

# The Shifting Context of Sustainability: Growth and the World Ocean Regime

Peter J. Jacques and Rafaella Lobo\*

## Abstract

To better understand how regimes select norms and how sustainability concepts are used and change, we conduct a quantitative content analysis of important documents specifically related to a critical Earth system, the "World Ocean." Using the United Nations Food and Agricultural Organization's *State of the World's Fisheries and Aquaculture* reports from 1995 to 2016, we find that economic norms have always been dominant, and the use of sustainability concepts has become increasingly growth oriented. Discourses of restraint, relevant to principles of sustainability, are virtually absent. Growth is the central driving concern for the World Ocean Regime, a noncodified, economic regime that governs the oceans. We conclude that the norms of sustainability have been selected for fitness with the neoliberal political-economic order and a totalizing ideology of growth, and that sustainability concepts are used as a mask to legitimize extractivist goals that are actually not sustainable.

Even as sustainability concerns have become more urgent and important in science (Clark and Dickson 2003) and development (Anand and Sen 2000), there is still little understanding of how this organizing concept is used or how that use has changed over time. In this article, we consider the governance of the "World Ocean" (see, e.g., Jacques and Smith 2003 for a rationale of this term). We also attempt to understand the selection of norms in the World Ocean Regime (WOR), a noncodified regime governing the world's oceans identified by Lobo and Jacques (2017). In our 2017 article, we described the WOR through a quantitative content analysis (QCA) of global marine documents—the United Nations Food and Agricultural Organization's (FAO) *State of the World Fisheries and Aquaculture* (SOFIA) reports from 1995 to 2016. We return to this data to investigate sustainability discourses and norms over time. We find that sustainability discourses are increasing but are most often a proxy for growth rather than for ecological limits or social justice.

\* We are grateful to the anonymous reviewers and the students of the Political Ecology Lab at UCF.

## Norm Selection in Global Environmental Regimes

The study of regimes has been a cornerstone of global environmental politics (GEP) scholarship. Regimes are institutions, or sets of “principles, norms, rules, and decision-making procedures,” that govern an issue area (Krasner 1983, 1). Ruggie (1982, 380) explains how we know a regime is present:

In sum, we know international regimes not simply by some descriptive inventory of their concrete elements, but by their *generative grammar*, the underlying principles of order and meaning that shape the manner of their formation and transformation. (emphasis added)

This generative grammar reveals the norms of the regime, or the driving “assumptions, beliefs, and intersubjective meanings that govern and form the basis of social practices” (Stienstra 1999, 265). However, our understanding of norms and rules has been limited because most of the regime literature has been dominated by liberal institutionalism that has privileged states and traditional international relations (IR) notions of power (e.g., Haas et al. 1993; Young 1982). Thus IR and GEP have been limited to seeing norms selected by the outward artifacts of the state system itself, for example, treaties, missing much of what happens behind the outward, or “visible,” dynamics. In part, this is because liberal institutionalism obscures or “black boxes” political processes outside the “visible” text, such as the wording of agreements that construct institutions (Okereke et al. 2009).

Constructivists like Finnemore (1996) and Katzenstein (1996) have demonstrated that international norms can drive state behavior, interests, and identities. However, critics argue that constructivism does not explain “the prior question, however, of why some ideas get selected to become international norms over others” (Bernstein 2000, 464). Bernstein’s theory of “social–evolutionary” norm selection argues that norms are selected to fit the dominant political–economic structure, which explains the “most significant shift in environmental governance over the last thirty years, the surprising convergence of environmental and liberal economic norms” (464).

Bernstein (2000, 470) shows that ideas like sustainable development generated legitimacy where sustainable development was “aimed to legitimate *growth* in the context of environmental protection” (emphasis added). Likewise, Okereke (2008) finds that norms around equity are adopted most when they fit the neoliberal political–economic order.

It is entirely possible that whole political orders exist outside the official record, but empirically understanding this politics is difficult if it is out of view. Our study of “invisible” governing norms provides one of the first empirical studies in norm selection to account for structures of governing power outside the state system by identifying the generative grammar of actual governance outside of states through a large corpus of semantic behavior of an important international organization across twenty years.

Our suspicion that there are potent influences outside state behavior is compatible with Gramscian theory, which suspects norms are selected to fit a broad moral order that empowers and protects a ruling elite (Levy and Newell 2005). As a noncodified regime, the WOR is unaccountable to the public good, we expect sustainability norms in the WOR to be selected to fit neo-liberalism and are invoked as a way to protect and legitimize elite economic interests.

## Triangulating Sustainability

In this section, we explain profiles of sustainability that inform our dictionary of terms we will use to search the data: the principles of sustainability, sustainable development (SD), and maximum sustainable yield (MSY). Principles of sustainability guide us to general requirements for sustainability, SD is prominent in international policies like the Sustainable Development Goals (SDGs), and MSY is central in managing renewable resources. In theory, MSY could be used as a specific policy to reach the larger policy goals of SD consistent with the principles of sustainability. Since the profiles cover different scales, we hope to miss fewer discourses.

### *Principles of Sustainability*

Like “justice,” sustainability is “essentially contested,” because there is no objectively true single definition. As soon as sustainability is operationalized, there is disagreement (Jacobs 1999; Jacques 2015). Take, for example, the disagreement on estimating overconsumption in Arrow et al. (2004) versus Daly et al. (2006). These conflicts have left governmental commitments to sustainability “anemic” (Farley and Smith 2013, 79).

Still, sustainability does have a recurring problem structure: as a system grows to some threshold, the preconditions for the system’s existence are eroded (Jacques 2015). For example, Gibbon (1994, 161) famously reports that the collapse of the Western Roman Empire was caused by “immoderate greatness. Prosperity ripened the principle of decay.” Growth “ripened” collapse. Thus limits to growth are a cornerstone of sustainability studies (Meadows et al. 2004).

There is also a substantial literature on the *principles* of sustainability. Davison (2008, 193) writes,

Imagine principles of sustainability as a tightly aggregated nucleus around which orbit only loosely aggregated goals of sustainable development. The small area of agreement established by the ideal of sustainability is nonetheless sufficient to bind together a wide constellation of diverse sustainable development objectives.

Princen (2003, 49) argues the core principle of sustainability is sufficiency—“enoughness” to meet the needs of everyone in the world without exhausting critical life-support systems:

Under ... conditions, namely [of], environmental criticality, a different set of principles is needed, a set that embodies social restraint as the logical analog to ecological constraint, a set that guides human activities when those activities pose grave risks to human survival.

Goodland (1995) as well as Daly and Cobb (1989) and Daly (1990) set forth principles of sustainability that refer to living within the means of complex natural systems, which requires resilience—the ability to return to an original condition after a disturbance (Gunderson and Holling 2002). Also, observing limits requires a precautionary skepticism, the Precautionary Principle, for initiating irreversible or long-lasting changes. This principle also warns against putting health or the environment at risk, even if scientific understanding is incomplete.

Thus general ideas of sustainability include restraint, observation of limits to growth, precaution, and resilience.

### *Sustainable Development*

The World Commission on Environment and Development’s (WCED; 1987, 40) report *Our Common Future* put SD in mainstream discourses with the following assertion:

Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future. Far from requiring the cessation of economic growth, it recognizes that the problems of poverty and underdevelopment cannot be solved unless we have *a new era of growth* in which developing countries play a large role and reap large benefits. (emphasis added)

The so-called “triple bottom line” of Economic development, Equity, and Environmental integrity emerged as a result and are sometimes called the 3Es or 3Ps (People, Planet, Profit/prosperity) (Valentin and Spangenberg 2000), touted as the, “three fundamental sustainability dimensions” (Hansmann et al. 2012, 451). However, the 3Ps overestimate the importance of profit, which is somehow outside of “people” (Seghezze 2009). Still, there is agreement in the literature that the pillars are in the primary “dimensions” of all sustainability notions and pragmatic projects (Scalia et al., forthcoming). To say these are dimensions does little to tell us principles of sustainability, but it does explain the fields in which change occurs.

Importantly, social and ecological complex interdependence means that SD principles must be integrated across all three pillars (e.g., Anderson et al. 2015).

SD has gained a great deal of currency. For example, the SDGs were accepted by all 193 United Nations member states and may be a “major potential turning point in the future of humanity” if operationalized as an alternative to growth (Costanza et al. 2016, 59).

Nevertheless, SD is used in different ways. Hopwood et al. (2005) map these differences by degrees of required social change. Transformationists see the world social structure rooted in domination that will not change on its own but needs to be fundamentally reworked toward justice, equality, and ecological preservation. Reformists believe reasoned argument will reform current social systems enough, but radical change and the threat of collapse are not considered. Those who favor the status quo focus on growth and markets and do not see social or ecological problems as important threats. Hopwood et al. note,

This is the dominant view of governments and business and supporters of the status quo are most likely to work within the corridors of power talking with decision makers in government and business. (42)

The focus on growth has made SD controversial. For example, Garret Hardin (1995, 206) critiqued the WCED’s call for growth and sustainability as fanciful: “It is pleasant to have one’s dream ship propelled by the sail of conspicuous benevolence,” but not realistic. Daly (1990) and Goodland (1995) argue that SD must be unhitched from growth. However, if SD “simply reformulates the concept of growth as sustainable development” (Tijmes and Luijf 1995, 331), SD becomes a mask for growth.

Governments have widely adopted the idea of SD rather uncritically as a political expedient (Lélé 1991), facilitated by the ambiguity of specific trade-offs (Hempel 2009). Market forces then fill the conceptual void, making SD a friendly discourse to free market capitalism (Doyle 1998). For example, Wanner (2015) shows that SD is successfully used by neoliberal forces as a “passive revolution”—the Gramscian theory that the ruling class can maintain hegemony by coopting popular concerns without fundamentally changing the organs of power.

When it comes to fisheries, the FAO has issued the Code of Conduct for Responsible Fishing (CCRF). Like Agenda 21, the program is a set of nonbinding suggestions, but it does include the three pillars, for example, in Principle 6.4:

Conservation and management decisions for fisheries should be based on the best scientific evidence available, also taking into account traditional knowledge of the resources and their habitat, as well as relevant *environmental, economic and social* factors. (emphasis added)

The CCRF shows real concern for integrated, precautionary sustainability. However, Stephenson et al. (2017) note that despite “high-level” calls for SD, specific country-level management goals beyond catch are largely missing, perhaps because the CCRF stands in opposition to neoliberalism. Indeed, human rights abuses in fisheries, like slavery or abrogation of Indigenous fishing tenure,

have been lower priorities, only now receiving some attention (Kittinger et al. 2017).

The SD literature tells us to look for an integrated set of the 3Ps in addition to “sustainable development.”

### *Maximum Sustainable Yield*

Peter Larkin (1977, 1) explained the general idea of MSY in a widely noted talk:

Briefly, the dogma was this: any species each year produces a harvestable surplus, and if you take that much, and no more, you can go on getting it forever and ever (Amen). You only need to have as much effort as is necessary to catch this magic amount, so to use more is wasteful of effort; to use less is wasteful of food.

Fishery MSY was first proposed in the early twentieth century, but the US State Department used it to grow US fishing interests from 1949 to 1955 (Finley 2011). By the 1980s, there was no “operational rival to MSY” (Barber 1988, 153).

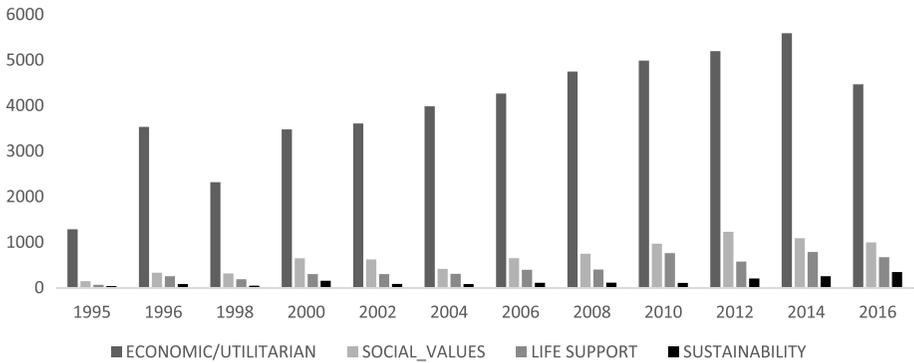
Theoretically, MSY could lead to sustainable harvests, assuming accurate stock assessments and low interaction effects with other species. However, even in the first stock-recruitment models used in MSY, Beverton and Holt (1957) warned that MSY could drive extinction (Pitcher 1998). Fish species with smaller biological potential will be reduced because the MSY of Generation 2 is smaller than that of Generation 1. Unamended, “MSY is equivalent to a call for the extermination of some species” (Geček and Legović 2012, 96) that become victims of history’s lost gaze.

Ironically, MSY policies assume that as fish become more scarce, economic pressures would automatically diminish (Pitcher 1998), but this is terribly wrong. Fishing interests often dominate fishing decisions (Okey 2003), and authorities are pushed to set limits above the “magic amount” in what Eagle and Thomson (2003) call “regulatory overfishing.” Furthermore, fish scarcity can drive prices up, incentivizing fishing independent of regulations.

However, we do have better models. Old coastal cultures typically managed fisheries well through parametric approaches (Acheson and Wilson 1996). Today, ecosystem-based fishery management (EBFM) accounts for food web interactions in complex systems, unlike MSY. EBFM is institutionalized in the CCRF and the 2001 Reykjavik Conference and was endorsed by the FAO Committee on Fisheries in 2003. Likewise, the so-called *Blue growth economy* uses analogous assumptions (Burgess et al. 2018)—though others warn Blue growth is just another neoliberal expansion that will hurt the poor (Barbesgaard 2018).

The FAO positions EBFM as the norm. In rebutting Pauly and Zeller (2016), who were critiquing FAO data, the FAO (2016a, 1) stated,

Paradigm shifts ... have occurred in the fisheries and aquaculture world in the last half century. Gone are the days of the productivity paradigm of continuously higher catches; capture fisheries governance is now focused



**Figure 1**

Categorical Frequencies in 1995–2016 SOFIA Reports for Economic Values, Ecological Values, Social Values, and All Sustainability Discourses

on ensuring sustainable catch levels with maximum economic value of these catches, with aquaculture growth bridging the gap between supply and demand.

While still working for “maximum economic values,” FAO is arguing fisheries are governed by principles of sustainability.

However, Skern-Mauritzen et al. (2016) find that only 24 out of more than 1,200 fisheries they reviewed actually implemented EBFM. Likewise, Webster (2013) found that the leading goals at regional fisheries management organizations were allocation (of the most catch) to member countries typically using single-stock MSY. In our data, we find that EBFM ( $n = 90$ ) discourses occur slightly more than MSY ( $n = 76$ ) but this does not indicate a paradigm change from economic production (see Figure 1).<sup>1</sup>

### Extractivism, Capital Flow, and an Ideology of Growth

Extractivism is contrary to the principles of sustainability. Ehrnström-Fuentes and Kröger (2018, 197) explain that extractivism is a specific expression of capitalism primarily used to explain Latin American (under)development models based on the extraction of minerals with foreign investment, but “today, the term extractivism refers ... any economic sector (e.g., farming, fishing, and forestry) engaged in the large-scale extraction of unprocessed natural resources with few benefits for the locals.” Thus the concept of extractivism is useful in GEP because it refers to the developmental role of natural resources in capitalism, much like primitive accumulation.

1. We searched for ECOSYSTEM\_APPROACH\_TO\_FISHERIES, ECOSYSTEM-BASED, ECOSYSTEM-BASED\_MANAGEMENT, ECOSYSTEM-BASED\_FISHERIES\_MANAGEMENT, COMPLEX\_SYSTEMS, and THRESHOLD\*.

The central norm for extractivism is increased production of raw material to feed the accumulation of capital and the treadmill of production (see Schnaiberg 1980). In extractivism, nature is a simple commodity. Mobile capital is constantly pursuing the frontiers of simplified, exhausted resources for resources still complex and rich, in an attempt to grow surplus capital through the  $M-C-\Delta M$  flow (Marx [1867] 1909), where  $M$  is money,  $C$  is commodity, and  $\Delta M$  is surplus value. Capitalist interests initiate this flow by enclosing productive natural capital in commons, commodifying and selling it, and then reinvesting the profit into the overall process to find more productive natural capital. Exposure to these market forces drove US Atlantic coastal decline (Jacques 2017), and continues to deplete fisheries: when one species is exhausted, fisheries move to another species, sometimes purposefully mislabeling them (Marko et al. 2004); when one trophic level is exhausted, fleets fish down to others (Pauly and Palomares 2005) and to new depths (Morato et al. 2006). Growth becomes a matter of unquestioned ideology in the Mannheim ([1936] 1972) sense—that is, a comprehensive thought-system of a historical period that obscures the nature of a society and facts that may contradict basic norms.

## Method and Analysis

Since generative grammar identifies the governing power beyond formal institutions, the problem is to identify this grammar in illustrative discourses. To accomplish this goal, we use QCA. QCA can analyze the architecture of underlying norms and test which norms are selected over time to dominate governance priorities.

### *Data*

Our data are all existing SOFIA reports at the time of writing, published by the FAO from 1995 to 2016. SOFIA 2016 discusses how these reports are written:

The State of World Fisheries and Aquaculture 2016 was prepared by staff of the FAO Fisheries and Aquaculture Department. General direction was provided by the Department's Information Management and Communications Committee in close consultation with senior management and under the overall supervision of L. Ababouch, Director, Fisheries and Aquaculture Policy and Resources Division. (FAO 2016b, vii)

We chose these reports as representative artifacts important to global marine governance, which the FAO (2014) portrays this way:

The State of World Fisheries and Aquaculture (SOFIA) is the flagship publication of the FAO Fisheries and Aquaculture Department. This premier advocacy document is published every two years to provide policy-makers, civil society and those whose livelihoods depend on the sector a comprehensive, objective and global view of capture fisheries and aquaculture, including associated policy issues.

These documents contain estimates of the global fish catch and policy discourses, but this does not mean the FAO is governing the World Ocean (see Jarosz 2009). Rather, the selective attention of FAO's semantic behavior is an indicator of norms that do govern a large part of the oceans.

Note that we are analyzing the WOR through fisheries, but given the interdependence of marine ecology, we assume these documents represent norms of the WOR that deal with everything that affects marine habitat—thus a wider set of ocean politics than the fish themselves, which can be evident in expression or neglect within the data. For example, pollution affects the water quality, but if the SOFIA reports neglect pollution, pollution is less important to the governing regime.

### *QCA Technique*

QCA assumes the frequency of a discourse indicates the relative importance of the discourse because it is a result of selective attention, and that the meaning of a word remains stable over time. We discard the latter assumption by asking how sustainability discourses have changed over time.

Laver and Garry (2000) and Grimmer and Stewart (2013) note that QCA requires layers of validation and testing. Grimmer and Stewart paraphrase Box (1976), warning that all QCA models are “false” but “some are useful,” because, despite efforts to reduce error, it is still a statistical construction where cases are selected out of the expected context (269). Here we use a conceptual QCA, which focuses on “presence, frequency, and centrality of concepts,” followed by relational analysis, which “tabulates not only the frequency of concepts in the body of text, but also the co-occurrence of concepts” (Indulska et al. 2012, 50). These concepts are discovered in the data through terms. This process is imperfect, and terms inevitably relate to more than one concept; thus QCA requires multiple steps of validation.

The first step of QCA is to preprocess the documents to exclude text that would inflate terms, such as index pages and front matter. Then intercoder reliability tests, factor analyses, and hand validation, after meticulous construction of a tested dictionary, are required.

We used a published dictionary by Xu and Bengston (1997) that measured aesthetic, ecological (named “life support”), economic/utilitarian, and moral values in forest management, which we modified to marine issues; then, we added categories for governance, science, overfishing, social concern, food, and specific fisheries. Terms were generated theoretically; that is, biodiversity is a life-support/ecological issue, and we put it in that category. The reliability of these decisions was tested by four other coders who placed fifty random terms into categories, and using Cohen's kappa, our reliability was “near perfect” ( $K = 0.827$ ).

Then, two kinds of factor analyses were used to measure how the words and categories were related to each other. Hierarchical clustering analysis was

used to test the coherence of the categories, and multidimensional scaling was used to ensure the categories captured distinct discourses using first- and second-order co-occurrences.

First-order co-occurrence measures word distance to other terms, say, in a sentence. Second-order co-occurrence measures the *semantic* similarity of terms, e.g., “juice” and “milk” are similar in that they are used with words like “drink” or “pour.” Then we hand validated each term to assure that we neither missed a synonym or related word-form nor found the wrong concepts as much as possible, for example, when looking for crude oil spills, searching just for “oil” will also find “fish oil.”

Thus we can have confidence in the dictionary categories because the intersubjective rules for placing them in their respective categories was highly reliable, the terms inside the categories were statistically related, factor analysis showed that the categories were distinct, and terms were hand validated by looking at cases of each term. The model is still “false” in that there will be words selected out of context, but the model has also been validated in four different ways to minimize error.<sup>2</sup>

Our category and subcategories of sustainability were constructed from the foregoing review of literature and comparing words suggested by Wordstat’s extensive thesaurus. However, we limit the terms to the words in Table 1 because other potential terms did not survive the validation tests and a concise list preserves analytic power. For example, a potential synonym of “sustain” is “support” (frequency = 9), but hand validation found the term is not used in the context of sustainability, such as “fisheries management guidelines being prepared in SUPPORT of the Code” (1996 SOFIA).

Stemming was used to capture all inflections of a term, indicated by an asterisk. For example, stemming “sustainability” to “sustain\*” retrieves “sustained,” “sustainability,” and “sustaining.” Furthermore, we did not allow for overlapping terms; therefore searches for “sustain\*” do not include cases of “maximum sustainable yield.” Thus, searches for “sustain\*” capture every use of sustainability *outside* MSY and SD. The cultivation of the larger data set is explained fully in Lobo and Jacques (2017) and is updated here with some changes (see the amended online appendix [https://www.mitpressjournals.org/doi/suppl/10.1162/glep\\_a\\_00480/suppl\\_file/glep\\_a\\_00480-Appendix.pdf](https://www.mitpressjournals.org/doi/suppl/10.1162/glep_a_00480/suppl_file/glep_a_00480-Appendix.pdf), part of which is found at Lobo and Jacques 2017). Because the varied use of SD made it unclear if precaution should be in the SD discourse or the principles discourse, we tested the closest affiliation using hierarchical clustering analysis. Precaution was slightly more affiliated with the principles of sustainability category, so we included it in that discourse, but we break it out for individual analysis in Table 2. Table 1 shows the terms that make up our sustainability categories (frequencies are in parentheses). Terms for SD in 5 and 6 were searched in every sequence order. Frequencies should be read as a measure of selective attention in the data.

2. All work was done through Provalis Wordstat, version 7.1.14, with the common English language exclusion list turned on to avoid capturing trivial words like *the*.

**Table 1**  
Dictionary Terms for Sustainability Discourses

<i>Discourse</i>	<i>Terms</i>
MSY (99)	MAXIMUM_SUSTAIN*_YIELD/MSY (76) TOTAL ALLOWABLE CATCH/TAC (23)
SD (169)	SUSTAINABLE_DEVELOP* (169) TRIPLE BOTTOM LINE (0) PEOPLE-PLANET-PROFIT/3P'S (0) ENVIRONMENT-EQUITY-ECONOMY/3E'S (0)
Principles of sustainability (1,343)	LIMITS_TO_GROWTH (0) LIMITS_TO_PRODUCTION (1) LIMITS_TO_SYSTEMS (0) RESTRAIN* (3) RESILIEN* (76) PRECAUTION* (127) SUSTAIN* (1,136)

Note: MSY = maximum sustainable yield. SD = sustainable development.

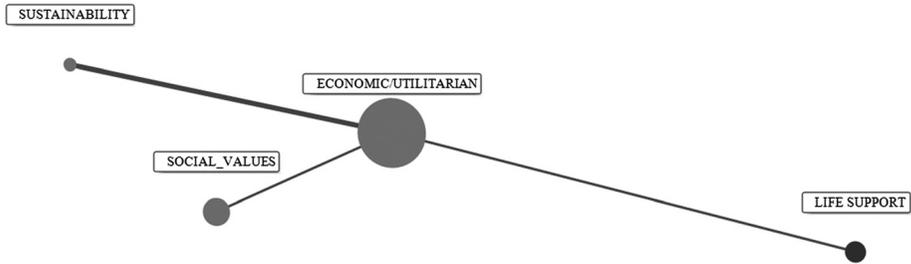
## Findings

### *Sustainability Compared to Other Issues*

Figure 1 shows that economic concerns dominate the WOR, with only minor interest in ecological life supports, social values, and sustainability, *indicating an extractivist generative grammar contrary to principles of sustainability.*

Importantly, the categories have different numbers of terms. Economic/utilitarian has 63 dictionary terms, and life support has 163 terms, but sustainability only has 13 terms. Clearly the number of terms does not dictate the relative selective attention—otherwise, life support would dominate—but we would expect that the lower number of terms for sustainability would affect the frequencies to some degree. We find that sustainability is growing in concern, but the WOR is least concerned with sustainability relative to categories listed.

Figure 2 shows the first-order co-occurrence relationships of the categories within the same sentence using multidimensional scaling to see how the categories relate to each other. The size of the circle is the relative size of that category, the darkness of the line indicates strength of relationship, and the placement of each circle indicates how close the categories are when they are used.



**Figure 2**  
Relationships Between Sustainability, Economics, Social Values, and Life Support in 1995–2016 SOFIA Reports

Figure 2 shows that the first relationships that form in the text to each category are to economic values. We test this by setting the tolerance for measuring the relationship to the lowest level at which each category has a relationship. Figure 2 shows that when one category is invoked in a sentence, it is likely alongside economic discourses. *Economics is the central discourse and priority*, and sustainability has the strongest relationship to this priority.

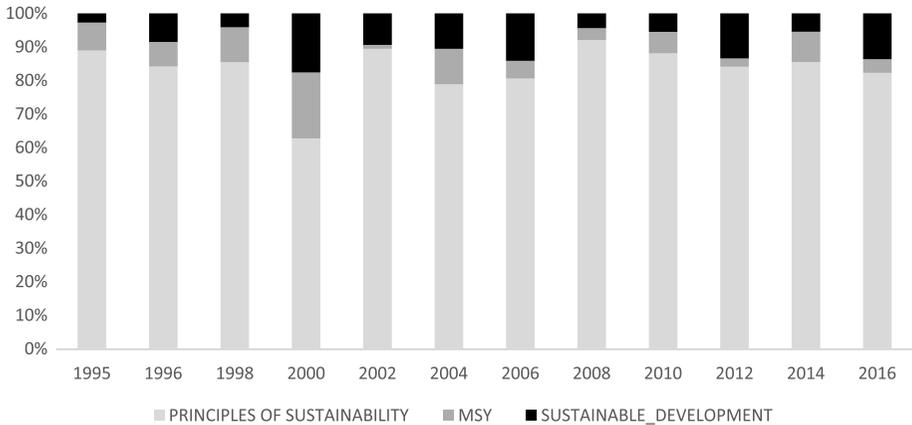
### *Sustainability Issues Compared to Each Other*

The rest of the article compares the categories of sustainability. Figure 3 shows the three sustainability narratives discussed previously, with terms listed in Table 1: MSY, SD, and principles of sustainability.

Figure 3 shows 100 percent of the uses of sustainability over time, measured as the total percentage of words in all reports (to account for the increasing volume of the SOFIA reports over time). Out of 1,625 references, only 6.1 percent relate to MSY, and SD only accounts for 10.4 percent, though overall use of sustainability has increased across the data.<sup>3</sup>

Now we turn to the 82.6 percent of cases *not* directly tied to MSY or SD, since it could be that this discourse is closer to the principles of sustainability noted earlier. For these cases, we created four rules that search for the ways terms are used under specific first-order co-occurrence scenarios at the sentence level. This method was developed in the 1980s and is a reliable way to understand the context of terms (He 1999). Here, the strength of co-occurrence is inversely proportional to the distance (number of words) between words (Lund and Burgess 1996). In a large corpus of text, it is possible to predict words based on

3. Growth in sustainability concern is statistically significant ( $p < 0.001$ ) at the 95% confidence interval; however,  $t$ -tests assume a continuous interval dependent variable and bivariate independent variables, and QCA uses text-based categorical variables. Sustainability percentages do not add to 100 due to rounding error.



**Figure 3**  
Relative Importance of Sustainability Discourses in SOFIA Reports, 1995–2016 (% Total Words)

their neighbors, but this power is weaker after four or five words (Hahn and Sivley 2011).

Thus, we created rules to find when the terms for principles of sustainability are within five words near the “3Ps” categories—the expected domains of action (Scalia et al., forthcoming)—in the same sentence: economic/utilitarian (profit), social values (people), and ecological life support (planet) and for when principles of sustainability terms are within ten words near all three categories (integrated sustainability)—accounting for more content.

Examples of each rule follow, where keywords are capitalized.

*Profit:* “In order to SUSTAIN INCREASED overall PRODUCTION from these new grounds, conservation and management are required for overexploited stocks to prevent further declines.” (1995 SOFIA Report)

“Capturing RESOURCE rent could generate ECONOMIC GROWTH both in the marine ECONOMY and other sectors, FINANCE fisheries management systems, and help ensure an ECONOMICALLY EFFICIENT and socially and environmentally SUSTAINABLE use of the RESOURCES.” (2008 SOFIA Report)

*People:* “Having learned from past mistakes, many countries, early movers as well as newcomers in aquaculture, now emphasize environmental SUSTAINABILITY and SOCIAL responsibility.” (2008 SOFIA Report)

“In addition to these, the SOCIAL aspects of SUSTAINABILITY include maintenance of fishing COMMUNITIES, EQUITY in income and gender, and basic HUMAN rights.” (2016 SOFIA Report)

*Planet:* “In fact, the greatest THREAT to the SUSTAINABILITY of inland fisheries resources is not overexploitation, but DEGRADATION of the ENVIRONMENT.” (1998 SOFIA Report)

"It is also important for implementing more sophisticated approaches to fisheries management, especially the PRECAUTIONARY and ECOSYSTEM approaches." (2006 SOFIA Report)

*Integrated:* "While the term "ECOSYSTEM approach" often evokes the idea that the approach is mainly a natural-science undertaking, the approach adopted by FAO75 explicitly states the IMPORTANCE of taking into account all the essential components of SUSTAINABILITY (ECOLOGICAL, SOCIAL and ECONOMIC), i.e. taking a genuinely systemic approach by considering fisheries and aquaculture as systems whose SUSTAINABILITY depends on all their parts." (2012 SOFIA Report)

"[The FAO Blue Growth Initiative (BGI), 33 based on the sound principles of the Code, directly contributes to a wide range of SDGs (see section Global agenda – global ambitions, p. 80).] It prioritizes balancing the SUSTAINABLE ENVIRONMENTAL, SOCIAL and ECONOMIC aspects of use of our living aquatic RESOURCES."<sup>4</sup> (2016 SOFIA Report)

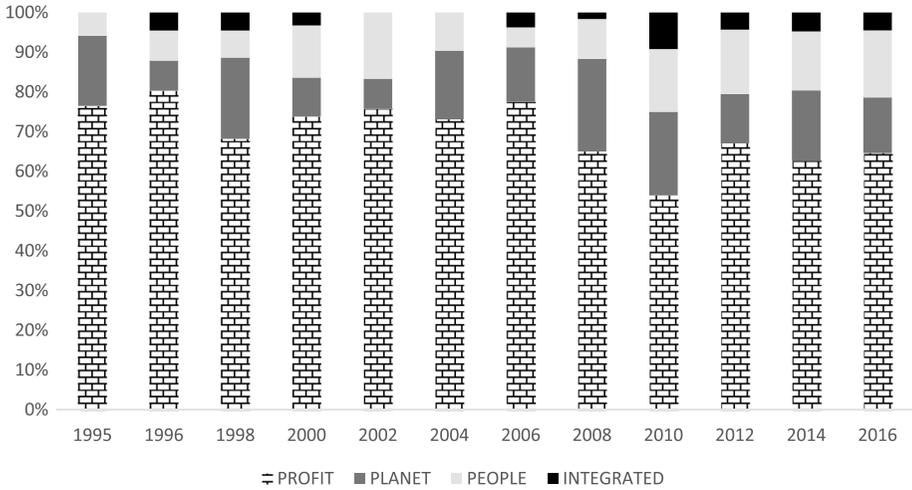
The examples of integrated sustainability show that the FAO itself is not hostile to the principles of integrated sustainability, though even this category in the second example is tied to growth (BGI).

Figure 4 shows 1,184 3Ps discourses, but profit dominates with 777 (65.6 percent) cases. People discourses make up 163 cases (13.7 percent), planet 183 cases (15.4 percent), and integrated sustainability makes up only 61 cases (5.1 percent).

Figure 5 answers our primary research question, graphing the same rules as a percentage of all words found in each year's report. Here we find some positive news: the rate of change for the average of the last three years for "people" discourses have increased six times their occurrence in the first three, while "planet" and "integrated" discourses are about two times more present than they were in the first three reports. Still, these increases start from very small proportions, sometimes from 0 percent, of the text and still add up to a very small amount, especially compared to the growing affiliation of "profit" with principles discourses, which are dominant every year and still grew two times in the last three years toward extractivism and away from principles of limits. Figure 5 shows that integrated sustainability only appears in five of the twelve reports and never at more than 0.01 percent—and is not a concern of the WOR.

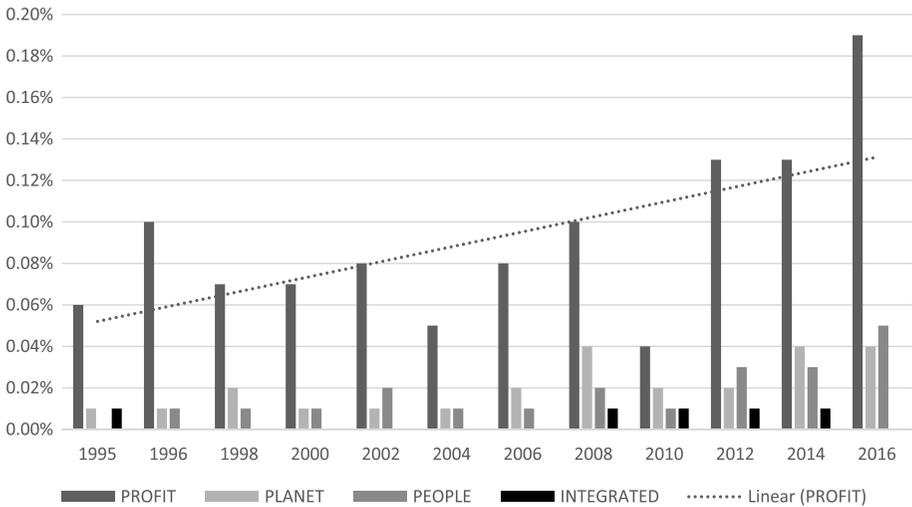
Table 2 shows the keywords outside of categories and measures the co-occurrence with growth using hierarchical clustering analysis using second-order associations. At zero, the terms are unrelated, so values above 0.5 indicate the terms are more related than not. "Growth" in Table 2 also includes the stemmed terms for "production" and "yield," which are perfectly associated with each other with a score of 1.0 in the same test. Terms 4–9 did not have enough uses to be analyzed meaningfully (and, when run, have zero relation to other discourses). Table 2 shows that sustainability is semantically used in a way that is highly related to growth. SD is used in alignment of growth the most, and

4. Note that the prior sentence in brackets is included to contextualize "It."



**Figure 4**  
Percentage of Discourses of the 3Ps Co-occurring with Principles of Sustainability in 1995–2016 SOFIA Reports

SUSTAIN\* the least, but averaged together, the terms from the principles of sustainability discourses (PRECAUTION\*, RESILIEN\*, and SUSTAIN\*) are aligned at the level of 0.775. Therefore all sustainability discourses are highly aligned with growth, and sustainability has come to be used as another way to refer to growth.



**Figure 5**  
Co-occurrence of 3Ps with Principles of Sustainability as a Percentage of All Words in 1995–2016 SOFIA Reports

**Table 2**

Association of Growth and Sustainability Concepts (Hierarchical Clustering Analysis, Cosine Theta)

<i>Keyword</i>	<i>Growth</i>	<i>MSY</i>	<i>PRECAUTION*</i>	<i>RESILIEN*</i>
MSY	0.838			
PRECAUTION*	0.815	0.845		
RESILIEN*	0.886	0.82	0.77	
SUSTAIN*	0.626	0.51	0.822	0.515
SUSTAINABLE_DEVELOPMENT	0.948	0.829	0.793	0.764

## Discussion and Conclusions

This research has discovered that, between 1995 and 2016, sustainability has become more growth oriented and growth dominates sustainability norms. Discussion of any kind of limits to systems or growth are systematically absent.

The more that concepts related to sustainability are used to actually represent growth, they mask truly *unsustainable* social action and regime governance. Similarly, McCormack (2017, 35) writes about the highly touted success of the New Zealand individual transfer quota system but finds that “the sustainability brand works to legitimise the privatisation and marketization of marine environments, to protect the income stream of quota investors, and to effectively incorporate and discipline dissent.”

Importantly, WOR norms are probably not organized by the FAO, or even the state system, but are selected for their fit with neoliberal ideology. In a political economic analysis of the FAO, Jarosz (2009) notes that, while early leadership argued that food was a human right, this proposition was scuttled by the United States, which used food aid as foreign policy tools to grow power and penetrate markets. Furthermore, “the FAO, from its inception, largely has been driven by the capitalist accumulation objectives foreign policy goals of the United States,” ignoring small-scale, self-sufficient, and organic approaches to agriculture and hunger prevention (55). Thus the FAO has met powerful opposition when hunger was not defined in terms of markets and higher production. Since then, the FAO has moved to information gathering as its most important contribution, and, as one former frustrated FAO chief noted, “the hungry people of the world wanted bread, and they were to be given statistics” (Orr, as quoted in Jarosz 2009, 43). Since then, the FAO’s budget has been decreasing along with any effectiveness to actually reduce hunger (Jarosz 2009). Thus the FAO is a translator of hegemonic norms, not a creator or driver of them, and normalized neoliberal hegemony drives the WOR. Note that our findings are based on the structure of these documents, not on antipathy from

the writers, who must write in line with the governors of the FAO—who, then, must conform to the expectations of capital accumulation (Jarosz 2009).

Just as Bernstein (2000) found that environmentalist norms were selected predicated, “on the liberal economic and political order,” we find that sustainability norms have evolved away from principles of sustainability, like restraint, to norms predicated on maintenance of neoliberal extractivism. The social evolution and Gramscian suspicions that power can operate behind, and even contrary to, formal institutions is supported. Indeed, it is possible that the hegemony of the neoliberal political economic order has become so widely internalized that it is an unconscious ideology in the spirit iterated by Mannheim ([1936] 1972)—a collective belief that blinds society to facts that contradict its future.

Finally, our findings fit a widening GEP literature documenting a disciplinary neoliberal governing order. For example, Paterson (1996) long ago indicated that neoliberalism had shaped climate governance. Okereke (2008) found that the limited impact of equity norms, including the Law of the Sea’s Common Heritage of Mankind, was due to neoliberal cooptation, placing markets above strong equity concerns. Dauvergne (2005) found that dominant commercial norms governed a noncodified system facilitating deforestation in the Asia Pacific. Dauvergne and Lebaron (2014) likewise found environmental organizations hard-pressed to act outside neoliberal norms, facilitated by punitive states that have made anticorporate activism a dangerous business.

Newell (2008, 518) concludes that environmental governance guided by economism is an “expression of the contemporary organisation of the global economy and the ideologies that rationalise it.” Thus global environmental governance that deviates “from received wisdoms about the pre-eminence of individual property rights and (ostensibly) laissez-faire economics, are discredited and ridiculed” (518). The WOR is yet another expression governing power shifting to markets, their rulers, and extractivist goals that are certainly contrary to the principles of sustainability.

**Peter J. Jacques** is a professor of political science and the National Center for Integrated Coastal Research at the University of Central Florida. He is president of the Association of Environmental Studies and Sciences (2018–2020) and a senior research fellow with the Earth System Governance. His fifth book, *Sustainability: The Basics* (2015), will be translated into Spanish by the end of 2018.

**Rafaella Lobo** is a PhD student in the Division of Marine Science and Conservation, Nicholas School of the Environment, at Duke University. Previously, she attended the University of Central Florida, where she received an MA in political science with a focus on environmental politics. She also has a BA in international relations from PUC, in Brazil. She has published in *Marine Policy*, and her current interests are in the challenges of international governance for

conservation and the inclusion of perspectives from the Global South, particularly at the International Whaling Commission.

## References

- Acheson, James M., and James A. Wilson. 1996. Order Out of Chaos: The Case for Parametric Fisheries Management. *American Anthropologist* 98 (3): 579–594.
- Anand, Sudhir, and Amartya Sen. 2000. Human Development and Economic Sustainability. *World Development* 28 (12): 2029–2049.
- Anderson, James L., Christopher M. Anderson, Jingjie Chu, Jennifer Meredith, Frank Asche, Gil Sylvia, Martin D. Smith et al. 2015. The Fishery Performance Indicators: A Management Tool for Triple Bottom Line Outcomes. *PLoS One* 10 (5): e0122809.
- Arrow, Kenneth, Partha Dasgupta, Lawrence Goulder, Gretchen Daily, Paul Ehrlich, Geoffrey Heal, Simon Levin et al. 2004. Are We Consuming Too Much? *Journal of Economic Perspectives* 18 (3): 147–172.
- Barber, Willard E. 1988. Maximum Sustainable Yield Lives On. *North American Journal of Fisheries Management* 8 (2): 153–157.
- Barbessaard, Mads. 2018. Blue Growth: Savior or Ocean Grabbing? *The Journal of Peasant Studies* 45 (1): 130–149.
- Bernstein, Steven. 2000. Ideas, Social Structure and the Compromise of Liberal Environmentalism. *European Journal of International Relations* 6 (4): 464–512.
- Beverton, Raymond J. H., and Sidney J. Holt. 1957. On the Dynamics of Exploited Fish Populations. In *Fishery Investigations Series 2: Sea Fisheries*. London, England: MAFF.
- Box, George E. P. 1976. Science and Statistics. *Journal of the American Statistical Association* 71 (356): 791–799.
- Burgess, Matthew G., Michaela Clemence, Grant R. McDermott, Christopher Costello, and Steven D. Gaines. 2018. Five Rules for Pragmatic Blue Growth. *Marine Policy* 87: 331–339.
- Clark, William C., and Nancy M. Dickson. 2003. Sustainability Science: The Emerging Research Program. *Proceedings of the National Academy of Sciences of the United States of America* 100 (14): 8059–8061.
- Costanza, Robert, Lorenzo Fioramonti, and Ida Kubiszewski. 2016. The Unsustainable Development Goals and the Dynamics of Well-Being. *Frontiers in Ecology and the Environment* 14 (2): 59.
- Daly, Herman E. 1990. Toward Some Operational Principles of Sustainable Development. *Ecological Economics* 2 (1): 1–6.
- Daly, Herman, and John Cobb. 1989. *For the Common Good: Redirecting Economy Toward Community, the Environment, and a Sustainable Future*. Boston, MA: Beacon Press.
- Daly, Herman, Brian Czech, David L. Trauger, William E. Rees, Mansi Grover, Tracy Dobson, and Stephen C. Trombulak. 2006. Are We Consuming Too Much—for What? *Conservation Biology* 21 (5): 1359–1362.
- Dauvergne, Peter. 2005. The Environmental Challenge to Loggers in the Asia Pacific. In *The Business of Global Environmental Governance*, edited by David Levy and Peter Newell, 169–196. Cambridge, MA: MIT Press.
- Dauvergne, Peter, and Genevieve LeBaron. 2014. *Protest Inc.: The Corporatization of Activism*. Cambridge, UK: Polity Press.

- Davison, Aidan. 2008. Contesting Sustainability in Theory-Practice: In Praise of Ambivalence. *Continuum: Journal of Media and Cultural Studies* 22 (2): 191–199.
- Doyle, Timothy. 1998. Sustainable Development and Agenda 21: The Secular Bible of Global Free Markets and Pluralist Democracy. *Third World Quarterly* 19 (4): 771–786.
- Eagle, J., and B. N. Thomson. 2003. Answering Lord Petty's Question: Dissecting Regulatory Overfishing. *Ocean and Coastal Management* 46: 649–679.
- Ehrnström-Fuentes, Maria, and Markus Kröger. 2018. Birthing Extractivism: The Role of the State in Forestry Politics and Development in Uruguay. *Journal of Rural Studies* 57: 197–208.
- Farley, Heather M., and Zachary A. Smith. 2013. *Sustainability: If It's Everything, Is It Nothing?* Vol. 5. New York, NY: Routledge.
- Finley, Carmel. 2011. *All the Fish in the Sea: Maximum Sustainable Yield and the Failure of Fisheries Management*. Chicago, IL: University of Chicago Press.
- Finnemore, Martha. 1996. *National Interests in International Society*. Ithaca, NY: Cornell University Press.
- Geček, Sunčana, and Tarzan Legović. 2012. Impact of Maximum Sustainable Yield on Competitive Community. *Journal of Theoretical Biology* 307: 96–103.
- Gibbon, Edward. 1994. *The History of the Decline and Fall of the Roman Empire*. Edited by David Womersley. Vol. 2. London, UK: Penguin.
- Goodland, Robert. 1995. The Concept of Sustainability. *Annual Review of Ecology and Systematics* 26: 1–24.
- Grimmer, Justin, and Brandon M. Stewart. 2013. Text as Data: The Promise and Pitfalls of Automatic Content Analysis Methods for Political Texts. *Political Analysis* 21 (3): 267–297.
- Gunderson, L. H., and C. S. Holling, eds. 2002. *Panarchy: Understanding Transformations in Human and Natural Systems*. Washington, DC: Island Press.
- Haas, P. M., R. O. Keohane, and M. A. Levy, eds. 1993. *Institutions of the Earth: Sources of Effective International Environmental Protection*. Cambridge, MA: MIT Press.
- Hahn, Lance W., and Robert M. Sivley. 2011. Entropy, Semantic Relatedness and Proximity. *Behavior Research Methods* 43 (3): 746–760.
- Hansmann, Ralph, Harald A. Mieg, and Peter Frischknecht. 2012. Principal Sustainability Components: Empirical Analysis of Synergies Between the Three Pillars of Sustainability. *International Journal of Sustainable Development and World Ecology* 19 (5): 451–459.
- Hardin, Garrett. 1995. *Living Within Limits: Ecology, Economics, and Population Taboos*. Oxford, UK: Oxford University Press.
- He, Qin. 1999. Knowledge Discovery Through Co-word Analysis. *Library Trends* 48 (1): 133–159.
- Hempel, Lamont C. 2009. Conceptual and Analytical Challenges in Building Sustainable Communities. In *Toward Sustainable Communities: Transition and Transformations in Environmental Policy*, edited by Daniel A. Mazmanian and Michael E. Kraft, 33–62. Cambridge, MA: MIT Press.
- Hopwood, Bill, Mary Mellor, and Geoff O'Brien. 2005. Sustainable Development: Mapping Different Approaches. *Sustainable Development* 13 (1): 38–52.
- Indulska, Marta, Dirk S. Hovorka, and Jan Recker. 2012. Quantitative Approaches to Content Analysis: Identifying Conceptual Drift Across Publication Outlets. *European Journal of Information Systems* 21 (1): 49–69.

- Jacobs, Michael. 1999. Sustainable Development as a Contested Concept. In *Fairness and Futurity*, edited by Andrew Dobson. Oxford, UK: Oxford University Press.
- Jacques, Peter J., and Zachary A. Smith. 2003. *Ocean politics and policy: A reference handbook*. Santa Barbara, CA: ABC/Clío.
- Jacques, Peter. 2015. *Sustainability: The Basics*. New York, NY: Routledge.
- Jacques, Peter J. 2017. The Origins of Coastal Ecological Decline and the Great Atlantic Oyster Collapse. *Political Geography* 60: 154–164.
- Jarosz, Lucy. 2009. The Political Economy of Global Governance and the World Food Crisis: The Case of the FAO. *Review (Fernand Braudel Center)* 32 (1): 37–60.
- Katzenstein, Peter J. 1996. *The Culture of National Security: Norms and Identity in World Politics*. New York, NY: Columbia University Press.
- Kittinger, John N., Lydia C. L. Teh, Edward H. Allison, Nathan J. Bennett, Larry B. Crowder, Elena M. Finkbeiner, Christina Hicks et al. 2017. Committing to Socially Responsible Seafood. *Science* 356 (6341): 912–913.
- Krasner, Stephen D. 1983. *International Regimes*. Ithaca, NY: Cornell University Press.
- Larkin, P. A. 1977. Epitaph for the Concept of Maximum Sustained Yield. *Transactions of the American Fisheries Society* 106 (1): 1–11.
- Laver, Michael, and John Garry. 2000. Estimating Policy Positions from Political Texts. *American Journal of Political Science* 44: 619–634.
- Lélé, Sharachchandra M. 1991. Sustainable Development: A Critical Review. *World Development* 19 (6): 607–621.
- Levy, David L., and Peter J. Newell, eds. 2005. *The Business of Global Environmental Governance*. Cambridge, MA: MIT Press.
- Lobo, Rafaella, and Peter J. Jacques. 2017. Sofia's Choices: Discourses, Values, and Norms of the World Ocean Regime. *Marine Policy* 78: 26–33.
- Lund, Kevin, and Curt Burgess. 1996. Producing High-Dimensional Semantic Spaces from Lexical Co-occurrence. *Behavior Research Methods, Instruments, and Computers* 28 (2): 203–208.
- Mannheim, Karl. (1936) 1972. *Ideology and Utopia: An Introduction to the Sociology of Knowledge*. London, UK: Routledge and Kegan Paul.
- Marko, Peter B., Sarah C. Lee, Amber M. Rice, Joel M. Gramling, Tara M. Fitzhenry, Justin S. McAlister, George R. Harper, and Amy L. Moran. 2004. Fisheries: Mislabelling of a Depleted Reef Fish. *Nature* 430 (6997): 309–310.
- Marx, Karl. (1867) 1909. *Capital: A Critique of Political Economy*. Edited by Friedrich Engels. Chicago, IL: C. H. Kerr.
- McCormack, Fiona. 2017. Sustainability in New Zealand's Quota Management System: A Convenient Story. *Marine Policy* 80: 35–46.
- Meadows, Donnella, Jorgen Randers, and Dennis Meadows. 2004. *Limits to Growth: The 30-Year Update*. White River Junction, VT: Chelsea Green.
- Morato, Telmo, Reg Watson, Tony J. Pitcher, and Daniel Pauly. 2006. Fishing Down the Deep. *Fish and Fisheries* 7 (1): 24–34.
- Newell, Peter. 2008. The Political Economy of Global Environmental Governance. *Review of International Studies* 34 (3): 507–529.
- Okereke, Chukwumerije. 2008. Equity Norms in Global Environmental Governance. *Global Environmental Politics* 8 (3): 25–50.
- Okereke, Chukwumerije, Harriet Bulkeley, and Heike Schroeder. 2009. Conceptualizing Climate Governance Beyond the International Regime. *Global Environmental Politics* 9 (1): 58–78.

- Okey, Thomas. 2003. Membership of the Eight Regional Fishery Management Councils in the United States: Are Special Interests Over-represented? *Marine Policy* 27 (3): 193–206.
- Paterson, Matthew. 1996. *Global Warming and Global Politics*. London, UK: Routledge.
- Pauly, Daniel, and Maria-Lourdes Palomares. 2005. Fishing Down Marine Food Web: It Is Far More Pervasive Than We Thought. *Bulletin of Marine Science* 76 (2): 197–212.
- Pauly, Daniel, and Dirk Zeller. 2016. Catch Reconstructions Reveal That Global Marine Fisheries Catches Are Higher Than Reported and Declining. *Nature Communications* 7: 10244. doi:10.1038/ncomms10244.
- Pitcher, Tony J. 1998. A Cover Story: Fisheries May Drive Stocks to Extinction. *Reviews in Fish Biology and Fisheries* 8 (3): 367–370.
- Princen, Thomas. 2003. Principles for Sustainability: From Cooperation and Efficiency to Sufficiency. *Global Environmental Politics* 3 (1): 33–50.
- Ruggie, John Gerard. 1982. International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order. *International Organization* 36 (2): 379–415.
- Scalia, Massimo, Sergio Barile, Marialuisa Saviano, and Francesca Farioli. Forthcoming. Governance for Sustainability: A Triple-Helix Model. *Sustainability Science*.
- Schnaiberg, Allan. 1980. Environment: From Surplus to Scarcity. In *Environment: From Surplus to Scarcity*. Oxford, UK: Oxford University Press.
- Seghezze, Lucas. 2009. The Five Dimensions of Sustainability. *Environmental Politics* 18 (4): 539–556.
- Skern-Mauritzen, Mette, Geir Ottersen, Nils Olav Handegard, Geir Huse, Gjert E. Dingsør, Nils C. Stenseth, and Olav S. Kjesbu. 2016. Ecosystem Processes Are Rarely Included in Tactical Fisheries Management. *Fish and Fisheries* 17 (1): 165–175.
- Stephenson, Robert L., Ashleen J. Benson, Kate Brooks, Anthony Charles, Poul Degnbol, Catherine M. Dichmont, Marloes Kraan, Sean Pascoe, Stacey D. Paul, Anna Rindorf, and Melanie Wiber. 2017. Practical Steps Toward Integrating Economic, Social and Institutional Elements in Fisheries Policy and Management. *ICES Journal of Marine Science* 74 (7): 1981–1989.
- Stienstra, Deborah. 1999. Of Roots, Leaves, and Trees: Gender, Social Movements, and Global Governance. In *Gender Politics in Global Governance*, edited by Mark Meyer and Elisabeth Prugl, 260–272. Lanham, MD: Rowman and Littlefield.
- Tijmes, Pieter, and Reginald Luijf. 1995. The Sustainability of Our Common Future: An Inquiry into the Foundations of an Ideology. *Technology in Society* 17 (3): 327–336.
- United Nations Food and Agricultural Organization. 2014. *The State of World Fisheries and Aquaculture (SOFIA)*. Available at: [www.fao.org/fishery/sofia/en](http://www.fao.org/fishery/sofia/en), last accessed March 7, 2016.
- United Nations Food and Agriculture Organization. 2016a. *FAO's Response to the Nature Communications Article "Catch Reconstructions Reveal That Global Marine Fisheries Catches Are Higher Than Reported and Declining"*. Rome, Italy: United Nations Food and Agriculture Organization. Available at: <http://www.fao.org/3/a-bc417e.pdf>
- United Nations Food and Agriculture Organization. 2016b. *The State of the World's Fisheries and Aquaculture*. Rome, Italy: United Nations Food and Agriculture Organization.
- Valentin, Anke, and Joachim H. Spangenberg. 2000. A Guide to Community Sustainability Indicators. *Environmental Impact Assessment Review* 20 (3): 381–392.

- Wanner, Thomas. 2015. The New “Passive Revolution” of the Green Economy and Growth Discourse: Maintaining the “Sustainable Development” of Neoliberal Capitalism. *New Political Economy* 20 (1): 21–41.
- Webster, D. G. 2013. International Fisheries: Assessing the Potential for Ecosystem Management. *Journal of Environmental Studies and Sciences* 3 (2): 169–183.
- World Commission on Environment and Development. 1987. *Our Common Future*. Oxford, UK: Oxford University Press.
- Xu, Zhi, and David N. Bengston. 1997. Trends in National Forest Values Among Forestry Professionals, Environmentalists, and the News Media, 1982–1993. *Society and Natural Resources* 10 (1): 43–59.
- Young, Oran R. 1982. *Resource Regimes: Natural Resources and Social Institutions*. Berkeley, CA: University of California Press.