

Representation of the sea by HMG: Strategies for communication

16

CASS

Corpus Approaches
to Social Science

CASS: Briefings

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About CASS...

The ESRC-funded Centre for Corpus Approaches to Social Science (CASS) is a research centre based at Lancaster University which aims to bring the methods and benefits of the corpus approach to other disciplines and policy makers.

From the Centre Director

The corpus approach harnesses the power of computers to allow analysts to work to produce machine aided analyses of large bodies of language data - so-called *corpora*. Computers allow us to do this on a scale and with a depth that would typically defy analysis by hand and eye alone.

In doing so, we gain unprecedented insights into the use and manipulation of language in society. The centre's work is generating such insights into a range of important social issues like climate change, hate crime and education. This series of briefings aims to spread the social impact and benefits of the work being done by the centre and, in so doing, encourage others to use our methods in future.

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Enhancing public perception of the sea requires targeted communication strategies based on an analysis of current representations of the sea and their bias. The project provides a systematic account of the way the sea is represented by HMG by applying corpus linguistic methods to the analysis of .gov textual production. Our findings point to:

- **Utilitarianism and weak sustainability:** Although the need to protect the marine environment is present, the dominant narrative centres on economic benefits. The sea is valued, and it needs to be protected but mainly from an economic, utilitarianist perspective.
- **Discourse of danger:** The sea is represented as in danger, in need of protection, but 1) the main rationale is not moral but economic (e.g., risk of depleting fish stocks entailing negative economic impacts), and 2) the sea itself is a source of threats for human beings (notably via sea level rise) as opposed to the human cause of sea level rise via climate change effects.
- **Territorialization of the sea:** The need for security and stability in the maritime domain is supported by a territorialization discourse that calls for more control and governance at sea.
- **Lack of emotion and managerial discourse:** The economic, weak sustainability and territorialization discourses are all underpinned and reinforced by a bureaucratic and managerial discourse that represents the sea in technical terms. This is thus not surprising to see very few instances of emotional representation in the discourse.

Recommendations:

- **Valuing the ocean through emotions:** Ocean citizenship requires a degree of connection to the sea that the existing narrative does not convey. Current communication on the sea can only serve an agenda of economic development and at best of weak sustainability. The narrative around the sea is too much utilitarian/opportunistic and not emotional enough. We recommend prioritising public policies and narratives that contribute to connect people and the sea in an emotional (versus utilitarian) way.
- **Highlight the benefits of the marine environment:** It is important to define and describe the positive aspects of the sea and what it is we are specifically trying to protect. Through this, more positive emotions and evaluation of the sea can be imputed into the narrative.
- **Incorporate more hopeful narratives:** Prominent discussions of 'threats' and 'dangers' encourage worry, rather than hope. Worry can encourage climate action but too much can be debilitating and encourage apathy; it is important to simultaneously provide 'hope' to communicate to both engaged and disengaged audiences. In particular, 'rising sea levels' portrays the sea as an agent of climate change, rather than the victim. Emphasizing the anthropogenic causes of climate change can re-establish the sea as being the entity to protect.

Why investigate?

This is a project on public awareness of the sea. Ocean sustainability is contingent to citizens' awareness of "the benefits they receive from the marine environment" ([DEFRA](#), 2021, p.4). However, 'sea blindness' is still dominant in Britain ([Germond-Duret & Germond](#), 2023), and the sea is at the bottom of the list when it comes to public perception of global environmental issues ([Potts et al.](#), 2016).

Enhancing public perception of the sea requires targeted communication strategies based on a critical analysis of current representations of the sea and their bias.

The project aimed to provide a systematic account of the way the sea is represented by HMG by applying corpus linguistic methods to the analysis of .gov textual production.

Data shows that, although the need to protect the marine environment is present, the dominant narrative centres on economic benefits, and there is a lack of emotional vocabulary linked to the sea. We thus recommend prioritising public policies and narratives that contribute to connect people and the sea in an emotional (versus utilitarian) way.

Research questions

- How is the sea represented in HMG's recent textual productions (2010-2023)?
- To what extent is the sea represented in purely technical, economic, and opportunistic terms as opposed to emotional and identity terms?
- How can our findings inform future communication strategies to improve ocean citizenship?

This research involved the collection of an amount of textual data that was too large to be analysed manually:

- We collected every HMG webpage containing either the words 'sea', 'marine', 'maritime', 'ocean' or 'navy' published between 2010 and 2017 and 2018 and 2023.
- In total we analysed 19,656 webpages and over 13 million words. All texts were collected via the .gov portal.

Such large corpora are impossible to analyse by hand, so software packages are used to study them (e.g., to find patterns of representation). We used analytical techniques associated with the field of Corpus Linguistics (the computer-aided analysis of large language data sets, known as 'corpora') to study HMG's dominant narratives.

Corpus linguistic methods make it possible to analyse the data both quantitatively (for example, by using tailor-made software tools to identify the words that tend to occur around 'sea') and qualitatively (by looking at the use of selected instances of 'sea' in context).

To provide an overview of the most distinctive linguistic characteristics of the corpora, we carried out 'keyword' analyses. Keywords are words that are more frequent in a corpus of interest than they are in another corpus, where the difference is statistically significant. They can be interpreted as reflecting the most distinctive concepts and themes in a particular corpus.

Keywords were interpreted by examining their 'collocations'. Collocation analyses explore co-occurrence relationships between words, and therefore makes it possible to study the narratives or discourses that a word is part of.

1. Economic discourse

Findings show a prominent discourse around **fish and fishing**, with top collocates of 'sea' as a common noun including 'trout',

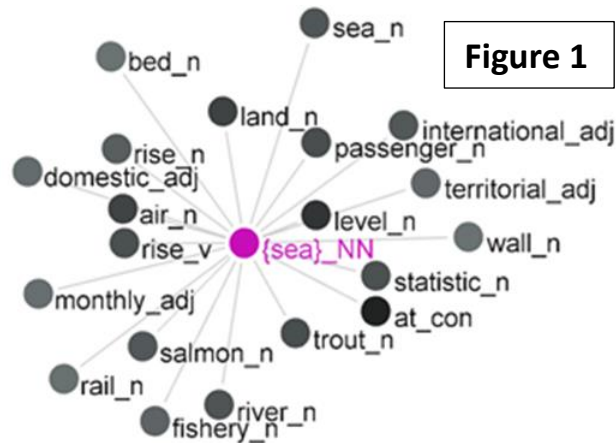


Figure 1

'salmon' and 'fishery' (Figure 1). A concordance analysis then reveals a close link to the collocates 'monthly' and 'statistics', reflecting the **quantification of fish 'stocks' and the need to protect**

stocks found in many examples:

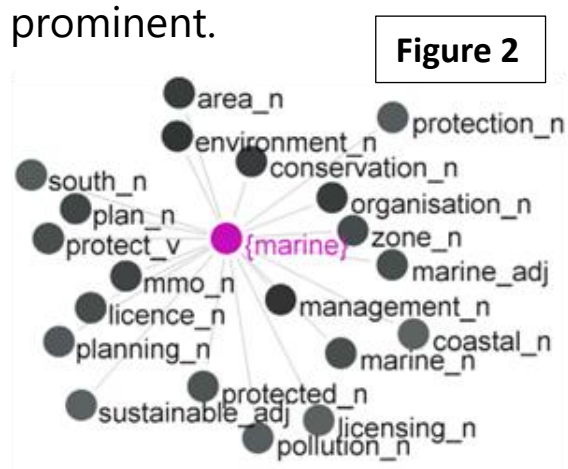
"Jon Shelley, Environment Agency Senior Fisheries Specialist, said: 'The decline in the numbers of both salmon and sea trout is of great concern'" (2022-05-17)

"The proposed new regulations are designed to protect salmon and sea trout stocks in the River Severn as well as those stocks on the River Usk and Wye..." (2021-03-08)

The term 'stock(s)' was a strong collocate with salmon and sea trout, further showing how these fish are construed as a useful resource. We see a similar focus on resources when we look at when 'sea' is used as a proper noun. 'North' is the strongest collocate here by far, relating to the 'North Sea'. Collocates of the 'North Sea' include 'cod', 'haddock', 'oil', 'gas', 'deal' and 'stocks', which again highlight a focus of the sea as a provider of resources.

Looking at the collocates for 'marine' and 'maritime', we also see an embedded **economic and managerial discourse**. We see frequent close collocates of 'licence', 'licensing', 'management' and 'organisation' for 'marine' (Figure 2); and 'industry', 'shipping', 'transport', 'labour' and 'organization' for 'maritime'

(Figure 4 below). This hints to a managerial discourse and shows that the **questions of movement and control** of resources is prominent.



The collocates of 'land', 'air', 'rail', 'passenger' highlight another particularly prominent economic discourse surrounding the 'sea', that of **transport**. We often see phrases bundling the sea with other geographical terms and

transport domains such as 'land, air and sea':

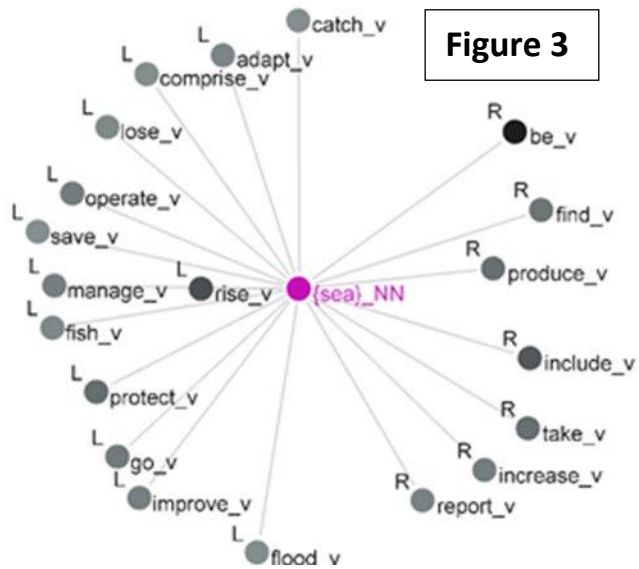
"Relief is available for road, rail, air, sea and inland waterways transport" (2023-03-10)

A look at 'sea', when used as a proper noun, also reveals this transportation discourse through the collocates of 'traffic' and 'seafarers'. Collocations for 'at sea' include 'seafarers', 'yacht' and 'powerboat' and frequent discussion about 'life at sea', and 'solas' (Safety of Life at Sea). This again shows the transportation discourse, but also there is clearly **some concern for life at sea**, with collocates such as 'safety', 'wellbeing', 'armed', and 'robbery'. This fits with the argument that maritime economic activities are dependent on a safe and secure environment to assure business continuity and investment ([Germond-Duret & Germond, 2023](#)).

In sum, from an economic discourse perspective, the two most frequent representations are around *sea as a source of fish* and *sea as a means for transportation*.

2. Discourse of threat and danger

There are frequent discussions of the rising sea level. Figure 1 (above) shows that 'rise' and 'level' are two of the strongest collocates for sea. Verbal collocates such as 'operate', 'go', 'fish', 'produce', 'report' and 'manage' all corroborate the prominent economic discourse (Figure 3). But we see that **'rise' is indeed the strongest collocate**. We also see 'flood', 'save', 'lose' and 'adapt', all of which appear to contribute to a discourse which frames the sea as a threat as a result of climate change-induced sea level rise:



"keep the community safe from flooding from storms and rising sea levels" (22-03-2019)

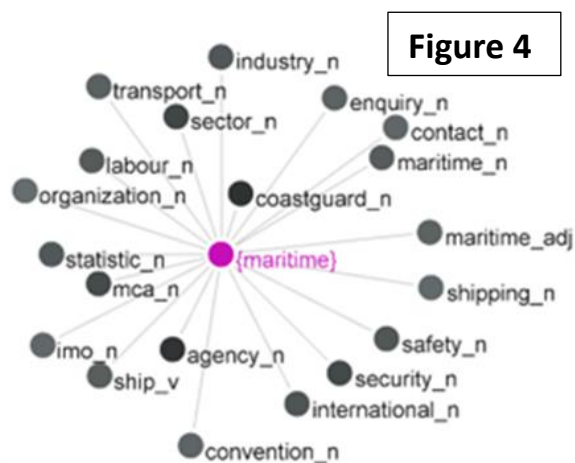
"what needs to be done to manage flood risk and adapt to rising sea levels in Barnes and Kew" (19-04-2023)

Crucially, the discourse of threat is about the rising sea levels threatening life, rather than the sea itself being threatened. **There is a discourse that emphasizes the threat of sea level rise, but this is not leading to a discourse about the need to protect the sea.**

The collocate 'protect' may suggest that there is, at some level, a discourse about protecting the sea. However, protection concerning the sea is only a minority: 8 out of 86 uses of 'protect'. Instead, **there is more attention on protecting sea trouts and building sea defences**. This highlights that economic concerns

around fish stocks, and the dangers of a rising sea level, dominate the discourse, which corroborates finding around the economic discourse.

There is also a **discourse of danger**. As shown in the previous section, 'life at sea' is depicted to be dangerous, and this is also found in the collocates 'save' and 'lose'. Similarly, the top collocates of 'maritime' include the very frequent 'coastguard', as well as 'safety' and 'security' (Figure 4). This shows that there is a clear depiction of the sea as dangerous that fits with previous research findings ([Germond-Duret & Germond, 2023](#)). The sea is framed as a threat to people, rather than people as a threat to the sea. And the maritime economy is constructed as dependent on a safe and secure environment.



3. Territorialization discourse

The narrative emphasises the notion of **sovereignty and jurisdictions**. Despite the fluid, liquid nature of the sea, many descriptions of the sea located it in a certain area or owned by a certain nation. Top collocates of 'sea' as a common noun showed the adjectives "international", "territorial" and "domestic" (see Figure 1 above). The term 'sea' is often used to describe 'locations', i.e. **seas close to certain countries**, and less so the sea as a whole entity. And this is even excluding the thousands of times the sea is used as part of a name such as the 'Black Sea', 'Baltic Sea' and 'North Sea', which likely reinforce this territorial discourse around the term 'sea'.

"Domestic sea passenger numbers decreased by 2% to 42.0 million"
(11-11-2020)

“Waters within 0 and 6 nautical miles of the territorial sea adjacent to Northern Ireland” (22-06-2023)

Similarly, the collocates of ‘waters’ include “territorial”, “English”, “uk”, “external”, “internal” and “offshore” (Figure 5).

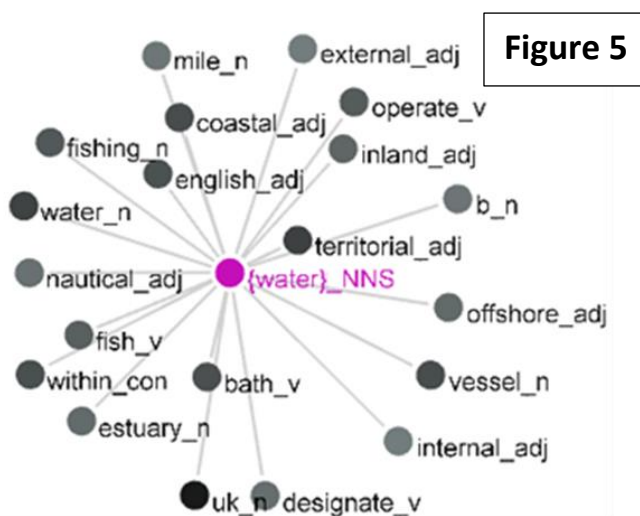


Figure 5

This again reflects the dominant way that the sea is spoken about in terms of certain areas, with concerns about laws or maritime activities in certain ‘waters’. This fits with the current **‘territorialization’ practice** by states that extend their control over increasingly large portions of the sea, whether EEZ, continental shelf, MPAs and other zones, transforming the ocean into a grid, subject to sovereignty claims or jurisdiction much beyond territorial waters ([Germond, 2022](#)).

This discourse is even more pervasive in discussions of ‘marine’, which has frequent collocates “area”, “zone” and “south” (Figure 6). The collocate ‘conservation’ was used to describe ‘marine conservation zones’ more than any other use.

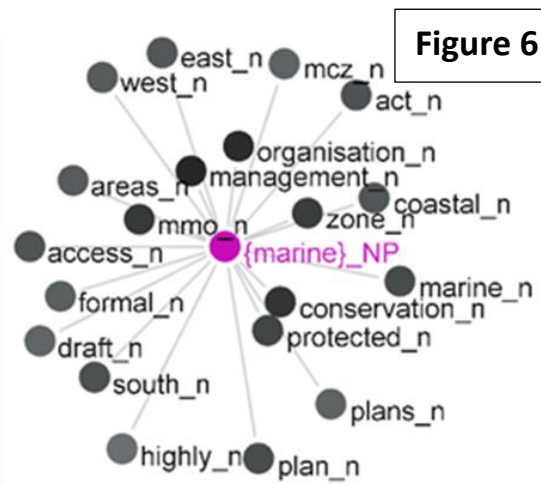


Figure 6

This **territorial and managerial discourse** is also shown by the way ‘marine’ is predominantly used in the noun phrase “marine environment” and less frequently as “marine life”, “marine species” and ‘marine biodiversity’. The ‘marine environment’ is discursively constructed as an area, and embedded within a

bureaucratic, technical discourse of spatial planning, governance, management and organisation. This technicality of the discourse also reflects previous findings ([Germond & Germond-Duret, 2023](#)).

It is worth highlighting how **this discourse is intertwined with both the economic, and the threat discourse.** We see 'fishing', 'vessel' and 'operate' in the top collocates of 'waters', and 'protect' and 'access' as strong collocates for 'marine' in Figure 5 and Figure 6 respectively, reflecting how these construed areas must be protected, transportation and resource access managed, or economically operated in. When constructed as areas, the sea is easier to control, manage, and is embedded in this economic discourse. As mentioned above, the narrative stresses that economic objectives (profit) cannot be achieved without security and stability, hence the need for enhanced ocean governance and control of the sea (including flows of goods and people). This is sometimes even presented as a societal opportunity:

"There are exciting opportunities for people with experience and a passion for their inshore marine area to play a major part in shaping how their local area is managed." (02-12-2020)

4. Weak sustainability discourse

Where issues around sustainability are mentioned, this is often related to concerns and threats. As mentioned above, 'rising sea levels' is something frequently discussed in relation to 'sea', with no real mention of sea life beyond market fish and territorial areas. **Still, sea level rise, environmental degradations and ecological concerns are present in the discourse:** 'Ocean' is collocated with 'plastic', 'pollution' and 'acidification'.

Yet, the top collocates of 'maritime' mostly lack sustainability concerns (see Figure 4 above). There is one exception: 'clean'

appears as the 23rd strongest collocate. A further concordance analysis of 'clean' with 'maritime' reveals that of 96 instances, 45 are relating to 'technology' (26), 'solutions' (8) or competition (11), 28 to the 'plan' (23) or sector (5). This reflects how sustainability is referred to in abstract and technocratic terms like 'clean maritime technology', and 'clean maritime plan', and less with what this means, or why it is important. **Solutions are presented in a technical, generic and managerial way, with an emphasis on the need for 'clean' technology:**

"The clean maritime plan is the environment route map of Maritime 2050, and will also act as the UK's national action plan on shipping emissions" – (11-07-2019)

Looking at '**green**', which is a positive sustainability term occurring 2307 times, the top five collocates for 'green' are 'revolution', 'finance', 'jobs', 'industrial' and 'spaces' reflecting the dominance of the themes presented above. Turning to the collocates of '**blue**' that, at 893 occurrences compared to the 2307 'green' occurrences, is comparatively minor in the discourse, we note collocations with 'ocean', 'planet', and 'algae'. There are also collocates of 'economy', 'programme' and 'fund' showing the economic concerns with the discourse of the 'blue economy'.

There are some **sustainability positives in the discourse around 'marine'** (see Figure 2 above), such as the strong collocates of 'protection', 'protect', and 'conservation'. There is also an encouraging subset of uses which describe protection of marine 'life', 'biodiversity', 'species', 'ecosystems' and 'wildlife'. However, it is worth noting the implications of 'conservation' explored in the previous section, where marine conservation is closely tied to economic concerns, and territorialization. Similarly, 'protect' is more often used to describe 'marine

protected areas’ or the ‘marine environment’. Concordance analysis of ‘sustainable’ as a collocate of marine shows that it also appears to be used in a bureaucratic, or economic sense:

“The Blue Belt Programme supports the UK Overseas Territories with the protection and sustainable management of their marine environments.” (19-06-2023)

“The Commonwealth Marine Economies (CME) programme aims to support sustainable marine economies that: - create jobs - drive national economic growth - reduce poverty ...” (06-02-2023)

This highlights how the sustainability narrative, where it exists, is so deeply **entrenched within the bureaucratic and territorialisation discourses** that genuine positive representations are backgrounded.

5. Ocean-positive

‘Ocean’ breaks some of the above trends in some way. Although it is the least frequent term from our search list, the way the ‘ocean’ is discussed reveals the term as a potential driver for sustainable and emotive connotations. As shown in Figure 7, top

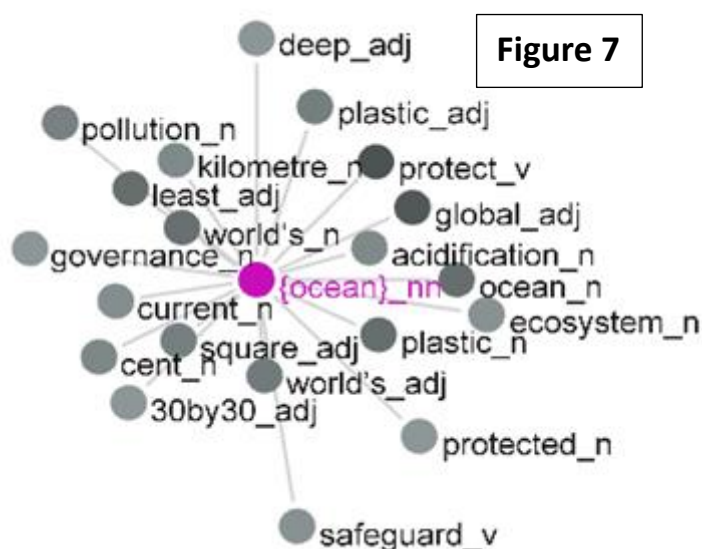


Figure 7

collocates of ocean as a common noun include ‘world’s’ and ‘global’. This is a notable difference to the territorialisation that has been identified with discourse around the ‘sea’ as well as around ‘marine’:

“A new global alliance to help drive urgent action to safeguard the world’s ocean and protect its precious wildlife” (2019-09-24)

“Every year more than 12 million tonnes of plastic enter the world’s ocean from land, rivers and marine activities” (2023-03-02)

We also see the notion of ‘protection’, ‘protect’ and ‘safeguard’. But, in this context, these terms are used to describe **protection of the ‘world’s ocean’**, ‘the ocean’, ‘our ocean’ and ‘the global ocean’. This is in contrast to sea – where ‘protect’ is used for sea resources and protection from rising sea levels, and marine – for which the majority described ‘protected areas’. Interestingly, ‘governance’, although not a frequent term, is a collocate for ‘ocean’ as a common noun in the 2018-2023 corpus, with there being ‘national ocean governance’, ‘regional ocean governance’ and ‘foundations of good ocean governance’ which can be ‘strengthened’. This exemplifies how ‘ocean’ is, similar to ‘sea’, taken up into a territorial/bureaucratic discourse, but in a way which territorializes the governance process, as opposed to the sea itself.

It should also be noted that the concerns which collocated with the ocean, such as ‘plastic’, ‘pollution’, and ‘acidification’, frame the ocean as a victim, reinforcing this protection discourse. This is in contrast to the sea, which is framed as a threat through the phrase ‘rising sea levels’.

6. Lack of emotion

A lack of emotive representations of the sea was identified in a previous study of newspapers ([Dayrell, Germond & Germond-Duret, 2022](#)). An analysis of the theme of ‘emotion’ within the two corpora in this study can help identify if, and how, emotive connotations appear. Wmatrix (a semantic tagging tool) allows us to compute a list of the most frequent sub-categories of emotion in relation to a certain theme. The top emotion

subcategories from the more recent corpus are as follows (see Table1):

Semantic Tag	Relative Frequency (per million tokens)	Top Terms (in order of frequency)
Violent / Angry (E3-)	1,269	Force, threats, threat, attacks, attack, abuse, violence, aggression, violent, threatened
Happy (E4.1+)	417	Delighted, relief, celebrate, happy, reliefs, celebrating, celebration,
Content (E4.2+)	382	Proud, pleasure, pleased, satisfied, satisfy, pride, content
Like (E2+)	378	Like, enjoy, precious, popular
Worry (E6-)	353	Concerned, concerns, concern, care,

Given the identification of a discourse that highlights the ‘threat’ the sea poses, it is notable that **the dominant tag, by far, is that of ‘violent/angry’**. Whilst ‘force’, ‘attacks’ and ‘attack’ are closely related to the military discourse in the corpus, we see an additional narrative, i.e. that ‘threats’ need addressing. Collocates of ‘threat’ include ‘face’, ‘tackle’, ‘counter’, ‘deter’, ‘respond’, ‘address’ and ‘adapt’. It should also be noted that ‘climate’ is the 30th strongest collocate to threat. This may highlight the influential extent of the discourse of ‘threat’ which pervades other issues in the corpus:

“With climate change posing an existential threat to the region as we know it” (2023-02-09)

“Accidental bycatch in fisheries is one of the greatest threats faced by vulnerable marine species” (2020-01-16)

“Russia is not our only threat. We face a multitude of other challenges [at sea]” (2018-06-20)

There are **some positive emotive categories** of 'happy', 'content' and 'like'. However, these are not directly related to the sea. **Politicians** are 'delighted' to 'announce', 'welcome', 'appoint' or 'to see' things like progress, or visions. Pride comes from how 'proud' we are of our 'history', 'achievements', 'tradition' and 'heritage':

"We have a proud shipbuilding history" – Transport Secretary Grant Shapps (2021-03-22)

"As island nation with a proud maritime heritage, shipbuilding is a vital part" – International Trade Secretary Anne-Marie Trevelyn (2022-03-10)

This analysis shows that emotive connotations are possible and indeed prevalent within government communications, most notably in naval and foreign policy discourses. However, such connotations are not closely linked to advancements or achievements in environmental policy or fond descriptions of the sea.

Another theme of 'physical attributes' is worth looking at to see if there are any prominent descriptions that could link to an **aesthetic discourse**. We found occurrences of 'beautiful' landscapes, beaches, wetlands, coastline and countryside.

1. Economic and sustainability discourse: an imbalance?

Our findings corroborate previous findings and cognate studies: the sea is, before anything else, represented as a source of riches, a site of economic activities and an opportunity for profit. Threats are defined as threat to the 'sustainable' exploitation of the ocean, understood as the non-exhaustion or pollution or destruction of the resources the sea brings. Additionally, the social dimension of sustainability is not prominent in the corpora. The sea is valued, and it needs to be protected but mainly from an economic, utilitarianist perspective.

2. Discourse of threat and danger: negative feelings

The discourse of threat and danger is framed in a way that fits with the economic and weak sustainability discourses. Safety and security are prerequisites for economic growth, investments and a profitable maritime economy. The sea, and especially the 'ocean' is represented as in danger, in need of protection, but 1) the main rationale is not moral but economic (e.g., risk of depleting fish stocks entailing negative economic impacts), and 2) the sea itself is a source of threats for human beings (notably via sea level rise) as opposed to the human cause of sea level rise via climate change effects. Negative feelings are associated with the sea, such as sea level rise, pollution, threats.

3. Managerial and technical representations (and lack of emotion)

This need for security and stability in the maritime domain is supported by a territorialization discourse that calls for more control and governance at sea. The economic, weak sustainability

and territorialization discourses are all underpinned and reinforced by a bureaucratic and managerial discourse that represents the sea in technical terms. This is thus not surprising to see very few instances of emotional representation in the discourse.

Our findings point towards strategies to communicate about the sea more effectively:

Valuing the ocean through emotions

Ocean citizenship requires a degree of connection to the sea that the existing narrative does not convey. Current communication on the sea can only serve an agenda of economic development and opportunities, and at best of weak sustainability. The narrative around the sea is too much utilitarian/opportunistic and not emotional enough:

- This contributes to a lack of sense of belonging and the valuing of oceans for their sole economic importance. This can negatively impact on ocean citizenship.
- People's *economic* awareness of the sea is necessary but not sufficient. Ocean sustainability (i.e. recognising the utter importance of the environmental and social dimensions of oceans) requires a stronger *emotional* connection with the sea.
- Public policy stakeholders which want to further develop ocean awareness among the wider public need to contribute to the promotion of a narrative about the sea that is not just utilitarian (revenue, job creation) but also emotional. To improve communication in a way that fosters more interest in the ocean as a place, communication should adopt a more emotional and less managerial tone. Beyond an economic, utilitarianist narrative, there are other values linked to the sea: Nature, Wildlife, Wellbeing, Global.

Highlight what positive aspects of the sea are specifically being protected

There is a noticeable relative lack of discussion surrounding the benefits of the marine environment. Narratives describe the dangers that are being faced, such as 'plastic', 'pollution', and 'rising sea levels'. This results in the technical discourse of plans and projects to control these dangers, which reconsolidates the idea that the ocean is dangerous, and an empty void ([Germond & Germond-Duret](#), 2016). Such a focus on controlling the dangers also contributes to the focus on 'maintaining' the status quo, which can be linked to climate change inertia ([Remling](#), 2023).

To move past these narratives, it is important to define and describe the positive aspects of the sea, and what it is we are specifically trying to protect. Through this, more positive emotion and evaluation of the sea can be imputed into the narrative. For example, "limiting plastic" should be linked to "protecting the biodiversity in our British seas", as opposed to "conservation areas" or "marine plans".

Incorporate more hopeful narratives

Our analysis revealed prominent discussions of 'threats' and 'dangers' which encourage worry, rather than hope. For example, the 'sea' is very regularly framed as a threat through the collocation 'rising sea levels', suggesting we must control, and be protected from, the sea.

Worry can encourage climate action but too much can be debilitating and encourage apathy; it is important to simultaneously provide 'hope' to communicate to both engaged and disengaged audiences ([Smith & Leiserowitz](#), 2014). In

particular, 'rising sea levels' portrays the sea as an agent of climate change, rather than the victim. This can partially explain the distinct lack of a discourse about protecting the sea. Recognising the anthropogenic causes of climate change can re-establish the sea as being negatively impacted by climate change. Such a recognition can come from an emphasis on local mitigation efforts portrayed as opportunities for innovation, which has been shown to shift the narrative towards more empowering, and hopeful ambitions (Tenali & McManus, 2022).

Use 'Ocean' rather than 'sea' when engaging the public on sustainability

It is important to recognise the current contrasts between the terms 'sea' and 'ocean' revealed by our analysis. In contrast to the threat connotations of 'rising sea levels', the 'ocean' is described as requiring protection and safeguarding. The 'ocean' is also construed as belonging to the 'world', as a 'global ocean' of awe-inspiring size. These more positive connotations consolidate the need to protect it, and help to avoid the unhelpful managerial, territorialisation and threat discourses related to the sea. This suggests that 'ocean' could be a much more effective term than 'sea' when engaging the public on sustainability and increasing awareness of its importance.

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Part of our aim at CASS is to make Corpus Linguistics accessible, which is why we have created our **free online FutureLearn course**. With the course, we aim to demonstrate that corpus approaches can offer researchers from all disciplines unique, valuable insights into the use and manipulation of language in society. We provide all you need to start 'doing' Corpus Linguistics yourself.

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