten et al. (2021) also detected *Magnapinna* sp. between 1900 and 2500 m off Cabo Verde (eastern tropical Atlantic Ocean) using environmental DNA (eDNA) analysis.

The challenges of species identification (*M. pacifica*, *M. atlantica*, *M. talismani* or undescribed species) from in-situ video excludes any predictions of population distribution at the species level, and for the time being must remain at the more conservative genus level. It is clear, however, that the genus *Magnapinna* is ubiquitous across the Pacific, Atlantic and Indian oceans at tropical and temperate latitudes, albeit concluded from very disparate locations. Its depth range places its optimal habitat across the bathyal and abyssal depths with only one hadal record being known (Fig. 2).

Table 2 All known collected specimens of the Bigfin Squid *Magnapinna* spp. where n.s. = not specified, and n.a. = not applicable. (MNHM=Museum National d'Histoire Naturelle, Paris, BMNH=British Museum of Natural History, London, USNM=United State Natural History Museum, MCZ=Museum of Comparative Zoology, Cambridge, SBMNH=Santa Barbara Museum of Natural History, Santa Barbara, FMNH=Field Museum of Natural History, Chicago, ICM=Institut de Ciències del Mar, Barcelona)

Year	Date	Ship	Gear	Latitude (DD)	Longitude (DD)	Location	Depth (m)	Catalog#/Comment	References
1883	Aug-10	Talisman [1883 Exp.]	n.s.	34.846	−36.183	North Atlantic	3175	MNHN-IM-1999-23523, Juvenile/sub-adult, trawl damage, missing arms; “ <i>Chroteuthopsis talismani</i> ”	Vecchione and Young (2006)
1924	Sep-09	S.S. <i>Pickle</i>	n.s.	n.s.	n.s.	South Atlantic	439	BMNH 1924.9.9.48, <i>Magnapinna</i> sp., designated “ <i>Octopodoteuthopsis</i> sp. A”	Vecchione and Young (2006)
1954	Mar-18	J.E. Fitch	n.s.	30.3333	−129.75	North Pacific	N/A	USNM 885,787, From <i>Alepisaurus ferox</i> stomach content	Vecchione and Young (1998)
1961	May-2–3	RV <i>Chain</i> [Cr. 17]	n.s.	11.192	−29.893	North Atlantic	0–229	MCZ Malacology 370,373	N/A
1966	Jan-16	RV <i>Anton Bruun</i>	n.s.	−34.016	−84.967	South Pacific	0–2900	MCZ Malacology 392,887, <i>M. pacifica</i>	Vecchione and Young (1998)
1985-87	n.s.	n.s.	n.s.	n.s.	n.s.	North Pacific	0–300	SBMNH 144,791, Unknown larva, described as “big-fin”	Chaney et al. (2024)
1995	Apr-23	NOASS <i>David Starr Jordan</i> [Cr. 9505-24]	Bongo Net	33.828	−121.843	South Pacific	0–200	USNM 885,786, <i>M. pacifica</i>	Vecchione and Young (1998)
1955	Sep-16	n.s.	n.s.	27.153	−86.123	Gulf of Mexico	N/A	USNM 1,086,800, <i>M. atlantica</i> holotype	Vecchione and Young (2006)
1997	Jun-21	RRS <i>Discovery</i> [St. 13198-7]	n.s.	37.14	−32.30	North Atlantic	N/A	BNMH 20,060,134, <i>M. atlantica</i>	Vecchione and Young (2006)
2004	Jul-11	RV <i>G.O. Sars</i> [MAR-ECO]	Trawl	42.133	−29.05	North Atlantic	N/A	ZMBN 77,634	Vecchione and Young (2006)
2006	May	RV <i>Atlantis</i> [AT15-03]	DSV <i>Alvin</i>	26.083	−94.608	Gulf of Mexico	2928–2489	FMNH 308,253, Badly damaged adult male	N/A
2006	May	RV <i>Atlantis</i> [AT15-03]	DSV <i>Alvin</i>	26.180	−94.623	Gulf of Mexico	2739	FMNH 308,252, sub-adult male	N/A
2007	Nov.	RV <i>Polarstern</i> [ANT XXIV-4]	MOCNess	3.216	−15.00	North Atlantic	1000–2000	Catalog n.s., <i>M. atlantica</i>	Schiel (2009)
2011	Feb-25	MV <i>Meg Skansi</i> [St. B246N]	MOCNess	28	−89	Gulf of Mexico	200–600	Catalog n.s., <i>M. pacifica</i>	Judkins et al. (2017)
2011	Sep-15	MV <i>Meg Skansi</i> [St. SE5D]	MOCNess	28	−89	Gulf of Mexico	200–600	Catalog n.s., <i>M. pacifica</i>	Judkins et al. (2017)
2018	Jun-03	n.s.	Pelagic trawl	30.026	−19.758	North Atlantic	100–200	ICMC000146	Guerrero et al. (2025)
2020	n.s.	RV <i>Falkor</i> (Ningaloo Canyons)	ROV SuBastian	−21.775	112.613	Indian Ocean	1937	S112115	Guerrero et al. (2025)

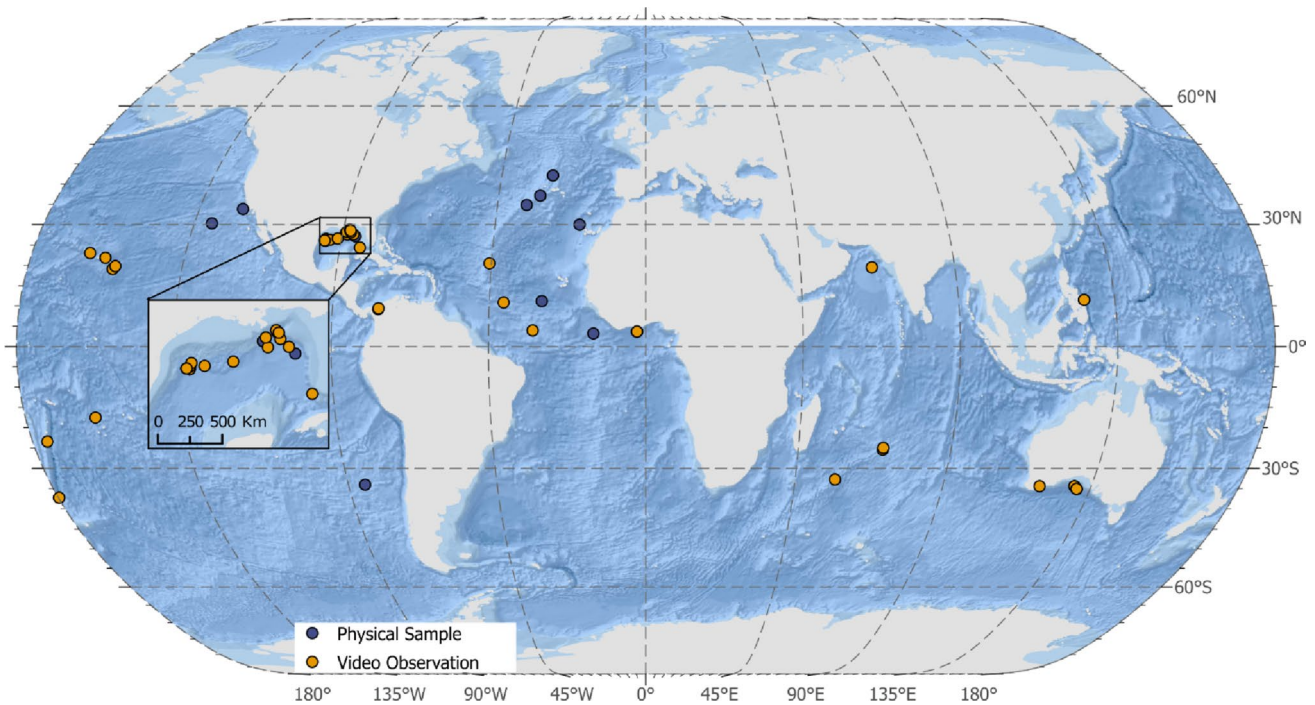


Fig. 2 Global locations of all known *in-situ* observation (orange dots) and physical samples (blue dots). Inset shows Gulf of Mexico

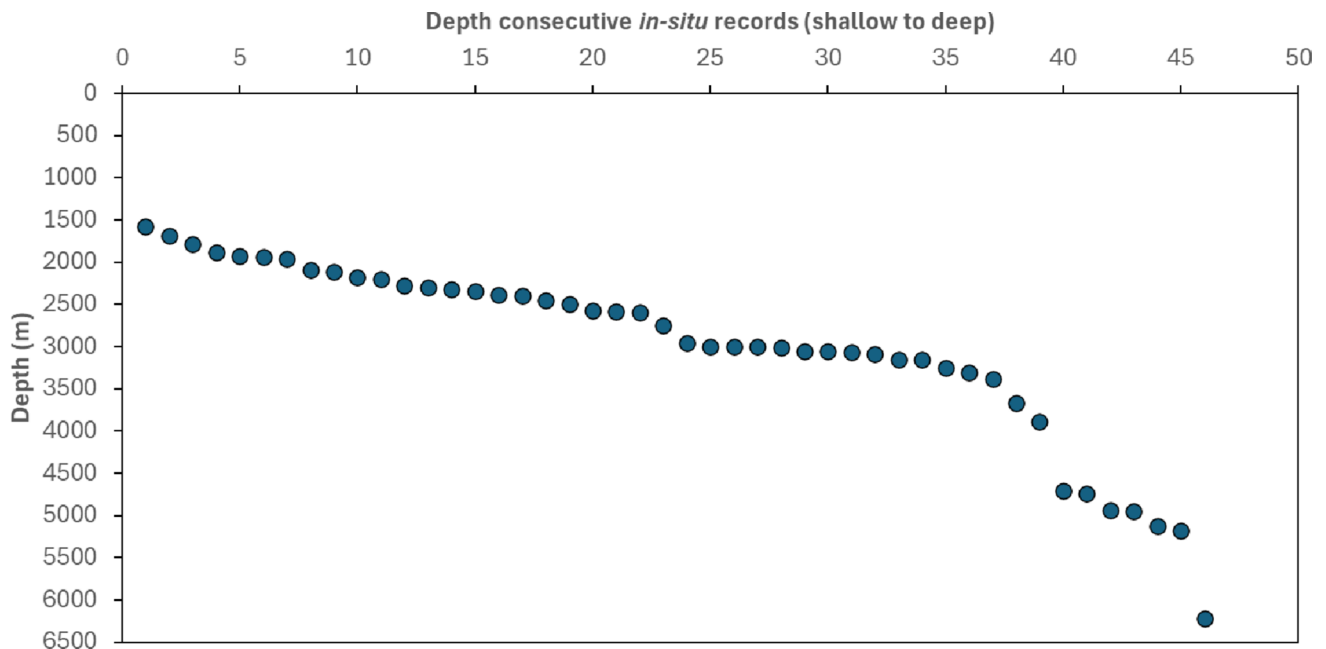


Fig. 3 Depth, ordered from shallow to deep, of 46 in situ observations of *Magnapinna* spp. where the mean depth is $2992 \text{ m} \pm 1067 \text{ s.d.}$ (range=1578–6212 m)

The public perception of the *Magnapinna* spp. as iconic and intriguingly elusive provides the impetus to share encounters that in turn have revealed it be a genus with an extraordinary large geographic range. Within that range it has a very low population density. Its elusiveness is perhaps a result of this form of rarity, that when coupled with its

unusual external morphology (unique among all the cephalopods) creates an infamy and appreciation that inspires and leads to public appreciation, which in turn has led to a greater scientific understanding of the animal.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s00227-0>

26-04927-1.

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Author contributions AJJ and JD conceptualized of the study based on JC and JDs database. AJJ and DJBS wrote the original draft, YN performed the volume and area calculations, and all authors edited, reviewed, and approved the final manuscript.

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Data availability All data is included in this paper and supplemental material.

Declarations

Conflict of interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

Ethical approval No ethical approvals were sought on account of no animals being used in this study.

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References

- Albert C, Luque GM, Courchamp F (2018) The twenty most charismatic species. *PLoS ONE* 13(7):e0199149
- Bell KL, Johannes KN, Kennedy BR, Poulton SE (2025) How little we've seen: A visual coverage estimate of the deep seafloor. *Sci Adv* 11(19):eadp8602.
- Bonne R, Shirk JL, Phillips TB, Wiggins A, Ballard HL, Miller-Rushing AJ, Parrish JK (2014) Next steps for citizen science. *Science* 343(6178):1436–1437
- Bonney R, Cooper CB, Dickinson J, Kelling S, Phillips T, Rosenberg KV, Shirk J (2009) Citizen science: a developing tool for expanding science knowledge and scientific literacy. *Bioscience* 59(11):977–984
- Callaghan CT, Poore AG, Mesaglio T, Moles AT, Nakagawa S, Roberts C, Rowley JJ, Vergès A, Wilshire JH, Cornwell WK (2021) *Bio-science* 71(1):55–63 Three frontiers for the future of biodiversity research using citizen science data
- Chaney H, Geiger D, Delnavaz V (2024) Santa Barbara Museum of Natural History - Invertebrate Zoology. Version 1.30. Santa Barbara Museum of Natural History. Occurrence dataset. <https://doi.org/10.15468/e8txdn>. <https://www.gbif.org/occurrence/4103857716> accessed via GBIF.org on 2026-02-10
- Escobar-Briones E, Álvarez-Sánchez LF (2023) Citizen Science for Deep Ocean Biodiversity: A Crowdsourcing Tool in Support of Conservation. *Mexican Fauna in the Anthropocene*. Springer International Publishing, Cham, pp 581–593
- Fischer H, Joubin L (1906) Note sur les Céphalopodes capturés au cours des expéditions du Travailleur et du Talisman. *Bull Musé Nat d'Hist Natur* 12:202–205
- Gates AR, Benfield MC, Booth DJ, Fowler AM, Skropeta D, Jones DO (2017) Deep-sea observations at hydrocarbon drilling locations: Contributions from the SERPENT Project after 120 field visits. *Deep Sea Res Part II* 137:463–479
- Gerdes K, Kihara TC, Arbizu PM, Kuhn T, Schwarz-Schampera U, Mah CL, Norenburg JL, Linley TD, Shalaeva K, Macpherson E, Gordon D (2021) Megafauna of the German exploration licence area for seafloor massive sulphides along the Central and South East Indian Ridge (Indian Ocean). *Biodivers Data J* 9:e69955
- Guerra A, González AF, Rocha F, Segonzac M, Gracia J (2002) Observations from submersibles of rare long-arm bathypelagic squids. *Sarsia* 87(2):189–192
- Guerrero E, Abelló P, Lombarte A, Villanueva R, Ramón M, Sabatés A, Santos R (2025) Marine Biological Reference Collections: CBMR-General (ICM-CSIC). Version 1.32. Institut de Ciències del Mar (CSIC). Occurrence dataset <https://doi.org/10.15470/qlq-qdx> accessed via GBIF.org on 2026-02-10. <https://www.gbif.org/occurrence/2628671374>
- Guerrero-Kommritz J, Cantera J, Puentes V, Leon J (2018) First observations of the bigfin squid *Magnapinna* sp. in the Colombian Southern Caribbean. *Biodivers Data J* (6): e24170
- Holland G (2009) Ocean Biogeographic Information System (OBIS). UNESCO
- Jamieson AJ, Vecchione M (2022) Hadal cephalopods: first squid observation (Oegopsida, Magnapinnidae, *Magnapinna* sp.) and new records of finned octopods (Cirrata) at depths >6000 m in the Philippine Trench. *Mar Biol* 169(1):11
- Jamieson AJ, Singleman G, Linley TD, Casey S (2021) Fear and loathing of the deep ocean: why don't people care about the deep sea? *ICES J Mar Sci* 78(3):797–809
- Jamieson AJ, Stewart HA, Kolbusz J, Swanborn D, Nester G (2024) Tonga Trench Expedition Report. Inkfish Open Ocean Program pp 74. <https://doi.org/10.5281/zenodo.14094651>
- Hudson IR, Jones DOB, Wigham DB (2005) A review of the uses of work-class ROVs for the benefits of science: lessons learned from the SERPENT project. *Underw Technol* 26(3):83–88
- Judkins H, Vecchione M, Cook A, Sutton T (2017) Diversity of mid-water cephalopods in the northern Gulf of Mexico: comparison of two collecting methods. *Mar Biodivers* 47(3):647–657
- Katija K, Orenstein E, Schlining B, Lundsten L, Barnard K, Sainz G, Boulais O, Cromwell M, Butler E, Woodward B, Bell KL (2022) FathomNet: a global image database for enabling artificial intelligence in the ocean. *Sci Rep* 12(1):15914
- Katija K, Carlsen L, Sainz G, Daniels J, Barnard K, Shah G, Patterson G, Berings E, Pepelanova M, van Baalen G, Woodward B (2024) FathomVerse: Where gaming meets community science to explore our ocean. In *Amer Geophys U, Ocean Sci Meet pp*. ED33A-07
- Langenkämper D, Simon-Lledo E, Hosking B, Jones DO, Nattkemper TW (2019) On the impact of citizen science-derived data quality on deep learning based classification in marine images. *PLoS One* 14(6):e0218086
- Lidström S, Wickberg A, Gärdebo J (2023) Ocean environing media: Datafication of the deep sea. *Environing media*. Taylor & Francis

- Lousley C (2016) Charismatic life: Spectacular biodiversity and biophilic life writing. *Environ Comm* 10(6):704–718
- Marambio M, Canepa A, López L, Gauci AA, Gueroun SK, Zampardi S, Boero F, Yahia OKD, Yahia MND, Fuentes V, Piraino S (2021) Unfolding jellyfish bloom dynamics along the Mediterranean basin by transnational citizen science initiatives. *Diversity* 13(6):274
- Matabos M, Hoeberechts M, Doya C, Aguzzi J, Nephin J, Reimchen TE, Leaver S, Marx RM, Branzan Albu A, Fier R, Fernandez-Arcaya U (2017) Expert, crowd, students or algorithm: who holds the key to deep-sea imagery ‘big data’ processing? *Methods Ecol Evol* 8(8):996–1004
- Merten V, Bayer T, Reusch TB, Puebla O, Fuss J, Stefanschitz J, Lischka A, Hauss H, Neitzel P, Piatkowski U, Czudaj S (2021) An integrative assessment combining deep-sea net sampling, in situ observations and environmental DNA analysis identifies Cabo Verde as a cephalopod biodiversity hotspot in the Atlantic Ocean. *Front Mar Sci* 8:760108
- Nascimento LS, Haddad MA, Nogueira M (2024) The first record of the deep-sea jellyfish *Stygiomedusa gigantea* (Scyphozoa: Semaestomeae) from the tropical Southwestern Atlantic found on social media. *Zoologia (Curitiba)* 41:e23082
- General Bathymetric Chart of the Oceans (GEBCO) (2025) GEBCO_08 grid, version 20100927. [Available at <http://www.gebco.net>, Br. Oceanogr. Data Cent., Liverpool, U.K
- Osterhage D, MacIntosh H, Althaus F, Ross A (2020) Multiple observations of Bigfin Squid (*Magnapinna* sp.) in the Great Australian Bight reveal distribution patterns, morphological characteristics, and rarely seen behaviour. *PLoS One* 15(11):e0241066
- Schiel S (2009) The expedition of the research vessel Polarstern to the Antarctic in 2007 (ANT-XXIV/1). *Berichte zur Polar- und Meeresforschung. Reports on polar and marine research*, p 592
- Swanborn DJB, Niyazi Y, Gafeira J, Gonzalez BC, Sims HB, Jamieson AJ (2025) Atlantic Fracture Zones Expedition Report. *Inkfish Open Ocean Program*, p 60. <https://doi.org/10.5281/zenodo.15363986>
- Telenius A (2011) Biodiversity information goes public: GBIF at your service. *Nordic J Bot* 29(3):378–381
- Vecchione M, Young RE (1998) The Magnapinnidae, a newly discovered family of oceanic squid (Cephalopoda: Oegopsida). *Afr J Mar Sci*. <https://doi.org/10.2989/025776198784126340>
- Vecchione M, Young RE (2006) The squid family Magnapinnidae (Mollusca: Cephalopoda) in the Atlantic Ocean, with a description of a new species. *Proc Biol Soc Wash* 119(3):365–372
- Vecchione M, Young RE, Guerra A, Lindsay DJ, Clague DA, Bernhard JM, Sager WW, Gonzalez AF, Rocha FJ, Segonzac M (2001) Worldwide observations of remarkable deep-sea squids. *Science* 294(5551):2505

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