

# RECENT OARFISH (*REGALECUS*) SIGHTINGS PRIMARILY OCCUR IN THE REGION OF TECTONIC PLATE BOUNDARIES



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The oarfish (*Regalecus* spp. Teleostei, lampridiformes) is a deep sea fish primarily found from 100-1000m. Although the distribution is wide, samples are rarely found. Most sightings occur when oarfish strand on coastal beaches. There is bias in reporting of oarfish sightings with most sightings (prior to the age of the internet) being reported near to sites of news media and and in the English Language (USA, Australia, South Africa, Japan). Traditionally oarfish have been known as earthquake fish in Japanese indigenous folklore, as they are thought to be sighted before earthquakes. While this association is unproven, data analysed from 1995 onwards show that sightings do occur (more often than would be expected by chance) close to tectonic plate boundaries.

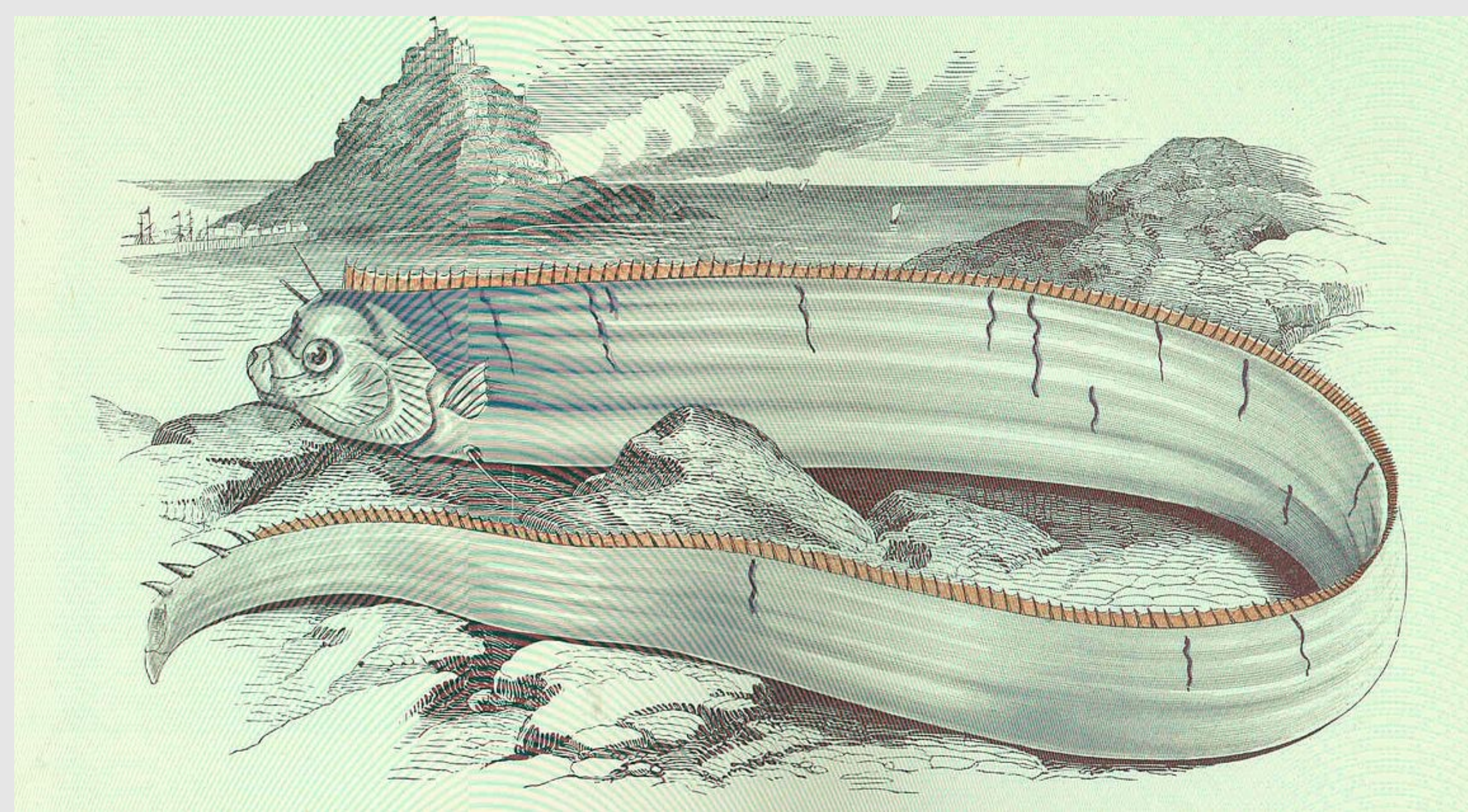
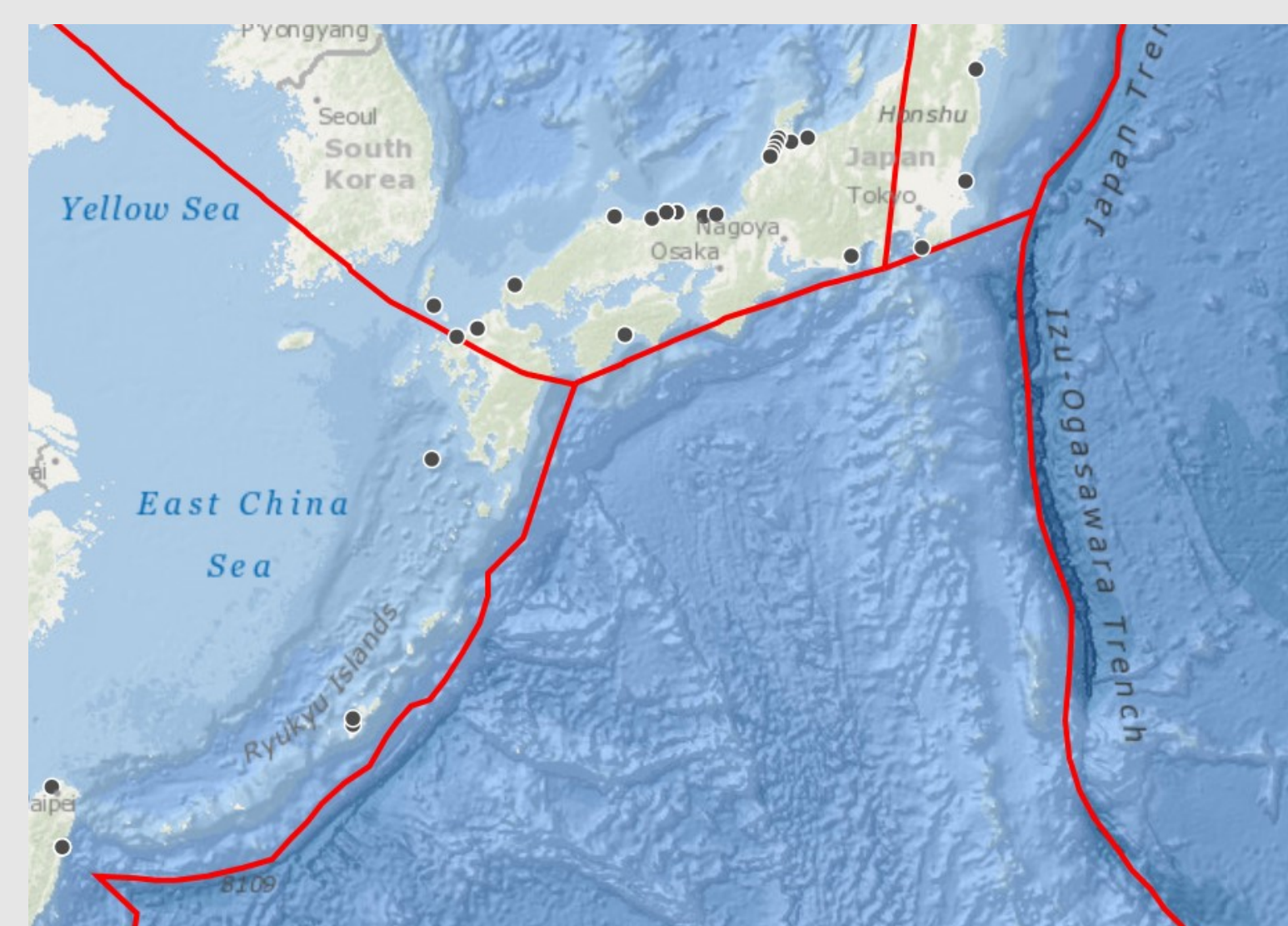
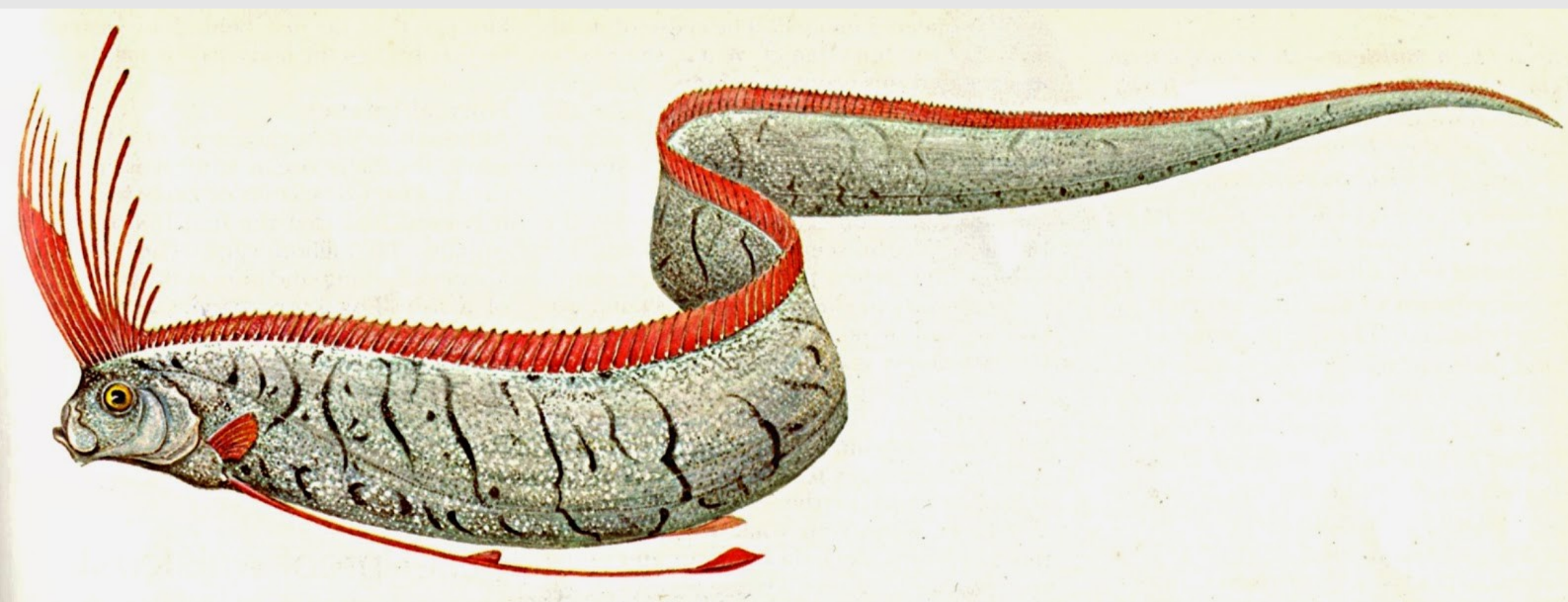


Image courtesy of Marine and Freshwater Image Bank

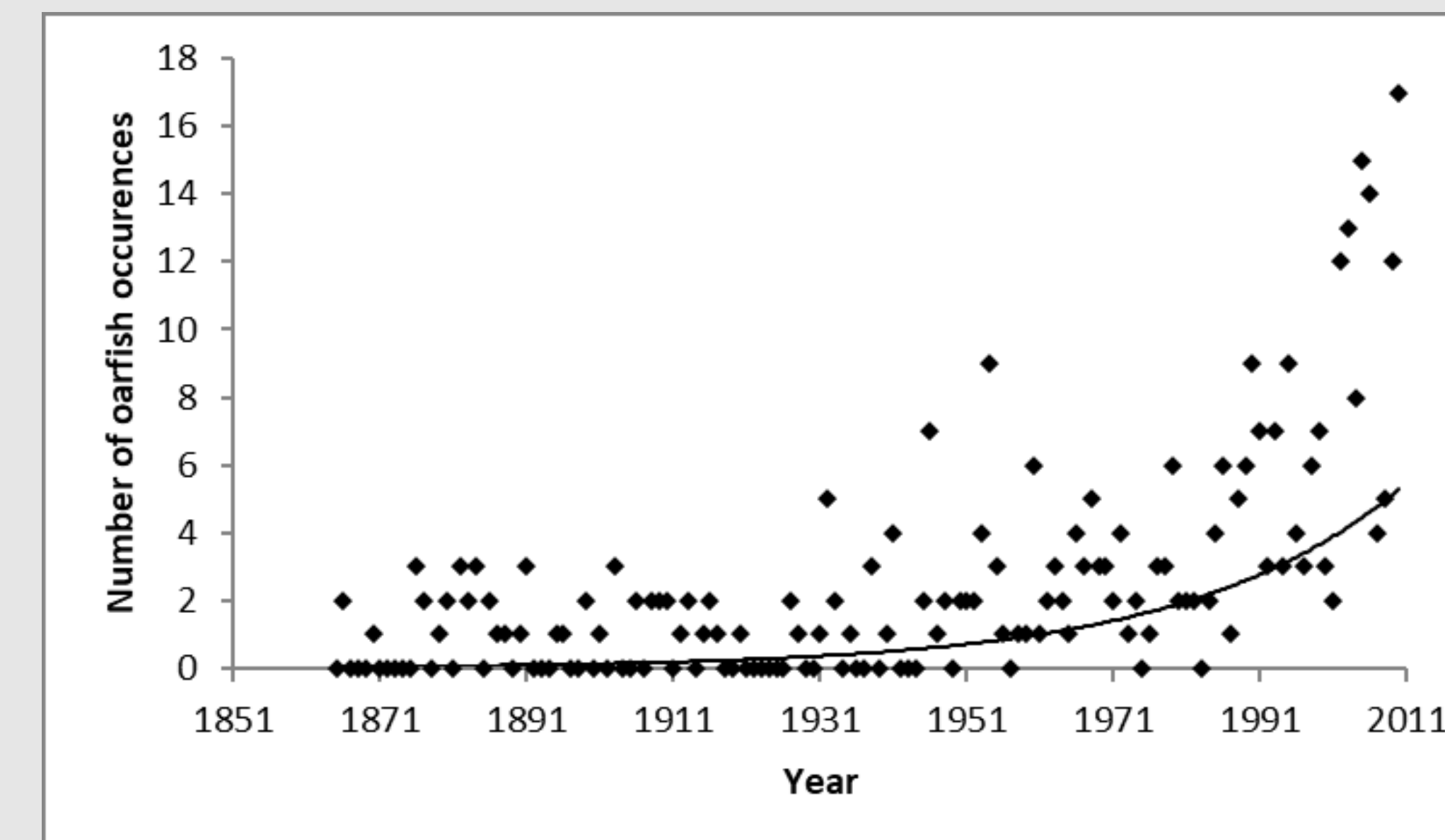
**Methods:** A list of oarfish sightings from 1995 to the present was obtained from various sources including Roberts (2012) and systematic searches of Google and Google Scholar.

For each sighting a geographic coordinate was obtained, co-ordinates were plotted using ARCGIS with an oceanographic base layer and a tectonic boundary layer. Using the measurement tool distances from plate boundaries were measured from each sighting. Thirty random coastal coordinates were used as a control and to generate expected distributions, controlling for the fact that random coastal coordinates do not fall equally into each category but tend to be nearer to boundary regions. The control variables were used to provide ratios for expected chi squared frequencies. 108 oarfish sightings were analysed and the analysis is ongoing as more fish sightings are found.

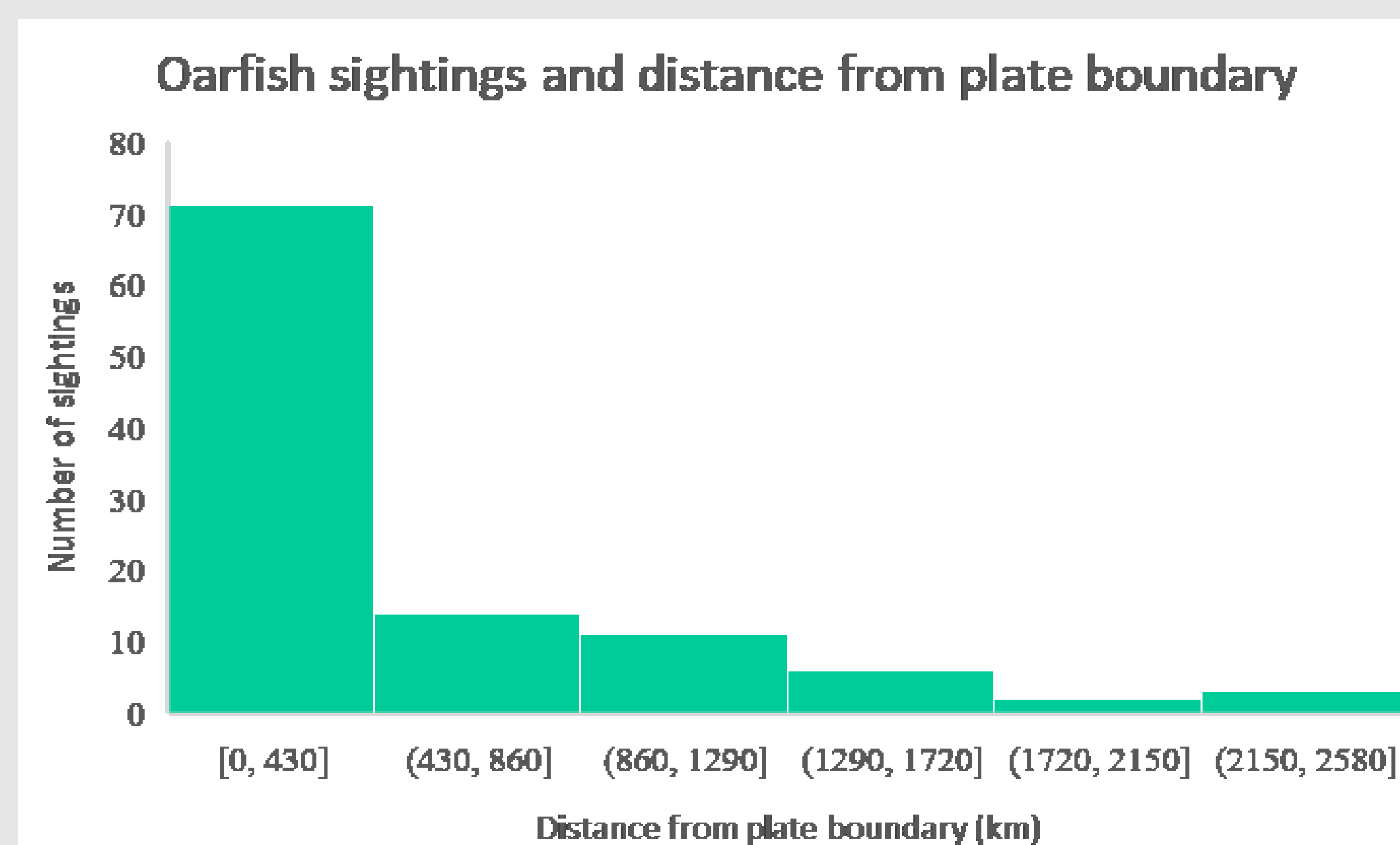
**Results:** preliminary analysis suggests oarfish sightings occur more frequently within 430km of a plate boundary with 65% of sightings occurring within this range and the remaining 35% spread from 430 to 2580 km from plate boundaries. Chi Sq =74.2, DF=5, p<0.001



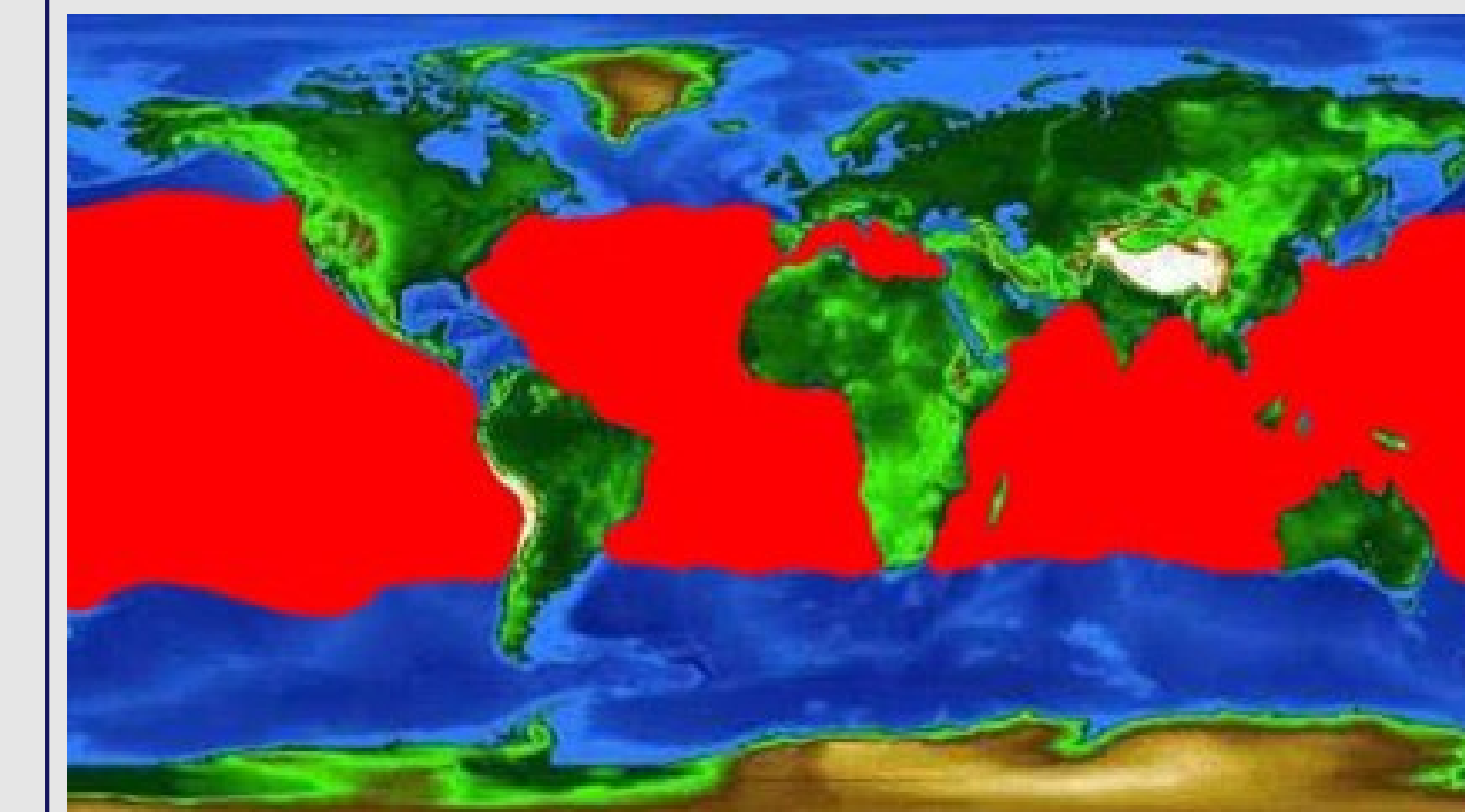
Oarfish sightings Japan and Taiwan areas



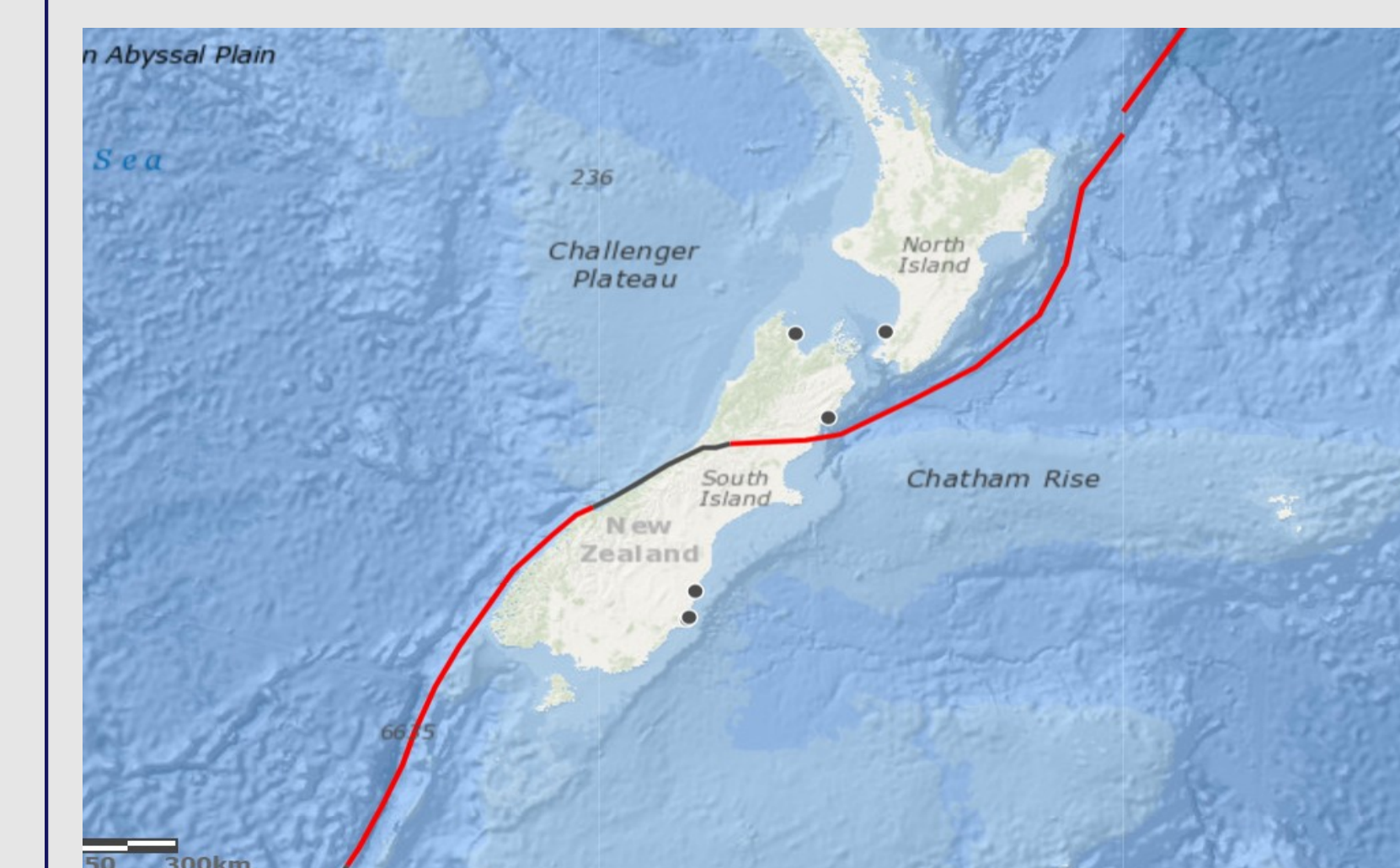
Oarfish sightings from 1851 to 2011 (from Roberts, 2012), showing the exponential increase in sightings since the Internet, which is why we chose to include sightings from 1995. Prior to this, sightings were biased towards locations with reporting media



Number of oarfish sightings 1995 to present as a function of distance from plate boundary



Oarfish range



**Discussion:** The reason for oarfish sighting's association with plate boundary areas is unclear but could be due to several effects

1. Artefact due to more press reporting of sightings in seismic risk areas
2. Oceanographic factors related to plate boundaries such as the presence of deep ocean trenches or ridges
3. Activity in the boundary area such as gasses and charged particles released from faults causing fish to seek shallow water

The association of oarfish sightings with tectonic boundary areas could have given rise to the legend that oarfish are predictors of earthquakes. Further work will attempt to model oarfish sightings to ascertain their utility in short-term EQ predictions. This is currently unknown. In addition to plate boundary regions oarfish are also commonly sighted in Australia and Florida so it is clear that plate boundaries are not the only factor influencing their distribution .

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