Framing ecological science for impact in media communication

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⚙ **Communicating Earth science for impact**

Environmental Science
Conservation Biology
Ecosystem Science
Marine Science
Ecology
Zoology
Limnology
Oceanography
Aquatic Science
Atmospheric science
Conservation Science

Media Communication
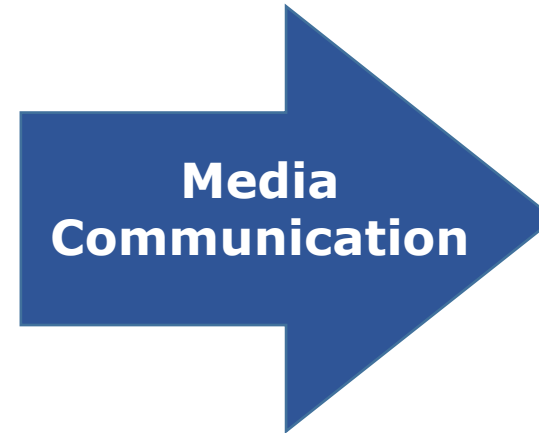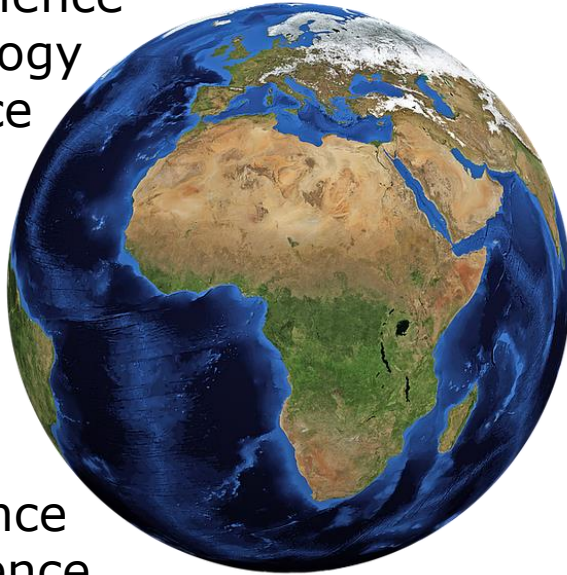
Public attitudes
Public opinion
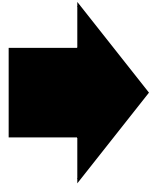Public behaviour
Public actions

Policy action
Legislation change
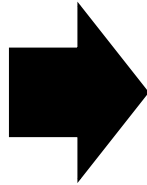
Process change
Technological adaptations

⚙ **Everything matters in the communication transaction**

4
Message recipient

3
Media / Mode

1
Messenger ➡ **2 Message** ➡

Online video
Newsletter
Opinion article
News media
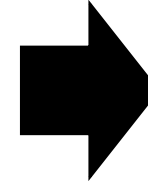
What is the most important issue for New Zealand today?

None of these, 0.8
Health care, 28.7
Poverty, 15.9
Terrorism, 0.2
The economy, 23.1
Education, 9.4
Immigration, 3.5
Crime, 2.9
The environment, 15.5
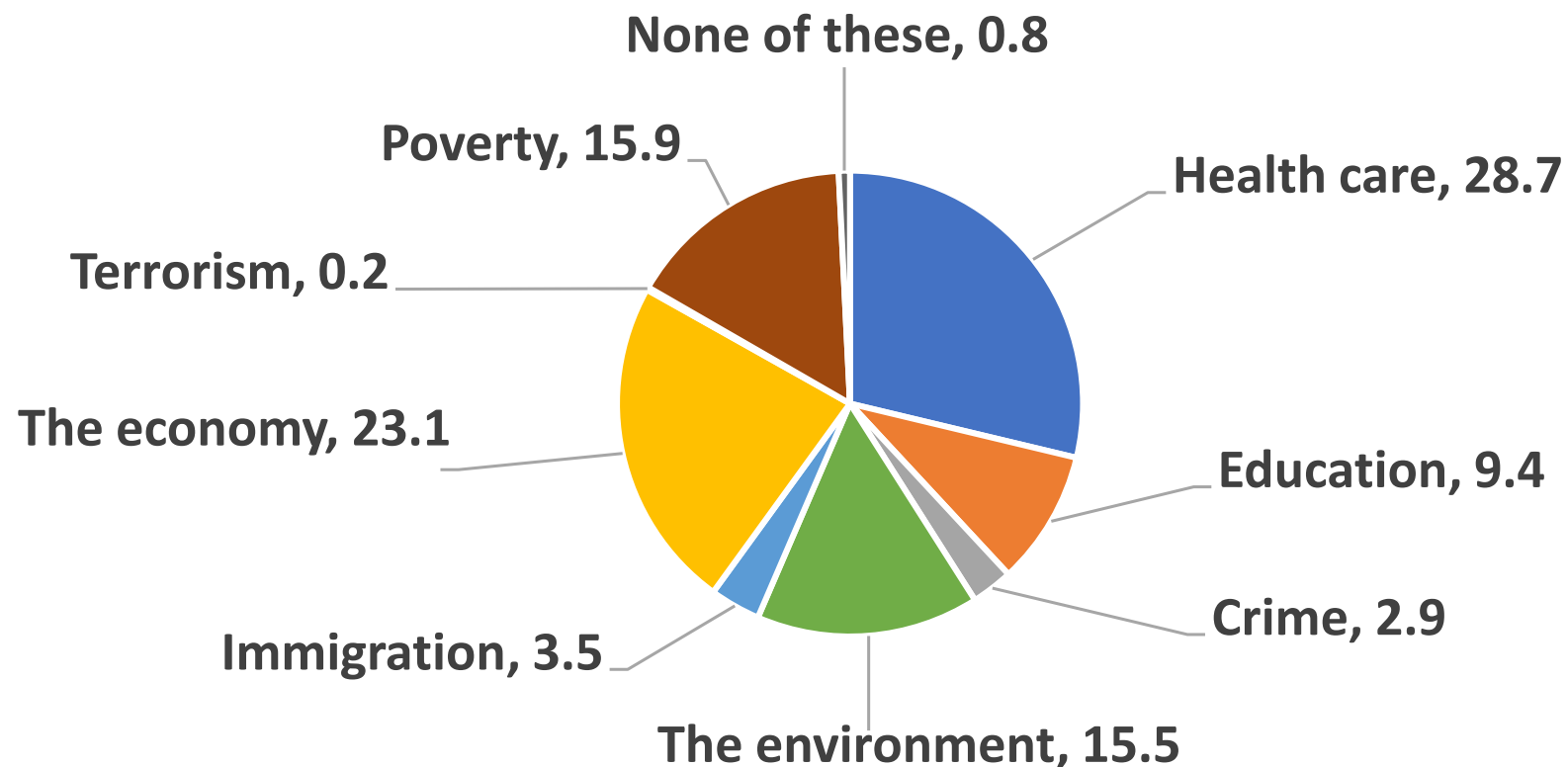
International Social Survey Programme (Environment) 2021 (N=993)

✿ **Strategic message framing is:**

increasing the salience of selected aspects of communication to promote understanding, interpretation, evaluation, or treatment of those aspects (Entman,1993).

Framing Earth science:

- to elicit support for environmental protection
- to influence environmental behaviour
- to motivate participation in collective decisions about environmental conservation
- to gain support for an environmental project or policy

Framing Earth science:

- DOES NOT involve purposively distorting scientific evidence or exaggerating facts

- DOES NOT involve placing a false spin on an issue

- Rather, for the purpose of effective communication, framing is used to give greater emphasis to certain aspects over others while remaining true to scientific facts (Nisbet & Newman, 2015).

- In the eyes of the public, scientists don't risk losing credibility for advocating (Lach et al, 2003). Because scientists' advocacy is based on undistorted scientific facts, it is regarded as different from those of activists or interest groups (Parsons, 2016).

Communication frames

1. Problem vs solutions frames
2. Consensus frames
3. Efficacy frames
4. Social norm frames
5. Outcome frames – loss vs gains
6. Distance frames
7. Emotional frames
8. Value-based frames

(Kolandai-Matchett, & Armoudian, 2020).

Problem severity frame

- Used to convey urgency

- Risks:
    Overwhelming effect
    Disbelief
    Pessimism

- Best for problems that are new and unknown
- Best when there is a lack of public concern
- Best when used with a solution frame

Managing the Risk of Global Climate Catastrophe: An Uncertainty Analysis

Hung-po Chao[1]

Despite much scientific progress over many decades, the nature of global climate change remains highly uncertain, and the possibility of global climate catastrophe is one of the main concerns in public debates about global climate change. In this paper, we present a model which incorporates the risk of climate catastrophe in an analysis of greenhouse gas abatement strategy. In this model, the timing and severity of climate catastrophe are treated probabilistically. The impacts of key uncertainties on optimal policy are analyzed, and the expected values of additional information that reduces the uncertainty associated with the world economy, carbon cycle, climate change, and climate damage are estimated.

Responding to Climate Change Disaster

The Case of the 2019/2020 Bushfires in Australia

Jolanda Jetten [iD], Kelly S. Fielding, Charlie R. Crimston, Frank Mols, and S. Alexander Haslam

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Abstract: Climate change-induced disasters (e.g., bushfires, droughts, and flooding) occur more frequently and with greater intensity than in previous decades. Disasters can at times fuel social change but that is not guaranteed. To understand whether disasters lead to status quo maintenance or social change, we propose a model (Social Identity Model of Post-Disaster Action; SIMPDA) which focuses on the role of leadership in the aftermath of a disaster. Looking specifically at climate change-related disasters, we propose that intragroup and intergroup dynamics in both the pre-disaster as well as the post-disaster context affect whether leadership (a) has the potential to mobilize social identity resources to enable social change, or else (b) fails to capitalize on emerging social identity resources in ways that ultimately maintain the status quo. Given the importance of urgent climate change action, we predict that status quo maintenance is associated with post-disaster paralysis. In contrast, social change that is set in train by capitalizing on social identity-based resources holds the promise of greater post-disaster learning and enhanced disaster preparedness when it is focused on addressing the challenges brought about by climate change. We apply this model to understand responses to the 2019/2020 bushfires in Australia. Our analysis suggests that while an emerging sense of shared identity centered on acting to tackle climate change provides a window of opportunity for securing increased disaster preparedness, this opportunity risks being missed due to, among other things, the absence of leaders able and willing to engage in constructive identity-based leadership.

Keywords: climate change, disaster preparedness, social identity approach, leadership

▲ How South Beach, Miami, could look if temperatures rise by 2C. Photograph: Nickolay Lamm/Courtesy of Climate Central/sealevel.climatecentral.org

Portrait of a planet on the verge of climate catastrophe

Sun 2 Dec 2018
08.00 GMT

f 🐦 ✉ ◁ 12k

As the UN sits down for its annual climate conference this week, many experts believe we have passed the point of no return
by Robin McKie

⚙ Problem severity frame

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  Pessimism

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- Best when used with a solution frame

⚙ Solution frame

- Used to convey what people can do to make a difference
- Best for issues that people are already concerned about

- Can be weakened by perceptions of social and scientific uncertainties
- Effectiveness depends on action information and efficacy frames

Consensus frame

- Connected to scientific uncertainty concerning environmental risks and solutions

- E.g. Consensus statement from scientists, Historical examples that have come to similar conclusions, Weight of evidence (+ precautionary framing based on the Precautionary Principle[1])

- Most impactful when consensus framing includes dissimilar sources (e.g. industry and conservation)

[1] Principle 15, Rio Declaration, 1992

Efficacy frame

- Highlights the efficacy of individual and collective action

"16,156 individual submission to the Ministry for the Environment led to the banning of plastic microbeads in New Zealand"

Zealand to ban microbeads sooner than ected

Edmunds · 15:21, Aug 17 2017

GREENPEACE/SUPPLIED

a will take effect six months after World Trade Organisation notification

New Zealand will ban the sale and manufacture of wash-off products

⚙ Social norm frames

1. Beliefs about behaviours that others approve or disapprove

2. Beliefs about majority behaviours

E.g. Germany leads the worldwide list with a recycling rate of 66 percent[1.] "Recycling is brewed into the culture here, and Germany's commitment to the practice is a source of pride for some.[2]"

Risks:

- may trigger increase in bad behaviour (if frames not complementary)

- diffusion of responsibility (if majority good behaviour perceived as sufficient)

1 https://www.climateaction.org/news/germany-is-the-worlds-leading-nation-for-recycling
2 https://www.huffpost.com/entry/germany-recycling-reality_n_5d30fccbe4b004b6adad52f8

Outcome frames

- Gains from environmental actions
- Losses from inaction

"*Solar panels will result in long-term financial savings*"

Distance frames

- Local and current frames generally more effective

- Important that the relevance of spatially or temporally distant environmental issues are emphasised in messages

Emotional frames

Used to persuade by eliciting specific emotions that can influence behaviour and actions

- Fear appeals – to convey urgency
- Guilt
- Shame
- Love for nature
- Empathy

Fires and floods: maps of Europe predict scale of climate catastrophe

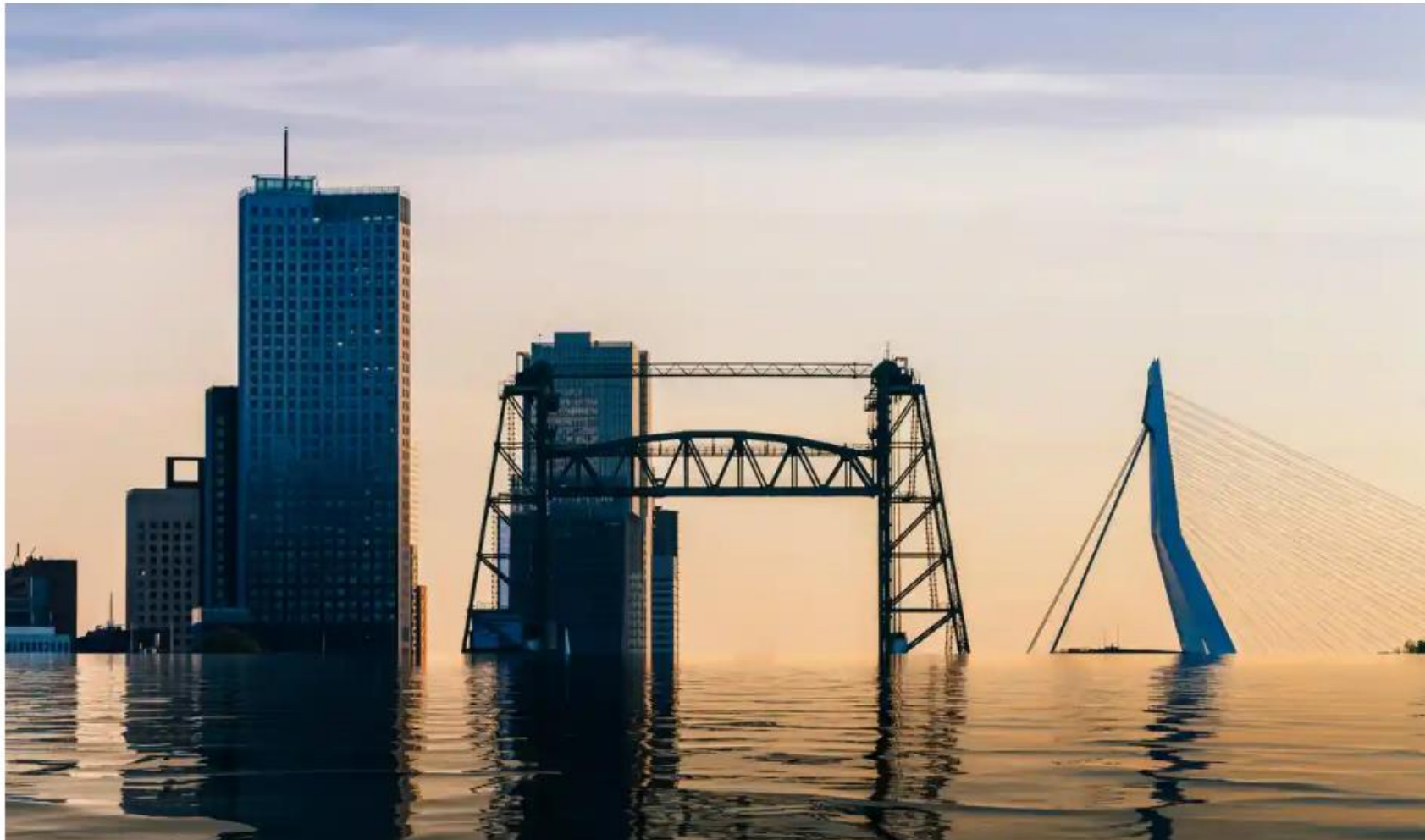**Without urgent action, rising sea levels by end of century could leave cities under water**

Jennifer Rankin
in Brussels

Mon 10 Feb 2020
06.00 GMT

1168

Atmosfear: Communicating the Effects of Climate Change on Extreme Weather

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ABSTRACT

The potential and serious effects of anthropogenic climate change are often communicated through the soundbite that anthropogenic climate change will produce more extreme weather. This soundbite has become popular with scientists and the media to get the public and governments to act against further increases in global temperature and their associated effects through the communication of scary scenarios, what the authors term "atmosfear." Underlying atmosfear's appeal, however, are four premises. First, atmosfear reduces the complexity of climate change to an identifiable target in the form of anthropogenically forced weather extremes. Second, anthropogenically driven weather extremes mandate a responsibility to act to protect the planet and society from harmful and increased risk. Third, achieving these ethical goals is predicated on emissions policies. Fourth, the end result of these policies—a nonanthropogenic climate—is as-

Value-based frames

- Anthropocentric (Human-centred)

  - Associated with the gains frame.
  - Frequently used, and thought to be suitable for general audiences (especially those holding anthropocentric and self-enhancing values)
  - Risk: encourages instrumental conception of nature

- Ecocentric (Nature-centred)

Review

Marine microplastic debris: An emerging issue for food security, food safety and human health

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ARTICLE INFO

ABSTRACT

Recent studies have demonstrated the negative impacts of microplastics on wildlife. Therefore, the presence of microplastics in marine species for human consumption and the high intake of seafood (fish and shellfish) in some countries cause concern about the potential effects of microplastics on human health. In this brief review, the evidence of seafood contamination by microplastics is reviewed, and the potential consequences of the presence of microplastics in the marine environment for human food security, food safety and health are discussed. Furthermore, challenges and gaps in knowledge are identified. The knowledge on the adverse effects on human health due to the consumption of marine organisms containing microplastics is very limited, difficult to assess and still controversial. Thus, assessment of the risk posed to humans is challenging. Research is urgently needed, especially regarding the potential exposure and associated health risk to micro- and nano-sized plastics.

The impact of debris on marine life

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ARTICLE INFO

ABSTRACT

Marine debris is listed among the major perceived threats to biodiversity, and is cause for particular concern due to its abundance, durability and persistence in the marine environment. An extensive literature search reviewed the current state of knowledge on the effects of marine debris on marine organisms. 340 original publications reported encounters between organisms and marine debris and 693 species. Plastic debris accounted for 92% of encounters between debris and individuals. Numerous direct and indirect consequences were recorded, with the potential for sublethal effects of ingestion an area of considerable uncertainty and concern. Comparison to the IUCN Red List highlighted that at least 17% of species affected by entanglement and ingestion were listed as threatened or near threatened. Hence where marine debris combines with other anthropogenic stressors it may affect populations, trophic interactions and assemblages.

"*Many scientists shy away from the press — or from uploading videos that show emotion…. We fear the simplification and inaccuracies … which could cause us to lose credibility with peers and funders. Yet, these routes might be the most effective way of getting information to policymakers and citizens, and so promoting conservation.*"

Figgener (2018, p.157)

DANIEL PULLEN

What I learnt pulling a straw out of a turtle's nose

When my video went viral, I found that communicating to non-scientists is uncomfortable — and effective, says Christine Figgener.

Three years ago, I uploaded a video of a sea turtle in distress. While collecting data for my PhD off the coast of Costa Rica, my team decided to remove what looked to be a barnacle encrusted in the nostril of the turtle, which we had captured for a research study. The object turned out to be a 10-centimetre section of a disposable plastic drinking straw. We filmed the process. That upsetting video (see go.nature.com/2qfci6f) has now had more than 33 million views, and became an emblem of the anti-straw movement.

It also thrust me into a world of high-profile advocacy I never expected to enter. I became involved in a documentary project, and community activists who were launching plastic-free campaigns asked for my support; I've gone to schools, conferences and screenings to talk about a subject that is not my main research focus. Last month, to my surprise, *Time* named me a 2018 Next Generation Leader, alongside celebrities such as Ariana Grande and Hasan Minhaj. All this has taught me that communicating beyond academia is worth trying, but it demands constant vigilance and caution.

I always have to remind non-scientists that my video is, of course, not the first documentation of how plastic harms marine wildlife. A legion of scientific articles does exactly that. But, for many, it takes videos such as mine to make these articles less abstract. I'd spent years making videos that I hoped would encourage conservation by showing the beauty of nature. They had little effect compared with my video of a bleeding turtle and a spontaneous anti-straw tirade.

Many scientists shy away from the press —

I AM SCARED THAT IF I TURN DOWN CHANCES TO **SPREAD THE MESSAGE,** I'M LETTING DOWN THE CREATURES I'D **HOPED TO HELP.**

life stages have the highest chance of survival and whether there is enough suitable habitat left for a species to even sustain larger numbers. Sometimes people are eager to undertake intense hands-on work (such as rescuing turtle eggs by digging them up and reburying them) even when less-dramatic efforts (such as establishing protected beach areas) would be sufficient and longer lasting.

Delivering compelling messages is difficult. I am used to obsessing over my data, not over how I look on camera. My research is dirty and smelly, full of long hours and unkempt hair. Conservation campaigns focus more on appearances, marketing and selling.

Thanks to my video, I have acquired a thicker skin and an eclectic set of skills ranging from copyright law, social-media marketing and unconventional ways of fundraising (I started a GoFundMe page for research). I learnt to ignore most rude and ignorant remarks: for instance, claims that I shoved the straw into the turtle's nose for self-promotion. If I respond, I draft an unemotional e-mail debunking accusations point by point with established facts.

What rankles more is when people try to take advantage of me. As in academia, philanthropy and advocacy are full of big egos that sometimes care more about advancing themselves than a cause. They are also less likely to buy into an ideal of citing and crediting others. I have learnt to be careful about how others use my work.

It might seem to other early-career scientists that I won the lottery by publishing a gruesome video rather than hundreds of scientific articles, but I am not even sure whether my modicum

Are we ecocentric or anthropocentric?

- New Zealanders' (n=427) New Environmental Paradigm scale score was 3.586 (mildly ecocentric) (Lovelock et al., 2013)

- New Zealanders' (n=116) rated an ecocentric frames as significantly more effective for motivating action for marine conservation than anthropocentric frames (Kolandai-Matchett et al., 2021)

Expressions of different frames of nature used in English language books between 1800 and 2008.
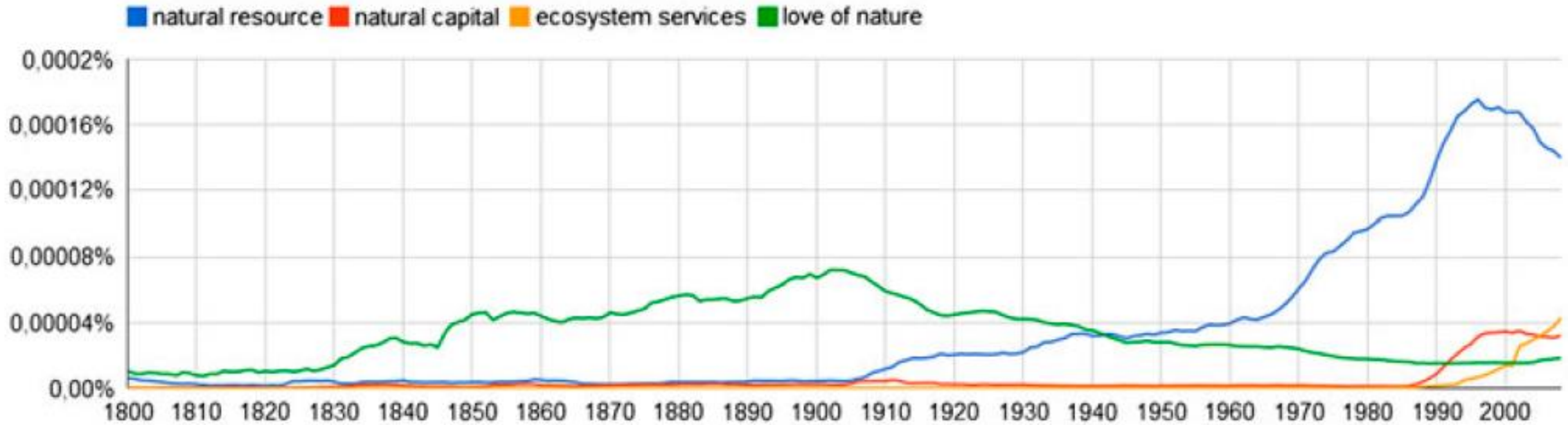

natural resource **natural capital** **ecosystem services** **love of nature**

Figure 1. Comparison of 'love of nature' with several instrumental expressions.

Antal, M., & Drews, S. (2015, p.1060)

THANK YOU!

- Questions or comments?

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