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**EXPLORING
PAPERS**

Are we watching the fisheries seaset?



“Exploring papers” are papers on marine themes produced to prompt new reflexions on old themes or introduce new emerging themes or ideas

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1. INTRODUCTION

Narratives that help to understand what the key elements of the reality are, and where we should focus our attention, evolve with time.

In this “exploring paper” we study the evolution on the use of some key fisheries related words in English and Spanish books in the last 150 years as a first proxy of the evolution of the narratives.

To do so we have quantified the presence of a set of more than 20 key fisheries related terms using N-Google Books Ngram Viewer¹ tool, an online search engine that charts the frequencies of any set of search strings using a yearly count of n-grams found in sources printed between 1800 and 2019 in Google’s text corpora in English, Chinese, French, German, Hebrew, Italian, Russian, or Spanish. It is a tool that is increasingly being used in social research due to its easy access, analysis and the huge amount of available information - including more than 5 million books now- (Michel et al., 2011). We will use the English 2019 corpora as a basis, and the Spanish 2019 corpora to compare the coherence of the conclusions.

¹ https://en.wikipedia.org/wiki/Google_Ngram_Viewer

2. ANALYSIS

Marine, ocean and Sea interest

To have a broad picture first we can analyse the interest in marine, ocean and sea using “marine” “ocean” and “sea” word presence in English literature. A smooth decreasing trend can be observed until the 1920s, followed by a stabilization with some fluctuations including a very slight increase more recently. A similar pattern can be observed in the Spanish corpora using “mar” “océano” and “marino”.

Figure 1 Sea, marine, ocean

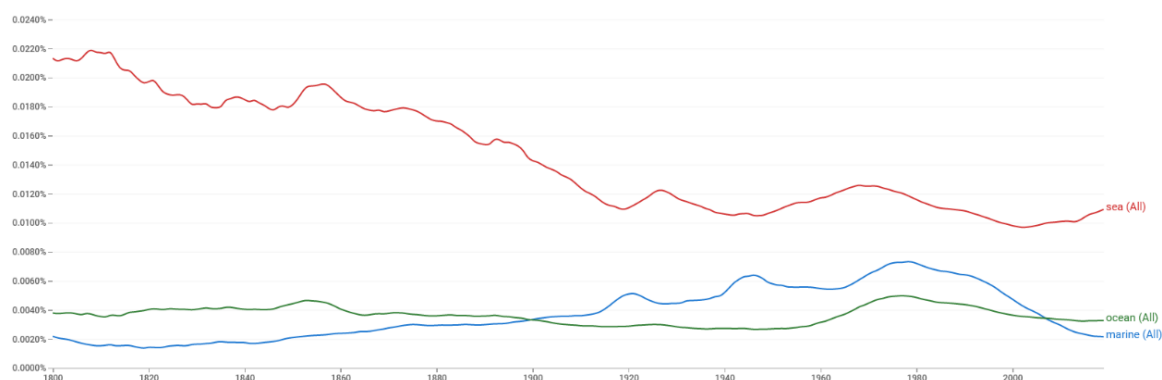
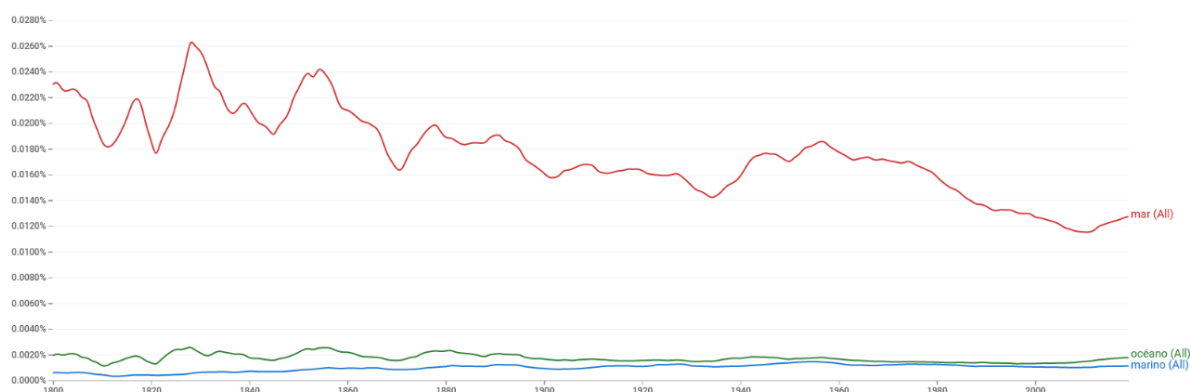


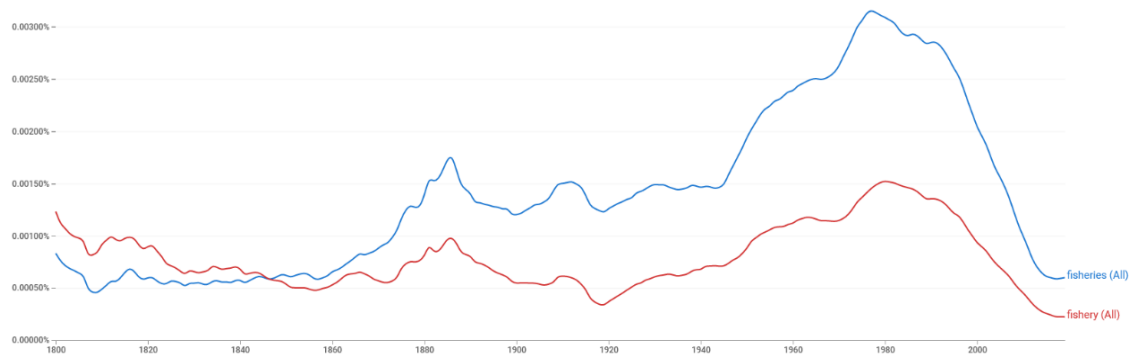
Figure 2 Mar, océano, marino



Fisheries

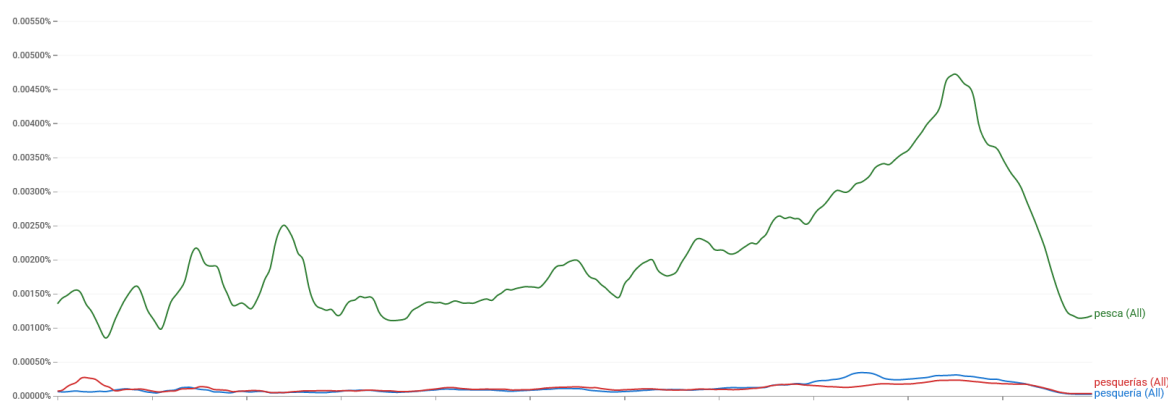
If we focus on fisheries. The analysis should start by both “fisheries” and “fishery” words. A clear and sharp decrease in interest can be found since 1977, with a clearer fall since 1992 and a plateau in the last three years. This sharp fall shows a clear fall in interest in fisheries narratives, and it is clearly something to be taken into consideration for all interested stakeholders.

Figure 3 Fisheries, fishery



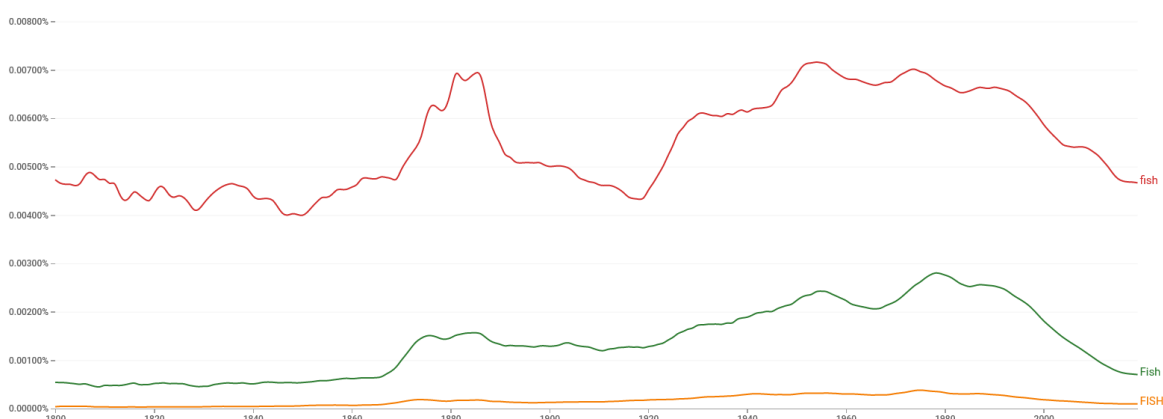
Using the Spanish words “pesca” “pesquería” “pesquerías” a similar trend can be observed.

Figure 4 Pesquería, pesquerías, pesca



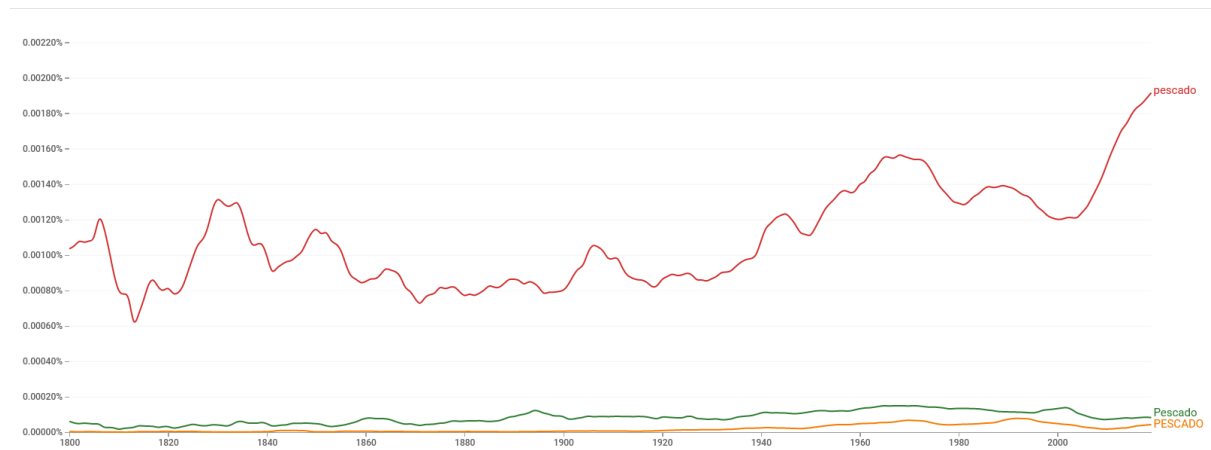
It is interesting to note that if we use the concept “fish” in English a softer decreasing trend can also be found since the beginning of the 90s.

Figure 5 Fish



Which is not the case in Spanish when we look at the word “pescado”. Here we can observe a clear different trend between both “book presence”.

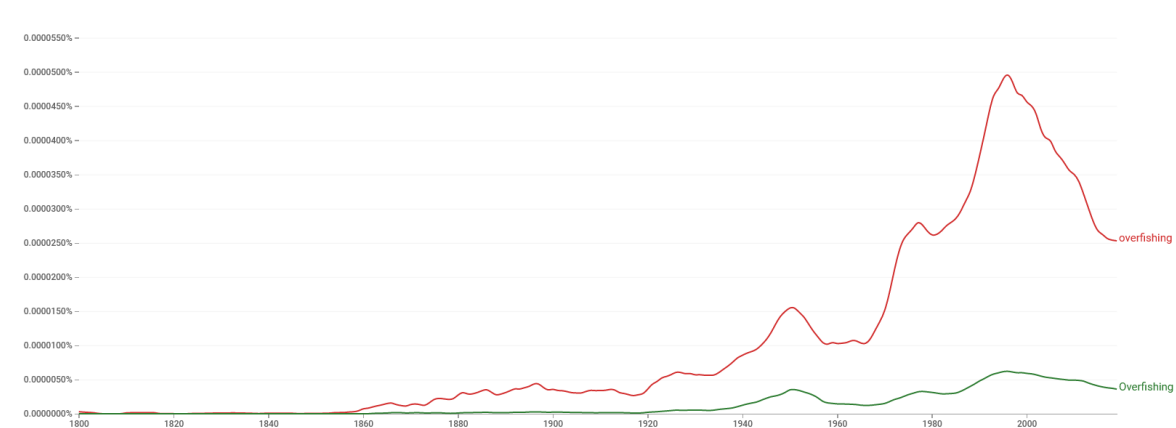
Figure 6 Pescado



Overfishing

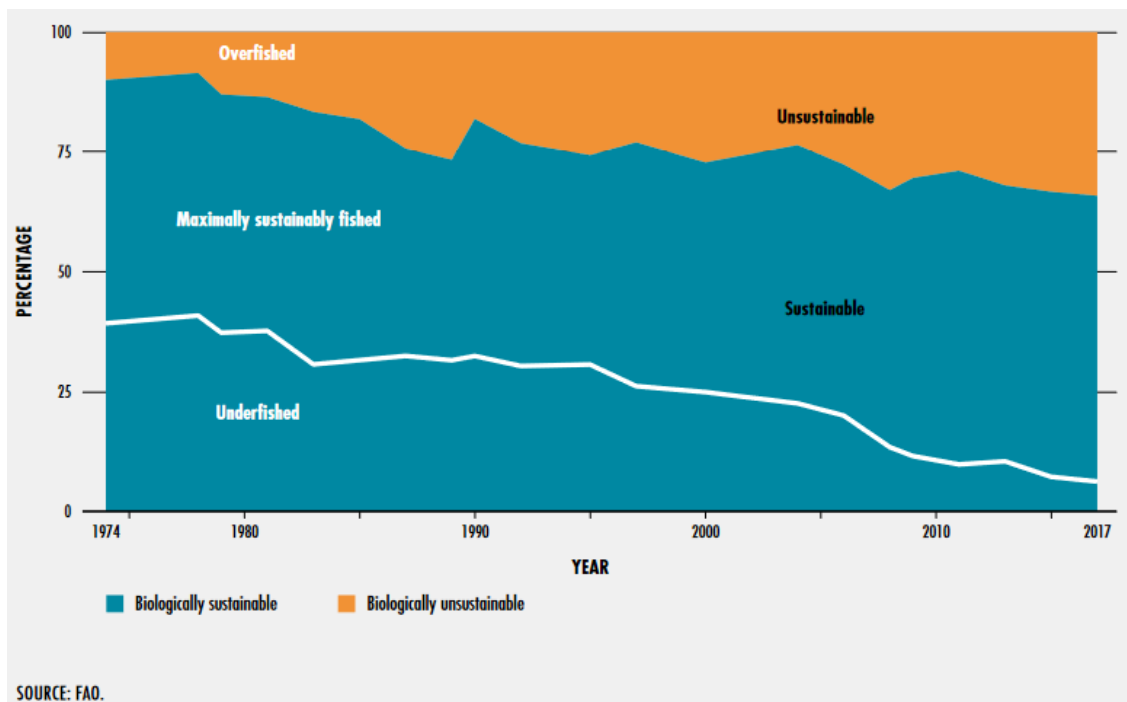
Results of analysing “overfishing” are also interesting. A very clear downward trend can be observed since 1996.

Figure 7 Overfishing



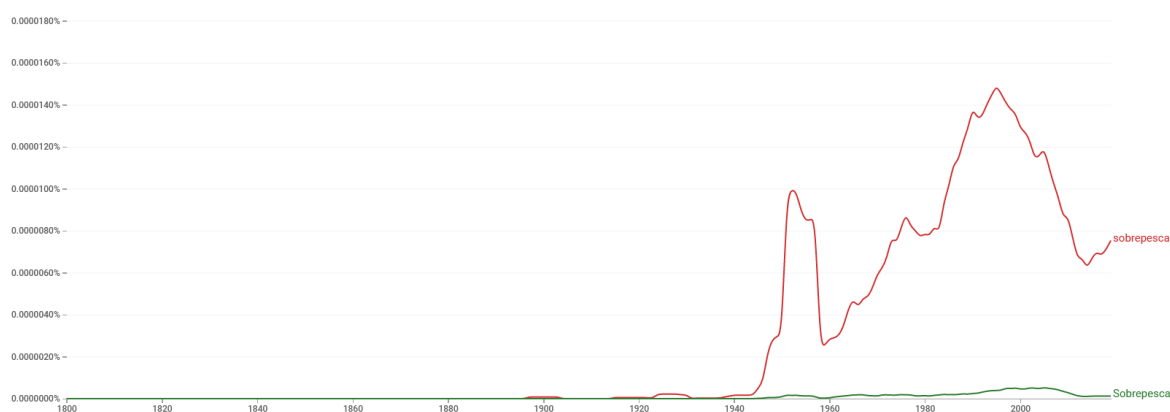
That seems to suggest that the overfishing narrative is losing momentum even if the problem is getting worse according to the official figures. The decoupling of narratives interests and objective data is not specific for fisheries and has happened in other fields in the past. Nevertheless, it is of course something to be considered.

Figure 8 Global trends in the State of the World's Marine Fish Stocks, 1974-2017



In the Spanish case using “sobrepesca” globally similar results are obtained also, with a maximum use in 1995 and a slight increase of interest in the last six years. Again, in the Spanish-language context it seems to be an increase of interest in the more recent years.

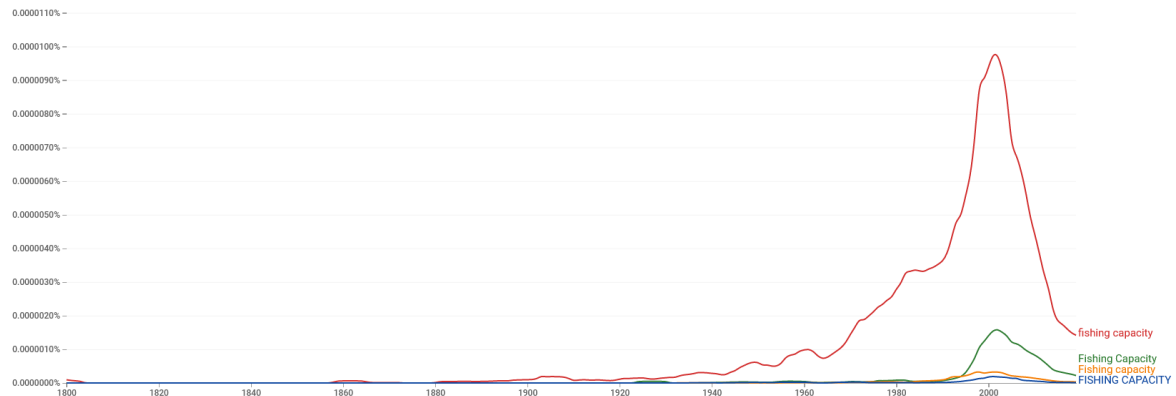
Figure 9 Sobrepesca



Fishing capacity

If we analyse the “fishing capacity” concept similar results to overfishing can be observed with a clear maximum in 2000 and a strong decrease since then. This result is coherent with previous information since overfishing and overcapacity are related concepts.

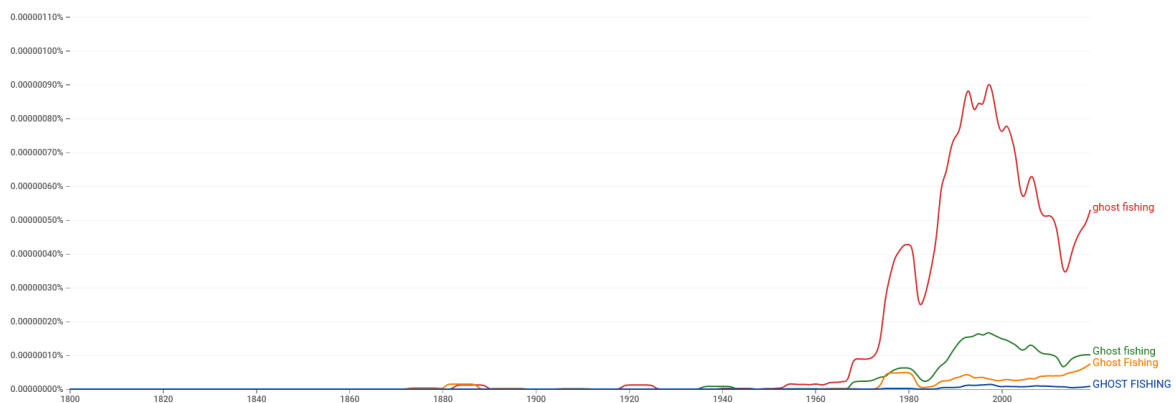
Figure 10 Fishing capacity



Ghost fishing

It is interesting to note that this concept has had three “waves” of attraction, the first one was at the end of the 70s (as many other fisheries-related concepts), a second one in the 1990s (when FAO adopted it as a relevant issue for good fisheries management) and for the last five years we are again in a third wave of interest. It is also worth noting that its equivalent in Spanish “pesca fantasma” cannot be analysed due to the very few presence (less than in 40 books) in the corpus covered by Google Ngram.

Figure 11 Ghost fishing



IUU fishing, IUU, Illegal Unreported and Unregulated fishing, Illegal fishing

In this case two waves can be observed in relation to the IUU concept, one in the 2000s and a second one still growing that started in the 2010s. It is interesting to note that a previous wave of interests could be found at the start of the 1900s under the concept of illegal fishing.

Similar results can be found in the Spanish language.

Figure 12 IUU

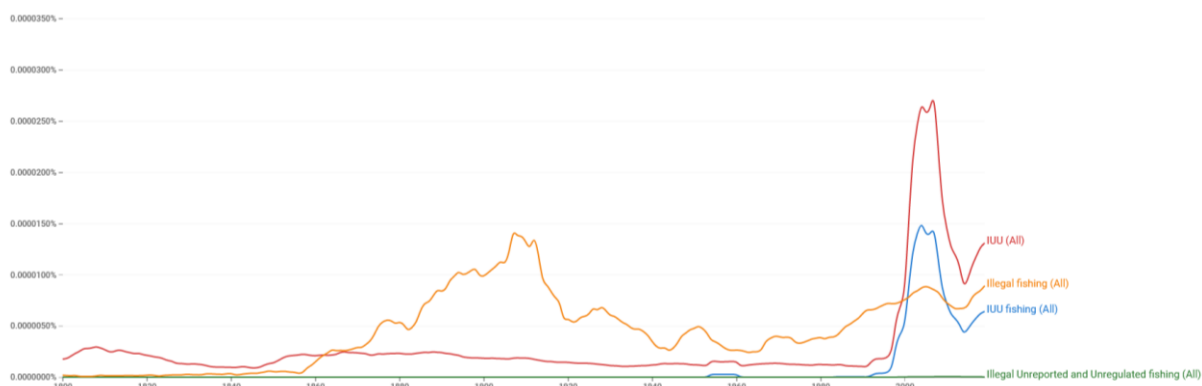
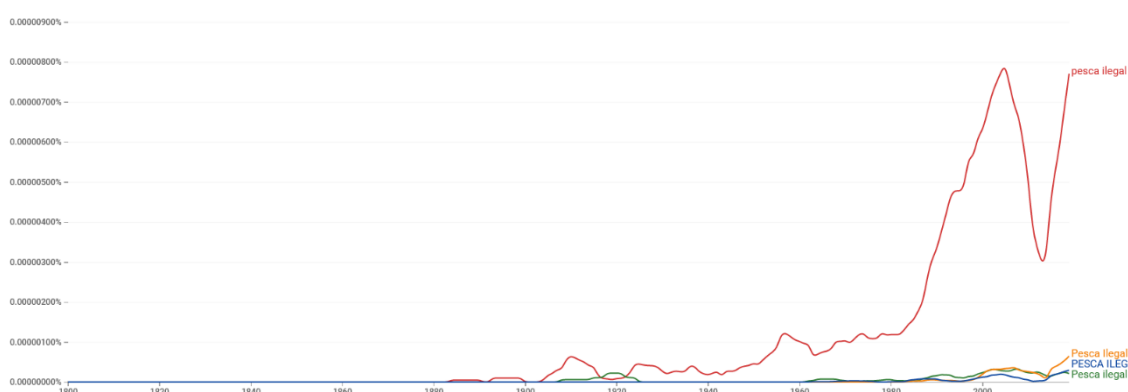


Figure 13 Pesca ilegal



Bottom trawling, trawl fishing, fishing trawler, bottom-trawl fishing

The analysis of trawl related concepts is more complicated because the relative relevance of various similar concepts changes with time. Nevertheless, a slight increasing trend seems to emerge. The pattern is quite different in the Spanish-language community where much attention was paid in the second republic period, before the 1936-39 war, and since the 1950s to the start of the 1990s. Since then, the public interest has clearly decreased.

Figure 14 Trawl related concepts

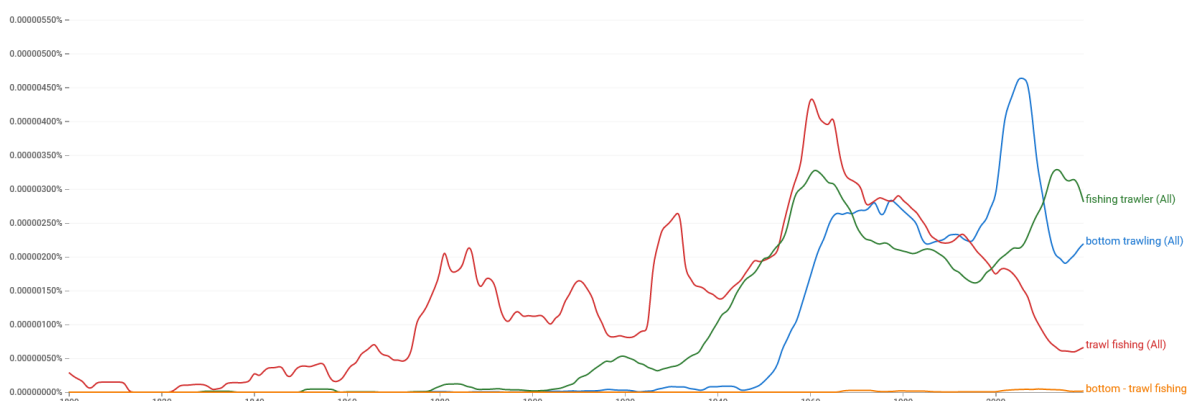
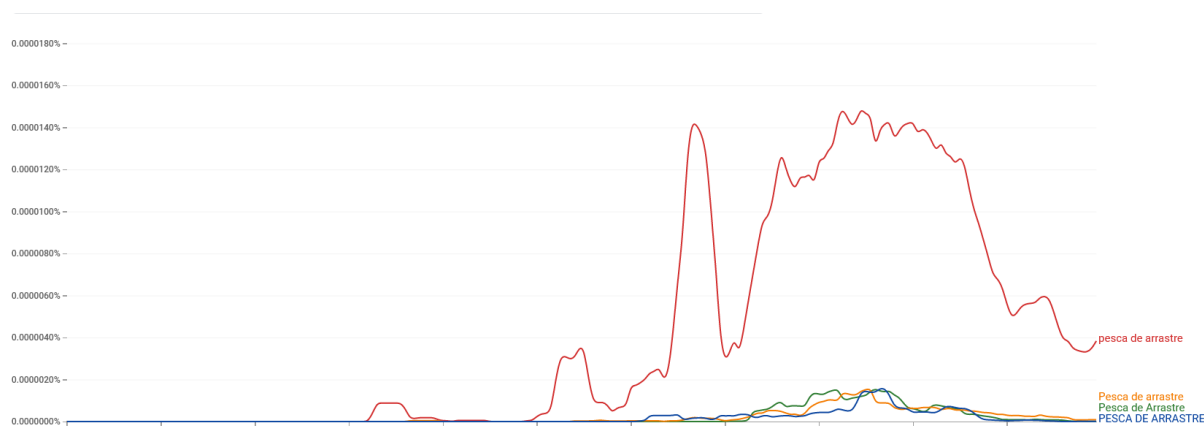


Figure 15 Pesca de arrastre



Aquaculture

Aquaculture production has clearly increased in the last 40 years (Figure 16). Following this growth, a clear increase in its presence in literature both in English and Spanish can be observed (Figure 16, Figure 17). Interest wanes at the start of the 2000s and increases again in the last decade.

Figure 16 World Capture fisheries and aquaculture production

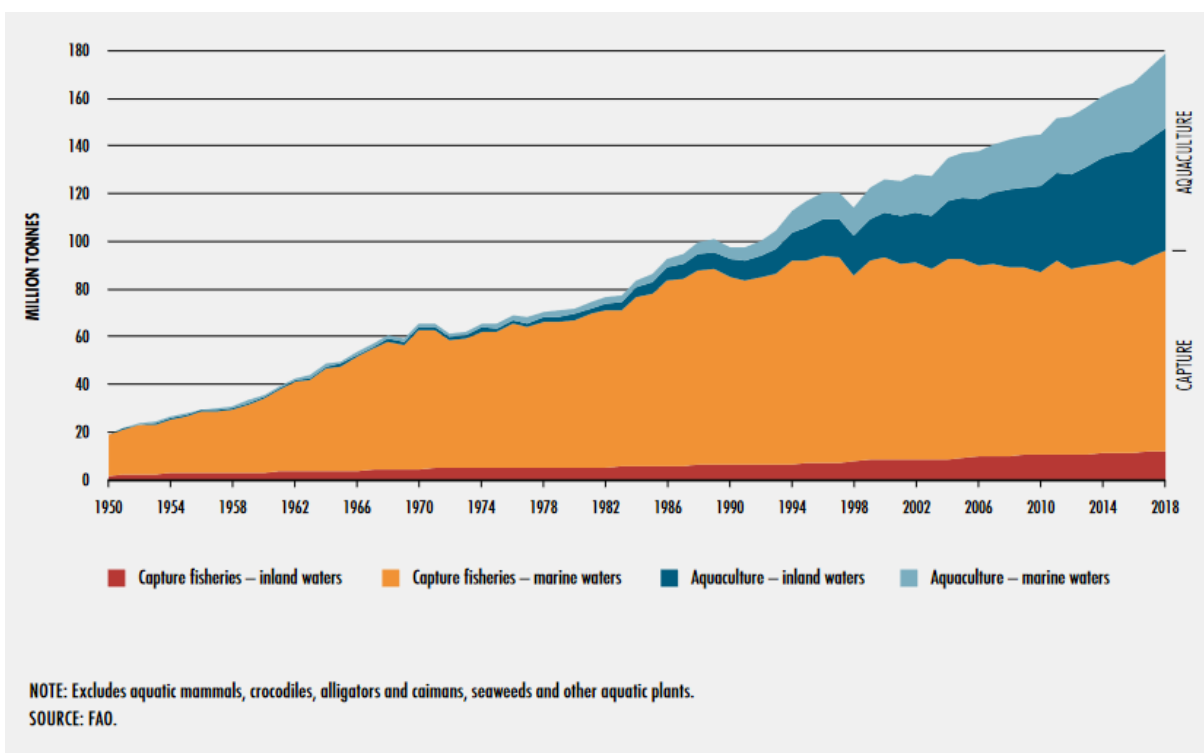


Figure 17 Aquaculture

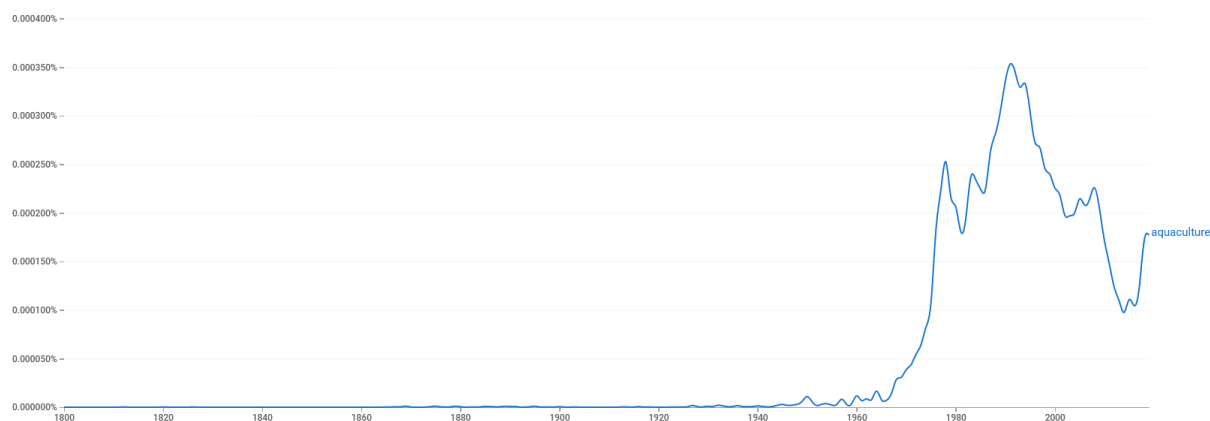


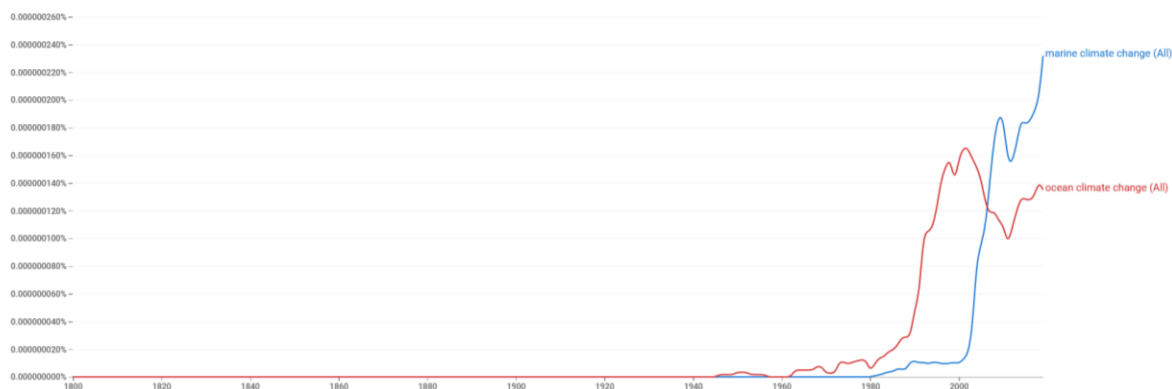
Figure 18 Acuicultura



Marine and climate change

Of course, not all the concepts of interest to those working in fisheries are decreasing. Climate change is one of the “hot topics” in public interest all over the world. If we focus our attention on “marine climate change” or “ocean climate change” we can observe a clear increase in their use in the last two decades.

Figure 19 Marine climate change, ocean climate change



In the Spanish case if we use concepts such as “cambio climático en el mar” o “cambio climático en los océanos” there is not enough data to be analysed.

More interesting is that concrete effects of climate change on the sea are more popular than the overall concepts, in particular “sea level rise” (or the Spanish equivalent “aumento del nivel del mar”) and “ocean acidification” are clearly having a momentum in the last decade. In the case of “sea level rise” it was also a popular concept in the 90s, whilst “ocean acidification” is a much newer concept in the general narrative.

Figure 20 Sea level rise, ocean acidification

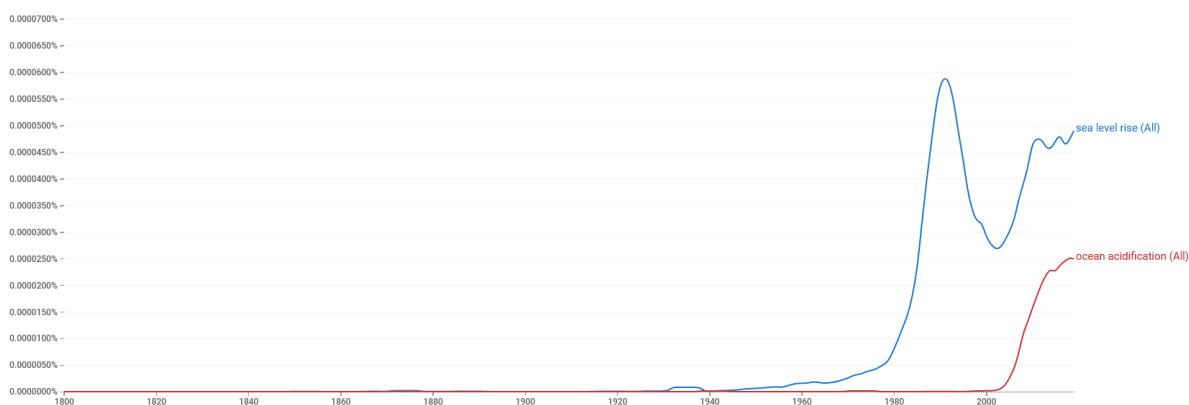


Figure 21 Subida del nivel del mar, acidificación oceánica



Marine biodiversity

We have analysed both “marine biodiversity” and “ocean biodiversity”. It can be observed that “marine biodiversity” is much more popular.

In this case it is interesting to note that a very clear trend of increasing use is taking place. Moreover, if we compare the shape of the curve with the much more popular and general “biodiversity” concept they are quite different. We can observe a major increase in interest for marine issues in recent years whilst the “Biodiversity” curve has a clear maximum in 2002, and a decreasing period until 2013 where the level of interest remains stable until the last two years where a small increase takes place.

Figure 22 Marine biodiversity

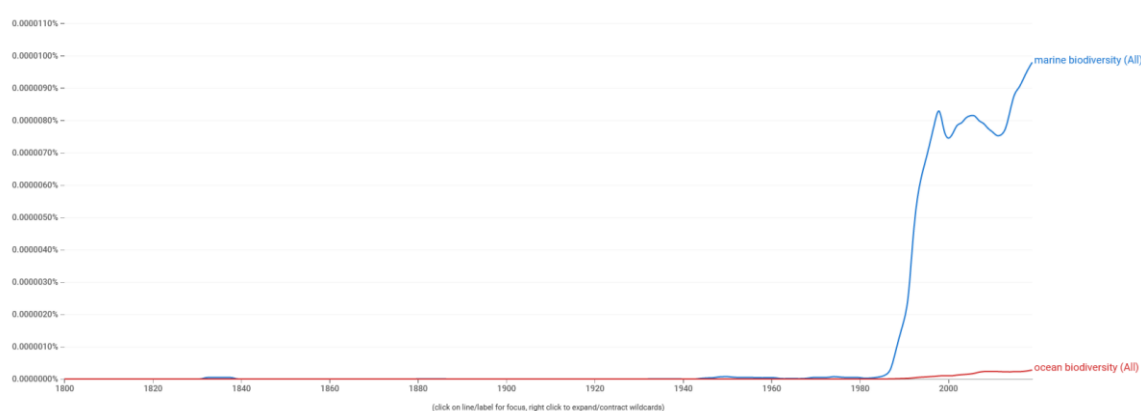
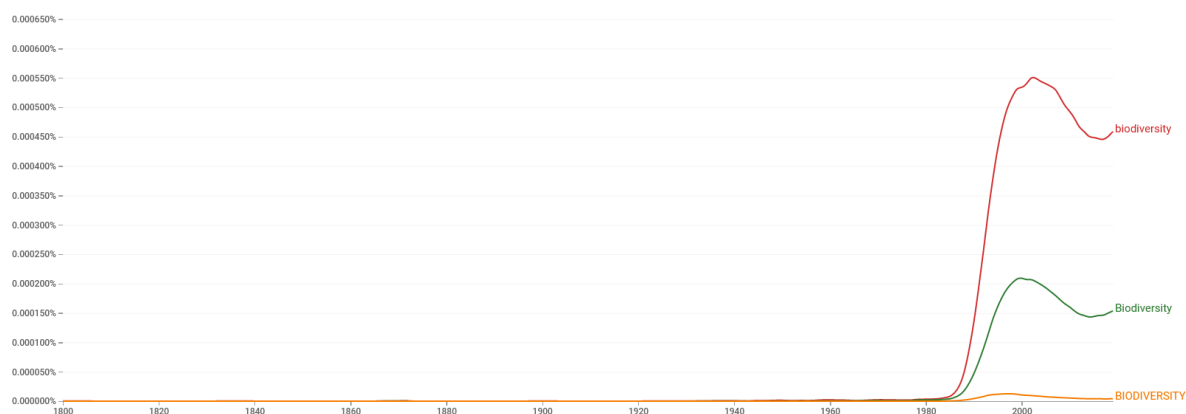
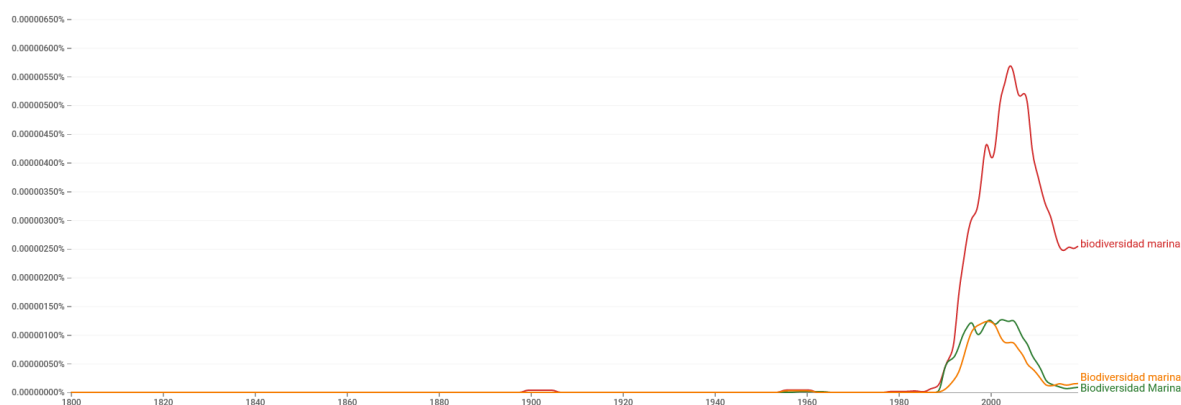


Figure 23 Biodiversity



It is also worth noting that in Spanish literature trends are quite different, with “biodiversidad marina” (marine biodiversity) losing relevance in the decade 2004-2014 and only in the last three years being somehow stabilized. This shape is very similar to the broader “biodiversidad” concept.

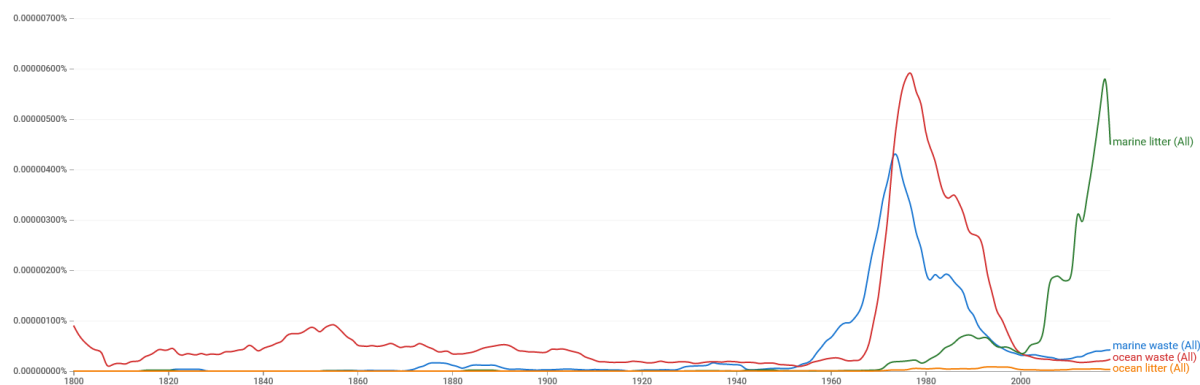
Figure 24 Biodiversidad marina



Marine litter, marine waste, ocean litter, ocean waste

In this case it is interesting to note the change from “marine waste” to “marine litter” concept. Two clear waves can be observed, the first one in the 1970s where most of the more relevant ecological movements put this issue on the agenda and were focused on “marine waste” whilst after twenty years of decreasing interest a new wave of interest has appeared in the last decades linked to the concept of “marine litter”.

Figure 25 Marine litter, marine waste, ocean litter, ocean waste



Concept comparison

While it is interesting to analyse each concept, some relevant information can be obtained also if we analyse what is the relative importance of all of them between each other.

In general, we can observe that those linked to climate change (sea level rise, and ocean acidification) clearly are on an increasing trend and are even more popular than those strictly linked to fisheries, while overfishing is decreasing its relevance but remains a powerful narrative. Finally, IUU fishing is clearly at a lower level but it is increasing, the same as marine biodiversity and marine litter.

Figure 26 Comparison between some of the more relevant concepts

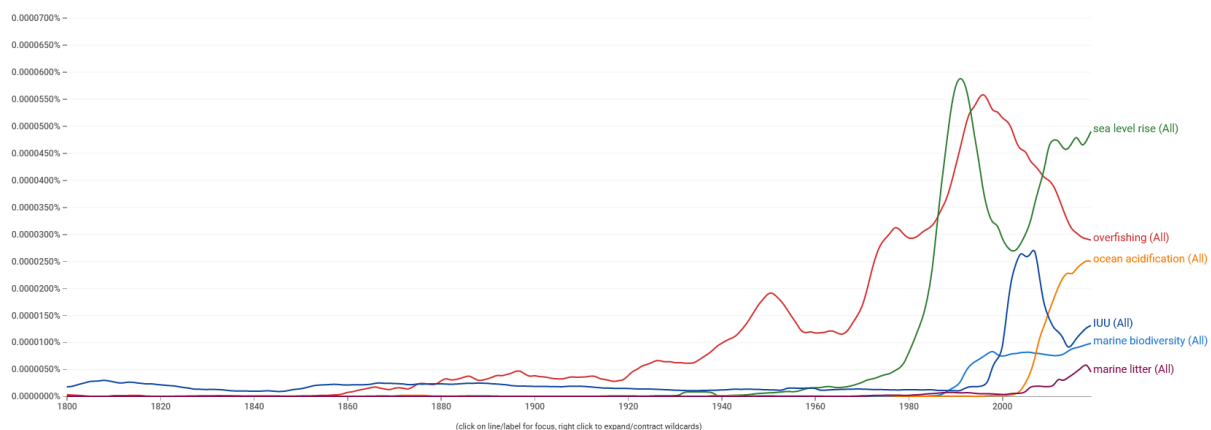
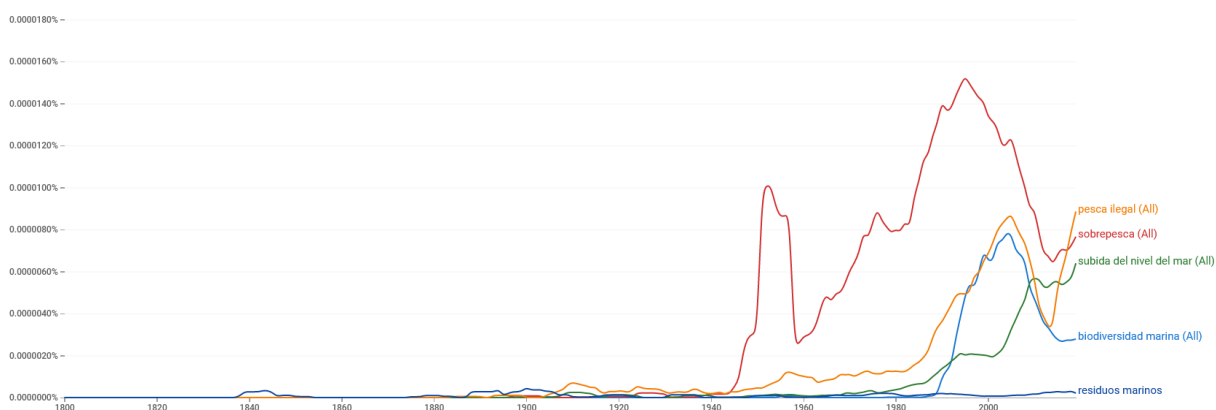


Figure 27 Comparison between some of the more relevant concepts in Spanish



3. CONCLUSIONS

This preliminary assessment shows a decreasing trend in the use of most of the fisheries related concepts in the last decades.

A decreasing trend in their use should be considered as a warning signal for all fisheries stakeholders because it may suggest at mid-term disengagement of public interest, that may lead to a decreasing interest of public administrations in a context where changes in fisheries practices are needed to ensure a sustainable management of the marine resources.

The decreasing use of “overfishing” concept is especially worrying because according to the scientific information available the problem is far from being solved.

On the other side of the balance some concepts related to climate change in the marine context are gaining momentum and in fact they have already surpassed in relevance those specific to fisheries.

Other marine relevant issues such as IUU fishing, marine biodiversity or marine litter are also increasing their presence (or recovering from downward trends in some cases) but they are still far from overfishing or marine climate change related concepts.

Finally, it is interesting to note that some differences between the English and Spanish literature can be found, e.g. the research suggests that climate change marine concepts still have a lower level of relative presence in Spanish than in English.

4. ANALYTICAL LIMITATIONS

This analysis should be considered as a preliminary approach to a long-term narrative trends analysis, and it does not include any changes produced after 2019, i.e. COVID crisis, if any.

A deeper analysis of the detected tendencies may include among others the use of other sources of information such as internet communication media or journals of the last decades, statistical analysis of the current available information, analytical aggregation of concepts, and regional approaches that may also be relevant to understand the trends at local level.

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