Marine Policy 106 (2019) 103515

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

# Does the European Union achieve comprehensive blue growth? Progress of EU coastal states in the Baltic and North Sea, and the Atlantic Ocean against sustainable development goal 14

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ARTICLE INFO

*Keywords:*
Sustainable development goals
Blue growth
European Union
Fisheries

ABSTRACT

The Sustainable Development Goal for the oceans and coasts (SDG 14) as part of the 2030 Agenda can be considered as an important step towards achieving comprehensive blue growth. Here, we selected a set of 18 indicators to measure progress against SDG 14 for 15 EU coastal countries in the Baltic and the North Sea and the Atlantic Ocean since 2012. In our assessment we distinguish between a concept of weak and strong sustainability, assuming high and low substitution possibilities, respectively. Our results indicate that there are countries which managed to achieve sustainable development under both concepts of sustainability (most notably Estonia, achieving the strongest improvement), but that there are also countries which failed to achieve sustainable development under both concepts (most notably Ireland and Belgium, experiencing the strongest decline). Unsustainable development is in particular driven by increasing fishing mortality and reduced willingness to set total allowable catch in accordance with scientific advice.

## 1. Introduction

Achieving economic growth and development while maintaining the natural assets base is considered to be essential for sustaining inclusive well-being. In this regard, the terms *blue economy* and corresponding *blue growth* have recently entered the debate to highlight the importance of ocean resources and services [1]. For example, the European Commission has launched a blue growth initiative to properly acknowledge the seas and ocean as drivers for the European economy, innovation and growth [2] and the Organisation for Economic Co-operation and Development (OECD) has launched a report to explore the growth, employment, and innovation prospects of the ocean economy by 2030 [3]. Despite clearly acknowledging the importance of sustaining the natural resource base, the focus of such initiatives and reports appears to be rather on economic growth and employment, raising the question how comprehensive their approach to blue growth actually is. Growth in the ocean economy has in particular arisen from improved access to, utilization of, and production efficiency from ocean resources and services [4]. However, poorly regulated open access regimes are considered a key reason for sub-optimal and non-sustainable ocean resource use [5,6]. Against this background, the inclusion of a specific United Nations (UN) Sustainable Development Goal for the oceans and coasts (SDG 14) as part of the 2030 Agenda can be considered as an important step towards achieving more comprehensive blue growth, encouraging the development of sustainable and resilient coastal communities.

Since the adoption of the 2030 Agenda by the United Nations General Assembly in 2015 [7], a few initial assessments have been published to measure the progress over and against the overall SDG goals and associated targets. However, these assessments have so far rather focused on terrestrial resources [8] or have omitted the ocean in their assessment of trade-offs and synergies among the SDGs [9] because of poor data availability for indicators associated with SDG 14 in the SDG Global Indicator Database. Singh et al. [10] circumvent the problem of missing indicators by combining two experts assessments (one in a workshop format, including an assessment of knowledge from the literature and one with an external expert review of workshop outcome) to identify and assess the co-benefits and trade-offs between the targets of SDG 14 and all other SDGs (excluding SDG 17). Another exemption is the study of Rickels et al. [11] who select indicators themselves to provide an initial assessment of the state of SDG 14 for EU coastal countries. However, by definition sustainable development

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https://doi.org/10.1016/j.marpol.2019.103515
Received 8 September 2018; Received in revised form 9 April 2019; Accepted 1 May 2019
Available online 14 May 2019

requires assessment over time. Here, we extend the analysis of [11], providing an assessment of sustainable ocean development for EU coastal countries as defined by SDG 14. The comparison over time provides not only important information but does also circumvent intrinsic limitations in the results of their study arising from transformation and aggregation.

Blue growth (to achieve a blue economy) aims at providing employment and livelihoods, and promoting social inclusion while at the same time the marine resource base is sustained [12]. Theoretically, this sustainability requirement could be formalized in the context of the capital approach by demanding that the production potential of nature and the economy—the endowment with capital stocks—to be constant or incremental over time [13–15]. However, in this approach, sustainability is evaluated on the basis of the aggregate capital stock, implying that substitution between the various human-made, social, and natural (marine) capital stocks is feasible. However, the feasibility of substituting various capital stocks (and in particular natural capital by manufactured capital) might be limited for ecological or technical reasons or because social preferences only allow substitution to a limited extent [16,17]. These considerations regarding the limits for the feasibility of substitution are reflected in the distinction between strong and weak sustainability. Weak sustainability allows for substitution between the capital stocks while strong sustainability allows substitution only for a very limited extent, implying that under weak sustainability only the aggregate of the various capital stocks (weighted by their shadow prices) has to be maintained to achieve sustainable development whereas strong sustainability requires to maintain individual capital stocks [14,18–27]. In particular in the context of complex ecological-human interactions like the human-ocean system, limited substitution possibilities satisfying a rather strong sustainability concept appear more appropriate to account properly of the influence of various aspects of sustainable ocean development [5,11,28].

Accounting for limited substitution possibilities is not restricted to the theoretical framework of the capital approach but is an essential element of social choice theory [29]. Building on this theory, Dovern et al. [30] show how different indicators, reflecting various dimensions of sustainable development can be meaningful aggregated after appropriate transformation by applying a generalized mean. The generalized mean allows assessing the sensitivity of aggregated scores with respect to the feasibility of substitution between different dimensions of sustainable development, whereas the sensitivity can be interpreted in the context of weak and strong sustainability (in the style of the capital approach). However, the various dimensions of sustainable development reflected by the underlying indicator set do not necessarily share unique substitution possibilities. One would probably argue that the substitution possibilities between number of jobs in the fisheries sector and number jobs in the tourism sector are better than between the number of jobs and a measure for the health of marine ecosystems. For that reason, Dovern et al. [30] propose to apply a nested composite indicator with different substitution possibilities at different layers, first aggregating those indicators with better substitution possibilities and assume less optimistic substitution elasticities at the top level of aggregation. Here, in the context of the SDGs with targets and corresponding indicators, we assume that there are better substitution possibilities between indicators assigned to a specific target (allowing calculating a composite indicator at the target level) than between targets which are then aggregated into a composite indicator at the SDG level.

The indicators for assessing progress against the 2030 Agenda are given by the Global Indicator Framework which has been and is still further developed by the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) [7]. Formed by the United Nations Statistical Commission [31] in March 2015, the IAEG-SDGs consists of national statistical offices taking a leading role while regional and international organizations and agencies act as observers. The first version of the proposed Global Indicator Framework consisted of 300 indicators and has been reduced to 232 indicators as a result of ongoing consultation [32,33]. The set of indicators is supposed to be refined annually, complemented by indicators on a regional and national level and reviewed in 2020 and 2025 [34]. To facilitate the implementation of the Global Indicator Framework, each indicator is classified in a tier system. The tier system consists of three tiers that depend on methodological development and the availability of data at the global level [35]: Tier 1: Indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50% of countries and of the population in every region where the indicator is relevant; Tier 2: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries; and Tier 3: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested. Since methodologies are developed and data availability increases, the classification of indicators tends to change and is reviewed bi-monthly by the IAEG-SDGs. As of May 2018, the Global Indicator Framework consists of 93 Tier 1 indicators, 72 Tier 2 indicators and 62 Tier 3 indicators.

Currently, only for two of the indicators assigned to the targets of SDG 14 official data is available for cross-country comparison [36]. Accordingly, Pradhan et al. [9] has to leave out SDG 14 in their correlation analysis between different indicators to identify synergies and trade-offs between SDGs. Rickels et al. [11] analyze SDG14 for EU coastal countries in detail, selecting indicators by themselves to approximate progress against the various targets related to SDG14. As explained above, they analyze the performance against the target and SDG level by applying a generalized mean as composite indicator. However, even though Rickels et al. [11] follow official guidelines for selecting indicators, the final selection always involves a normative choice with important implications for the overall assessment [37]. Furthermore, without officially defined reference values for certain indicators, high or low scores might rather provide information about the skewness of the indicator distribution than about the actual state of sustainable ocean development. Clearly, our modification and updating of the approach by [11] cannot fully overcome these structural limitations as only for two indicators official data is available. However, by focusing on the change of indicators over time, various problems related to standardization and selection are mitigated as the focus on change between two different points in time allows for a more robust assessment of sustainable development than an assessment of the state at given point in time. Another problem of the assessment by [11] is that they rely for four indicators on data from the International Council for the Exploration of the Sea (ICES). The ICES data covers the Baltic Sea, the North Sea, and the Atlantic Ocean, but not the Mediterranean Sea. Accordingly, no value for these four indicators is assigned to Mediterranean EU coastal countries, implying that the other indicators have a higher weight in the aggregated score in the assessment of [11] for Mediterranean EU coastal countries. Depending on whether these four indicators rank relatively high or low compared to the other indicators (for those countries where data is available), the inclusion of these indicators results somewhat in a bias, giving an advantage or disadvantage to ICES countries, respectively. Here, we restrict our assessment to ICES countries, reducing on the one hand our coverage of EU coastal countries but again increasing the robustness of the assessment.

The paper is structured as follows. Section 2 introduces our method to assess sustainable ocean development for 15 (selected) EU Coastal countries by comparing the most recently available information against a 2012 baseline. Section 2.1 explains the indicator selection and transformation and Section 2.2 explains the indicator aggregation. The results are presented in Section 3, discussing first the results for the ocean state (Section 3.1) and second the results for ocean development (Section 3.2). Section 4 concludes.

## 2. Method

SDG14 includes ten targets, 14.1 to 14.7 and 14.a to 14.c whereby the last three targets aim specifically at implementation (Means of Implementation targets). The Global Indicator Framework assigns two indicators to target 14.1, for all others only one indicator. However, for target 14.6 and 14.b the indicators are composite indicators, aggregating three indicators each. The Global SDG Indicators Database currently provides cross-country information only for two indicators associated with SDG14 [36]. Accordingly, further indicators need to be selected to measure progress against SDG14. For each target we selected at least two indicators (excluding target 14.2), including the two indicators from the Global SDG Indicator Database. For target 14.1 we selected three indicators because we measure progress against marine plastic pollution by two indicators (which are then aggregated into a composite indicator). The indicators are aggregated at the target level and at the SDG level, allowing tracking changes on different levels of aggregation. We aim for assessing sustainable ocean development by comparing two points in time: the most recent ocean status against the status in 2012.

### 2.1. Indicator selection and transformation

The selection, normalization, weighting, and aggregation of indicators involves subjective and normative choices with important implications for the results [37,37,38]. Guidance is provided by best practice examples and scientific rules while the latter applies in particular to the meaningful normalization and aggregation of indicators [38–40] (see Section 2.2 on indicator aggregation). Conceptual frameworks and best practice guidance for the indicator selection are provided for example by Niemeijer and Groot [41] who suggest to follow the SMART (specific, measurable, achievable, relevant and time-bound) criteria or by Krellenberg et al. [37] who outline an ideal process of indicator selection. Several further characteristics for appropriate indicator selection have been discussed and suggested in the literature. Böhringer and Jochem [38] list five key requirements, including i) a rigorous connection to the sustainability definition or goal, ii) meaningfulness to the holistic nature of sustainable development goals, iii) measurability, iv) process oriented selection, and v) the possibility of deriving political objectives.[1] Following these guidelines and examples prevents an arbitrary indicators selection but cannot circumvent the normative judgement involved in selecting or neglecting indicators. Including an additional indicator reduces the weights given to the already included indicators while neglecting an indicator does not only imply that this aspect of sustainability receives zero weight but also that the remaining indicators are assigned a higher weight.

Our selection of indicators was guided by the UN Global Indicator Framework. However, the Global Indicator Framework lacks a clear foundation in the capital approach and a well-defined distinction between pressure, state, and response indicators [11]. Furthermore, Mair et al. [42] criticize that the indicators of the Global Indicator Framework do not fully reflect the various dimensions and aspects of sustainable development and that a meaningful application of the indicators requires to account for their shortcomings. However, given the normative character of the overall framework, an unanimously supported scientific solution is not likely to materialize [43] and obtaining a meaningful indicator requires therefore a iterative decision-making process with the involvement of three actors, statistics, science, and politics [44]. The IAEG-SDGs and the UNSC indicator selection process was organized as such an inclusive, open and transparent process, including actors from statistics, science and politics, providing therefore a strong legitimization for using these indicators as guidance in constructing our indicators framework. Still, various proposed indicators corresponding to SDG14 in the Global Indicator Framework rather aim at measuring a specific state of marine resources (Target 14.1, proposed indicator: Index of coastal eutrophication and floating plastic debris density, Target 14.3, proposed indicator: Average marine acidity (pH) measured at representative sampling stations, and Target 14.5, proposed indicator: Proportion of fish stocks within biologically sustainable levels), preventing to assess the individual country's contribution and therefore progress. Here, we aimed at choosing indicators allowing to measure country's contribution (e.g., country's carbon emission instead of average marine acidity) or calculating the indicators such that country's contribution is accounted for (i.e., indicators related to sustainability of fisheries are calculated for each country as catch-weighted average, measuring the country's contribution to the state of the specific fish stock).

Furthermore, for those indicators not yet provided by the Global Indicator Framework we aimed for using data from official sources like Eurostat, World Bank, OECD, ICES, or the Ocean Health Index (OHI) to ensure measurability, achievability, and therefore reproducibility. ICES provides various information for European fish stocks and we used information on the relationship of the estimated biomass and fishing mortality to the corresponding critical levels indicating that maximum sustainable yield is maintained. For those fish stocks where information on these critical levels is missing, we used reference levels related to the precautionary approach or the absolute lower limit value (e.g., $B_{pa}$ and $B_{lim}$, respectively). Furthermore, we used information on ICES estimates landings (catch), total allowable catch (TAC), and scientific advice (SAD) to assess whether total landings comply with TAC (TAC/Catch) and whether TAC is set in accordance with SAD (SAD/TAC). Overall, we obtained four indicators from the ICES database, covering 79 fish stocks. We restricted the assessment to fish stocks where an analytical stock assessment is available and where the biomass is measured as spawning-stock biomass (SSB and SSB/45 cm) or as ratio between biomass and the reference value for maximum sustainable yield biomass (B/BMSY). One exemption is the eastern Baltic cod where biomass information is only provided by a biomass index. Here, we could calculate only two indicators, TAC/Catch and SAD/TAC. The additional inclusion of the eastern Baltic cod is required to calculate the indicators for the western Baltic cod.

The OHI, introduced in 2012 by Halpern et al. [45] and subsequently updated annually, includes ten public ocean-related goals and assesses the performance of 171 countries against these goals. While the index applied is restricted to a concept of weak sustainability and leaves therefore out issues related to the aggregation of conflicting goals, the large amount of data collected and calculated for the OHI represents a unique data source for cross-country comparison of sustainable ocean development [5,28]. However, the indicator values for the goals and sub-goals in the OHI are not only based on the present status but also include the future status derived from the assessment of the pressure on, and the resilience of, the human-ocean system. Information on pressure and resilience is used for several goals, amplifying tracking actual development of the state across the various goals. For that reason we only used the information on the current state as indicators in our assessment, except for the OHI goal Artisanal Fishing Opportunities (which we use as indicator for Target 14.b) because here we exactly want to account for the various pressures affecting small-scale fishing opportunities.

We have not selected any indicators to measure progress against target 14.2 which is supposed to be measured by the indicator *Proportion of national exclusive economic zones managed using ecosystem-based approaches,* but is not yet available (Tier 3). Integrated ecosystem-based management (EBM) is considered to be crucial to overcome the so far largely fragmented and therefore potentially socially inefficient existing management of ocean and coastal resources [4,46]. Yet, progress against the application of EBM approaches is expected to be achieved at the EU level. The EU Maritime Spatial Planning directive,

[1] We would like to thank an anonymous reviewer who provided the neat summary of the key requirements listed by [38].

including EBM, came into force in 2014 and aims to be implemented by all countries in 2021 [47]. Accordingly, we could not identify any related indicator which provides information for a cross-country assessment against this target of SDG14 for the EU.

Following Ebert and Welsch [39], we aimed at ratio-scale, fully comparable indicators and decided to range them between 0 and 100. The indicators obtained from OHI indicators are already ratio-scale full comparable and the indicators based on ICES and World Bank data have been calculated to fulfill this property. For those indicators not yet available as ratio-scale fully comparable indicators we apply either the distance-to-reference (dis-ref) transformation or max-min transformations (max-min) (OECD 2008). For three indicators, *#3 CO2 Compliance*, *#7 MPA/EEZ*, and *#17 IMO Participation Rate*, we have chosen exogenous targets values for the normalization. The indicator *#3 $CO_2$ Compliance* measures those $CO_2$ emissions which are covered under the EU Effort Sharing Decision (ESD) (i.e. outside of the European Emission Trading Scheme) where exogenous country-specific targets are defined (which were obtained from Eurostat database). The indicator *#7 MPA/EEZ* could have been assessed against the UN target level of 10%. However, the German Advisory Council on Global Change [48] argues that the system of marine protected areas should cover at least 20–30% to properly reflect (and protect) the various marine ecosystems. We follow Brandi [49] who points out that given the importance of marine biodiversity for ecosystem services more ambitious target levels would be more in line with the aspirational nature of the 2030 Agenda and we have chosen 30% as reference target value. Both, Belgium and Germany achieve a perfect score of 100 at this indicator, showing that the reference value is well achievable. The indicator *#17 IMO Participation Rate* is calculated as the participation rate in international sea protocols of the IMO and we have chosen the maximum number of sea protocols as target value.

Regarding the application of the max-min transformation one needs to keep in mind that high or low scores might not necessarily indicate a good or poor state. However, as the determination of the maximum and minimum values of the original data not only included the countries in our assessment but all countries in the EU or even Europe, one can interpret the maximum value as kind of a best-practice reference value. For example, for indicator *#13 Marine Research* the reference value in the standardization is given by Norway which spends 3.6% of its total expenditure for marine research and development. Among the countries in our assessment, France has the highest expenditures, spending 0.8% for ocean science. Accordingly, the highest score in our assessment is obtained by France which still scores relative low (22 points) compared to Norway. Furthermore, for *#1 Gross Nitrogen Balance* one could ask whether country-specific reference values would be more appropriate, accounting for the agricultural structure in the country. However, this might be an option for a more comprehensive assessment of sustainable development where aspects like food provision are considered. Here, with focus on marine pollution we believe that the minimum and maximum values across countries in Europe provide a good reference with respect to nitrogen pollution, indicating the so far still very different performance of countries against this target.

The comprehensive information about the indicator selection and transformation is provided in the *Supplementary Information A*. The complete dataset, including the untransformed and transformed data are provided in *Supplementary Information* B. The selection and transformation of indicators is summarized in Table 1.

### 2.2. Indicator aggregation

Given our ratio-scale full comparable indicators, $I_{it}$, meaningful aggregation of $N$ indicators into a composite indicator $CI_t$ is obtained according to social choice theory by applying a generalized mean [29]:

$$CI_t(a_{it}, I_{it}, \sigma) = \left(\sum_{i=1}^{N} \alpha_{it} I_{it}^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}, \text{ for } t = 2012,\ 2018(most\ recent), \quad (1)$$

with weights $\alpha_{it} > 0$ and $0 \leq \sigma \leq \infty$. The parameter $\sigma$ is used to quantify the *elasticity of substitution* between the different indicators [29]. High (low) values for $\sigma$ imply good (poor) substitution possibilities which means that the low score in one indicator can very well (not well) compensated by a good score in another indicator. Consequently, high and low values for $\sigma$ correspond to concepts of weak sustainability and strong sustainability, respectively. In dependence on σ, one can obtain a full class of specific function forms for the composite indicator as summarized in Fig. 1.

In our assessment we have selected at least two indicators for each target (for plastic pollution we have selected two indicators, *#2a* and *#2b*). The indicators corresponding to a certain target have been selected to measure progress against this specific target. Accordingly, we assume that the substitution possibilities between indicators assigned to the same target are sufficiently higher than the substitution possibilities between different targets which represent very different dimensions of ocean health. Accordingly, we follow Dovern et al. [30] and apply a nested composite indicator with different substitution possibilities at different layers to aggregate the selected indicators. The nesting structure reflects the SDG framework by having first an indicator level, second a target level, and third an SDG level. Consequently, for the case of plastic pollution we calculate a composite indicator by using (1) to aggregate #2a and #2b. The obtained composite indicator plastic pollution (#2) is then aggregated with #1 *Gross Nitrogen Balance* by using again (1), to achieve a composite indicator for the Target 14.1 (i.e. the target score for 14.1). The nine target scores, each calculated as composite indicators, are then finally aggregated by using again (1) to achieve the SDG score (which is a composite indicator of the target scores). As explained above, we assume that the targets reflect very different aspects of sustainable ocean development and accordingly we distinguish in the aggregation between low and high substitution possibilities, allowing assessing and comparing progress under a concept of strong and weak sustainability.

Contrasting aggregation scores obtained under two concepts of sustainability provides a good measure to identify unbalanced performances across targets because the score under the concept of strong sustainability is more sensible to negative outliners. However, aggregation under the assumption of weak sustainability results in higher scores expect for the special case where all scores at the target level are equal. Accordingly, comparing the ranking information under the two concepts of sustainability provides straightforward information about the balance of scores across targets for the countries because a country with a balanced performance ranks higher than a country with unbalanced performance under the concept of strong sustainability. Unlike increasing the weighting of a specific indicator or target to emphasize its importance for sustainable development (assigning for example a higher weight to biodiversity aspects), decreasing the substitution possibilities reflects in general a stronger preference for a balance performance across the indicators or targets.

While adjusting the weights requires interactions with stakeholders or expert workshop like in Singh et al. [10], scientific guidelines exist for the specification of the substitution elasticity. Measuring development against the concept of strong sustainability requires choosing a substitution elasticity value below 1 [50–53]. We did not deviate from an equal weighting scheme at the different aggregation levels because we could not build on input from stakeholders or an expert workshop, but we applied different values for the elasticity of substitution. As explained above, we assume that the substitution possibilities between indicators corresponding to a specific target are higher than the substitution possibilities between targets. Consequently, we calculated the target scores under the assumption $\sigma_{Target} > 1$ and the overall SDG score under the assumption $\sigma_{SDG} \leq 1$. However, we included an additional

**Table 1**
Indicator selection and transformation for EU ocean sustainable development assessment.

| UNSC Indicator (description) | Selected Indicator | Unit, Source, Transformation, Comparison Years |
|---|---|---|
| **Target 14.1** Pollution | | |
| Index of coastal eutrophication and floating plastic debris density | *#1 Gross Nitrogen Balance* | Nitrogen in kg/ha, Eurostat, max-min, 2012 v. 2014 |
| | *#2a Plastic Waste* | Kg *per capita*, Eurostat, max-min, 2012 v. 2014 |
| | *#2b Plastic Waste Recovery Rate* | Percent, Eurostat, no trans, 2012 v. 2015 |
| **Target 14.2** Ecosystem-Based Management | | |
| Proportion of national EEZ managed using ESB approaches | No indicator selected | |
| **Target 14.3** Acidification | | |
| Av. marine acidity (pH) measured at representative sampling stations | *#3 CO2 Compliance* | GHG emissions in ESD sectors relative to target, Eurostat, dis-ref, 2012 v.2016 |
| | *#4 CO2 per Capita* | kg, Eurostat, max-min, 2012 v. 2016 |
| **Target 14.4** Sustainable Fishing | | |
| Proportion of fish stocks within biologically sustainable levels | *#5 FMSY/F* | catch-weighted average of fishing mortality (F), Min(1,$F_{ref}$/F), ICES, no further trans, 2012 v. 2016 |
| | *#6 B/BMSY* | catch-weighted average biomass (B), Min(1, B/$B_{ref}$), ICES, no further trans, 2012 v. 2016. |
| **Target 14.5** Protection | | |
| Coverage of protected areas in relation to marine areas | *#7 MPA/EEZ* | Percentage, UNSD, dis-ref with target 30%, 2016 |
| | *#8 Biodiversity (OHI)* | Score, OHI, no trans, 2012 v. 2017 |
| **Target 14.6** Incentives | | |
| Instruments aiming to combat illegal, unreported and un-regulated (IUU) fishing | *#9 Fisheries Subsidies* | Percent in relation to value of landings, OECD, max-min, 2012 v. 2016 |
| | *#10 TAC/Catch* | catch-weighted average of landings exceeding TAC, Min(1, TAC/Catch), ICES, no further trans, 2012 v. 2016 |
| **Target 14.7** Economics | | |
| Sustainable fisheries as a percentage of GDP | *#11 Livelihoods& Economics (OHI)* | Score, OHI, no trans, 2012 v. 2017 |
| | *# 12 Tourism (OHI)* | Score, OHI, no trans, 2012 v. 2017 |
| **Target 14.a** Science | | |
| Research budget allocated to marine technology | *#13 Marine Research* | Research budget share for marine research, UNSD, max-min, 2009 v. 2013 |
| | *#14 SAD/TAC* | catch-weighted average of TAC exceed scientific advice, Min(1, SAD/TAC), ICES, no further trans, 2012 v. 2016 |
| **Target 14.b** Small Scale Fishing | | |
| legal/regulatory/policy/institutional framework to recognize/protect access for small scale fisheries | *#15 AFO (OHI)* | Score, OHI, no trans, 2012 v. 2017 |
| | *#16 Fish Species Threatened* | Percentage, World Bank, no trans., 2012 v. 2017 |
| **Target 14.c** Marine Agreements | | |
| Progress in ratifying, accepting and implementing ocean-related instruments that implement international law | *#17 IMO Participation Rate* | Rate, IMO, dis-ref with target: max number protocols, 2018. |
| | *#18 MSDF Measures* | Rate of appropriate measures, EC, no trans, 2018. |

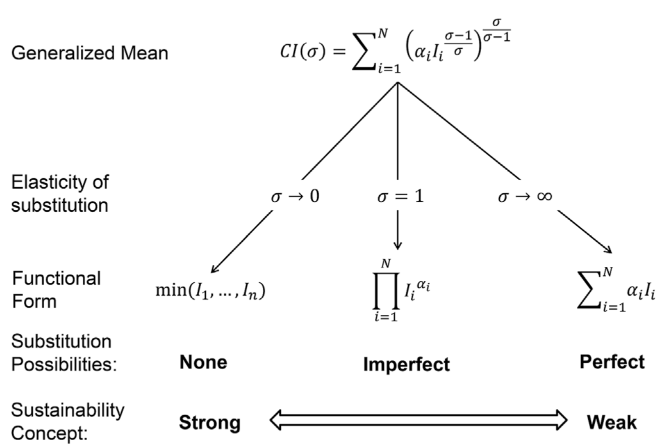


**Fig. 1.** Special functional forms of the generalized mean in dependence of the elasticity of substitution and the corresponding substitution possibilities and sustainability concepts (from Rickels et al. [11]).

calculation of the target scores under the assumption $\sigma_{Target} < 1$ to assess the sensitivity of our assumption of good substitution possibilities between indicators assigned to a target. For $\sigma_{Target} > 1$, we followed Dovern et al. [30] and set $\sigma_{Target} = 10$. For $\sigma_{Target} < 1$, we followed Sterner and Persson [54] and set $\sigma_{Target} = 0.5$. Dovern et al. [30] propose the value in their assessment of the sustainable development of German cities for indicators with rather good substitution possibilities and Sterner and Persson [54] propose the value in their study on the human-climate system. For the overall aggregation to obtain the SDG score we restricted the analysis to $\sigma_{Target} = 10$. Instead of choosing a specific value for $\sigma_{SDG}$, we assume $\sigma_{SDG} \sim U(0,1)$ [11,28,30]. The aggregation at the SDG level is carried out by a Monte Carlo simulation (N = 10,000). For comparison to an aggregation under a concept of weak sustainability we assume here the extreme case of perfect substitution possibilities ($\sigma \to \infty$), implying that (1) simplifies to the arithmetic mean (see Fig. 1). The calculation of aggregated scores, including the Monte-Carlo simulation has been carried out with *Mathematica 10.3.* and the corresponding file is part of *Supplementary Information* B.

The aggregation at the SDG level, $CI_{SDG,t}$, provides information about the state of ocean resources and services in the selected EU coastal countries, i.e. *EU Ocean State*, the comparison over time, $\Delta CI_{SDG} = CI_{SDG,2018} - CI_{SDG,2012}$, provides information about the development of ocean resources and services in the selected EU coastal countries, i.e. *EU Ocean Development*, allowing to assess whether the development has been sustainable ($\Delta CI_{SDG} \geq 0$).

## 3. Results and discussion

### 3.1. EU ocean state

Fig. 2 shows the maximum, minimum, and EEZ-weighted average scores at the indicator and target level for 2018 (upper and lower panel, respectively). Notably, are the low scores for the indicator *#13 Marine Research* and a rather large spread between maximum and minimum scores for *#1 Gross Nitrogen Balance*, *#4 CO2* (emissions) *per Capita*, *#7 MPA/EEZ*, and *#18 MSFD Measures*.

The aggregation under the alternative specification with $\sigma_{Target} = 0.5$

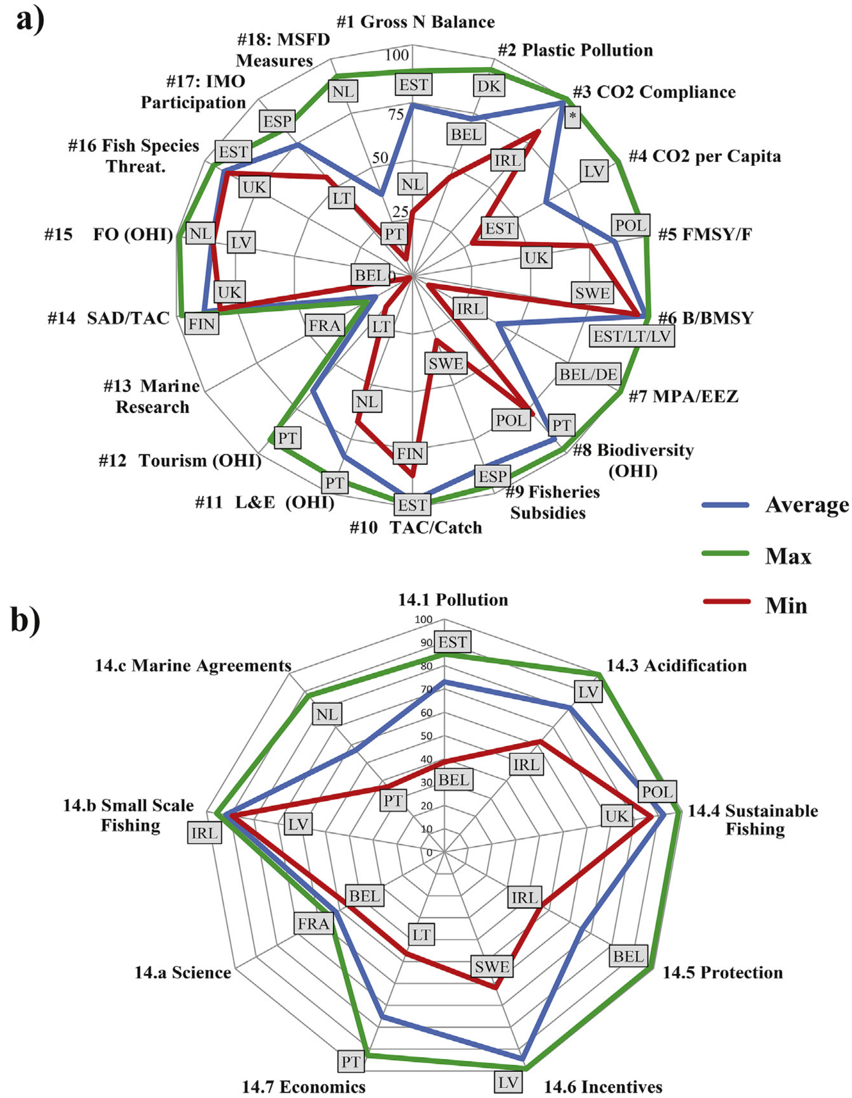


**Fig. 2.** Ocean State of EU Coastal Countries at the Indicator and Target Level with $\sigma = 10$. The figure shows the EEZ-weighted average, the maximum, and minimum scores for indicators (a) and targets (b) for the most recent available information under high substitution possibilities. In the upper panel (a), the max score for Indicator *#3 CO2 Compliance* (*) is shared by EST/ESP/LT/LV/NL/POL/PT/SWE/UK.

is shown in Fig. 3. As expected, the reduction in scores is strongest for countries with a poor performance as the possibility to compensate for a poor score in a specific indicator is reduced while the countries with strongest performance are rarely affected. For Target 14.3 (Acidification) we even observe a change in the ordering of countries. While with high substitution possibilities, Ireland scores lowest among all countries, with low substitution possibilities, Estonia scores lowest (Ireland achieves a score of 62 and 56 and Estonia a score of 63 and 45 under high and low substitution possibilities, respectively). Estonia has the lowest score of all countries in *#4 CO2 per capita* (29) but a perfect score in the compliance with the EU target for $CO_2$ emissions outside the EU ETS (*#3CO2 Compliance,* 100). On the contrary, Ireland achieves for these two indicators scores of 43 and 82 (for *#4* and *#3*, respectively), making Ireland less sensitive to a reduction in the substitution possibilities than Estonia in this specific target. However, even though the two countries change the order in the ranking when reducing the substitution possibilities, the absolute difference in scores under high substitution possibilities does not give a strong advantage to Estonia relative to Ireland. Furthermore, for all other targets the strongest and poorest performing countries remain unchanged and we focus in our analysis of the aggregation at the SDG level on the case with high substitution possibilities at the target level. Still, it needs to be kept in mind that we are therefore allowing countries within targets to compensate for a relative poor performance in an indicator by a strong performance in another indicator. Consequently, any assessment requires also analyzing the indicator level because in case of low scores not explained by miss-selection or –specification, the poor performance might be somewhat hidden at the target level (under high substitution possibilities).

We conclude that overall the EU coastal countries in our assessment perform rather well at the different targets defined by SDG14 expect for expenditures in *#13 Marine Research*. Still, there is sufficient variation in scores across countries resulting in ranking of countries which can be compared under the two concepts of sustainability (Fig. 4).

Countries above the 45° line in Fig. 4 rank better under a concept of weak sustainability which allows them to compensate for a poor performance in one or more targets by a good performance in other targets. Countries below the 45° line rank better under a concept of strong sustainability, indicating that these countries have a relative balanced performance across targets compared to other countries. Taking for example Portugal which ranks worse under a concept of strong sustainability compared to a concept of weak sustainability. Portugal has among the countries the strongest spread between the best and worst performing target at both assessment dates (in 2012 Portugal achieves

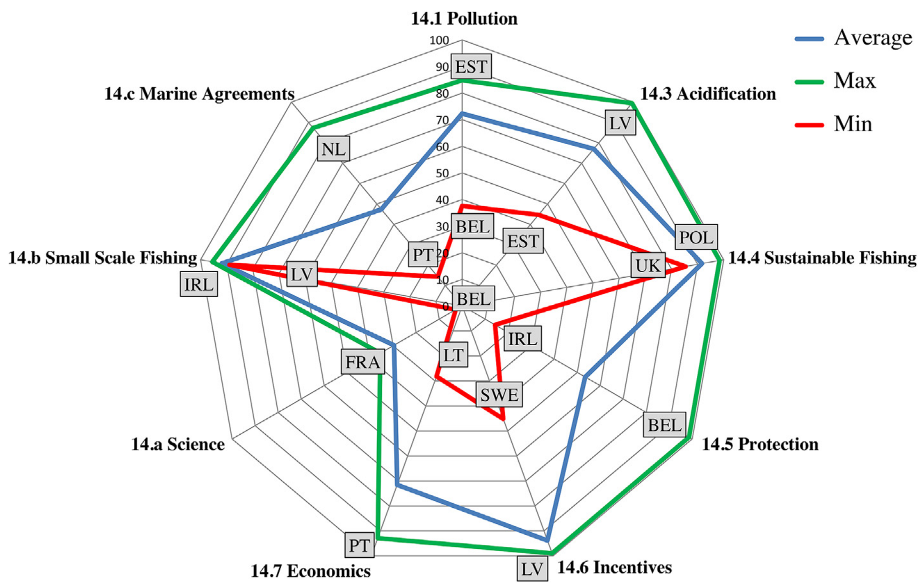


**Fig. 3.** Ocean State of EU Coastal Countries at the Target Level with $\sigma = 0.5$. The figure shows the EEZ-weighted average, the maximum, and minimum scores for targets for the most recent available information under low substitution possibilities.

in Target 14.6 a score of 97 compared to Target 14.c with a score 37). Under a concept of weak sustainability, Portugal can compensate its rather low scores in Target 14.c by its good scores in Target 14.4 and 14.6. However, under a concept of strong sustainability with low substitution elasticities the possibility to compensate for poor scores is limited and accordingly a more balanced performance across goals is required to achieve a good score. The complete information about scores at the SDG level and corresponding ranks for both concepts of sustainability and for both assessment points in time can be found in Table A.I in the Appendix.

Comparing our assessment for 2012 with the assessment in Rickels et al. [11] (which relies mostly on data from 2012) reveals some important changes. For example, Ireland ranks 4th or 7th (in a ranking with 23 countries under a concept of weak and strong sustainability, respectively) in Rickels et al. (2016). Here, Ireland ranks 11th or 12th in 2012 (in ranking with 15 countries under a concept of weak and strong sustainability, respectively). Belgium ranks 3rd and 4th (in a ranking with 23 countries under a concept of weak and strong sustainability, respectively) in [11]. Here, Belgium ranks 14th or 15th in 2012 (in a ranking with 15 countries under a concept of weak and strong sustainability, respectively). These differences can be explained as follows. First, we have selected two indicators from the Global Indicator Framework Database which became available only recently. In particular the indicator *Coverage of protected areas in relation to marine areas* (*#6 MPA/EEZ*) obtained from the official database provides different information for some countries compared to [11] who calculated the indicator themselves, relying on information from Natura 2000 [55]. Second, we have selected other indicators than [11] for targets 14.3 and 14.c, replacing *Natural Product (OHI)* by *#3 CO2 Compliance* in measuring progress against Target 14.3 (Acidification) and replacing *Participation rate in International Marine Agreements* by *#17 IMO Participation* and *#18 MSFD Measures* in measuring progress against Target 14.c. Third, for two indicators, *#16 Fish Species Threatened* and *#9 Fisheries Subsidies* the underlying calculation method and database have changed compared to [11], respectively. Fourth, for other indicators, values for 2012 have been changed retrospectively because new data became

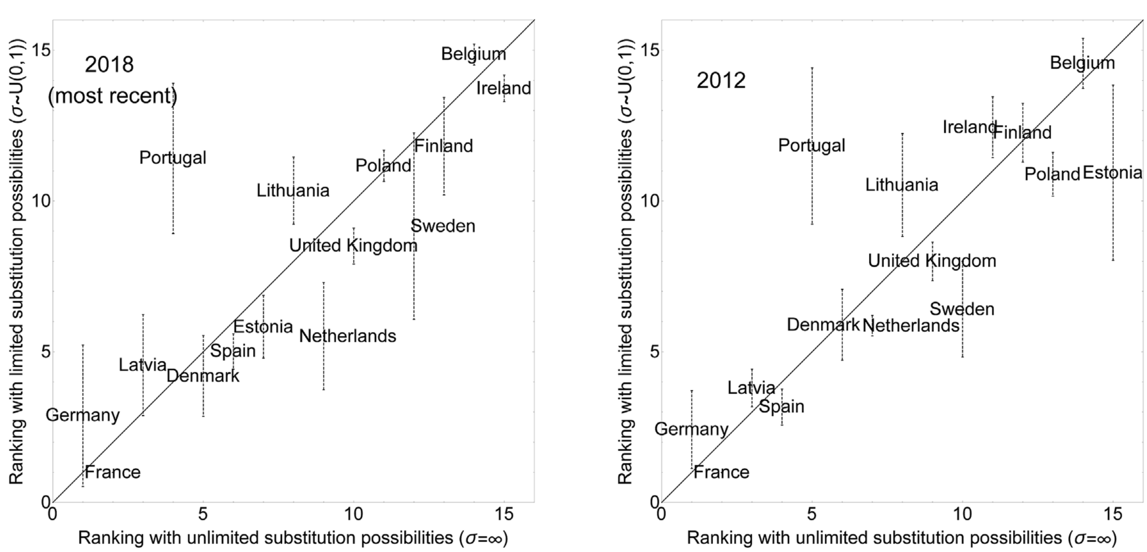


**Fig. 4.** Ocean State Ranking of EU Coastal Countries under the two Concepts of Sustainability. The information is provided for the two assessment dates, 2018 (most recent data) and 2012, in the left and right panel, respectively. Error bars indicate ± 1 standard deviation under the Monte-Carlo Simulation based calculation of average rank under the concept of strong sustainability.

available (e.g. *#1 Gross Nitrogen Balance*) or because changes in the calculation of the indicator have been applied retrospectively (e.g., indicators taken from the OHI). Despite these considerable changes, the ranking information has not flipped compared to [11]. In both assessments, Germany and France rank on the first places (even though they have switched places) and other countries like for example Poland, the Netherlands or Estonia rank rather similar.

Still, until all indicators for SDG14 as defined by the IAEG-SDGs are provided by the Global Indicator Framework Database it appears rather unlikely that an assessment of the current ocean state or corresponding ranking information are accepted by (all) countries. At the same time the difference between the two assessments indicates the difficulties faced in the IAEG-SDG process, namely that any selection or dumping of indicators implicitly involves a weighting decision with important consequences for the assessment which in turn explains the bargaining nature of this process between country representatives. Anyhow, while these considerations clearly limit the validity of our status assessment, they do not apply to the comparison over time where unambiguous assessment of development is possible.

### 3.2. EU ocean development

Fig. 5 shows the best development, the poorest development, and the EEZ-weighted average change at the indicator and target level between 2012 and the most recent available data (upper and lower panel, respectively).

Notably, we observe a decline at the EEZ-weighted level for almost all fishery related indicators (*#5 FSMY/F,* −5 points, *#9 Fisheries Subsidies,* −2 points, and *#14 SAD/TAC,* −5 points, while *#6B/BMSY* remains almost unchanged with +0.5 points and only #10 TAC/*Catch* increases by 2 points). The EEZ-weighted decline in *#5 FMSY/F* is in particular driven by Finland (−15 points, explained by the reduction in FSMY/F for herring in the Gulf of Bothenia and the Gulf of Riga), Denmark and Ireland (both −12 points, explained by the reduction in FMSY/F for blue whiting in the Northeast Atlantic) and by UK and Netherlands (−12 and −10 points, respectively). However, there are also countries with an opposite development. Poland improves by 21 points (explained by the improvement in FMSY/F for sprat in the Baltic Sea) and Belgium, France, Estland improve by 5, 3, and 2 points, respectively. While Denmark experiences the strongest decline in *#5 FMSY/F,* it also experiences the strongest improvement in *#6 B/BSMY* (+6 points), reflecting the different time scale on which these indicators measure development. Prior to 2016 (the most recent assessment date for the fish stocks used in our analysis) fishing mortality for fish stocks fished by Denmark was sustainable, accordingly, the more recent decline in fishing mortality has not yet become present in the development of the fish biomass. The opposite development for #10 TAC/*Catch* and *#14 SAD/TAC* might be explained by increases in TACs across fish stocks, reflecting on the one hand that less attention is given to scientific advice, but on the other hand that landings are more likely to comply with total allowable catch. Improvements at the EEZ-weighted indicator level can be observed for *#15 AFO (OHI)* (+7 points), *#2 Plastic Pollution* (+2 points), and *#4 CO2 per Capita* (+2 points). Yet, the magnitude of improvement is considerably smaller.

Turning to the target level (calculated under high substitution possibilities), we observe modest improvements at the EEZ-weighted average for the Targets 14.1 Marine Pollution (+0.6 points), 14.3 Ocean acidification (1.3 points), 14.5 Protection and Conservation (+0.2 points), 14.6 Incentives (+0.6 points), and 14.b Small Scale Fishing (+3 points), while the EEZ-weighted average scores for 14.4 Sustainable Fishing (−2 points), 14.7 Economics (−0.8 points), and 14.a Science (−2.3 points) decline. Notably is the development of Estonia which achieved the strongest improvements in three targets (14.6, 14.7, and 14.b) while both, Ireland and Finland, experience the strongest decline in two targets (Ireland in 14.3 and 14.a and Finland in 14.4 and 14.6).

However, even though the information in Fig. 5b is less complex (9 target scores versus 18 indicator scores in Fig. 5a), it still remains difficult to assess the overall performance in ocean development. For that reason, we now turn to the assessment at the SDG level which is summarized in Fig. 6. The Figure shows the actual change in scores at the SDG level between the two assessment dates for both concepts of sustainability. Quadrant I and III contains developments where under both concepts of sustainability either sustainable development is achieved or missed, respectively. Quadrant II contains developments where sustainable development is achieved under a concept of strong sustainability but missed under a concept of weak sustainability. Such a development can emerge if overall the country performance becomes more balanced which means it improves its scores in a relatively poor performing target while at the same time the score in a relatively strong performing targets declines. If the latter exceeds the improvement in the former, sustainable development under a concept of weak sustainability is missed because here the sum of scores is relevant and not its distribution across targets. The opposite mechanism is at play for Quadrant IV which contains developments where sustainable development is achieved under a concept of weak sustainability but missed under a concept of strong sustainability. Here, the sum of scores has increased but became less equally distributed across targets than before.

Estonia, Denmark, Lithuania, Portugal, and Poland manage to increase their aggregated targets scores under high and low substitution possibilities, achieving in our framework sustainable ocean development under both concepts of sustainability. Notably is the development of Estonia which improves by 2.4 and 3.5 points under high and low substitution possibilities, respectively. Estonia improves in all indicators but three, *#14 SAD/TAC* (−6.4 points), *#8 Biodiversity (OHI)* (−2.3 points), and *#12 Tourism (OHI)* (−1.6 points). However, it scored rather high in these indicator before so that it compensate for this reduction overall by improving in particular in *#9 Fisheries Subsidies* (+18.4 points), *#2 Plastic Pollution* (+13.2 points), and *#11 Economics (OHI)* (+12.4 points). However, Estonia ranked 11$^{th}$ and 15$^{th}$ in 2012 (under a concept of strong and weak sustainability, respectively), indicating that Estonia had considerable room for improvement (and still has given its poor performance in the indicator *# 4 CO2 per capita,* see Fig. 2).

Finland and the Netherlands are situated in Quadrant II. While the sum of target scores declines for both countries, the scores become more equally distributed across targets, implying that they achieve sustainable development under a concept of strong sustainability (low substitution possibilities) but fail to achieve sustainable development under a concept of weak sustainability (high substitution possibilities). This overall development of Finland appears to be surprising at the first view because Finland experiences for two targets (14.4 and 14.6) the strongest decline among all countries between the two assessments dates (see Fig. 5). However, in both targets, Finland scores extremely well in 2012 (in both a score of 99), implying that the strong decline affects targets which were less scarce in Finland. On the other hand, Finland manages to improve in less well performing goals (14.1 + 8.5 points, 14.3 + 3 points, and 14.7 + 2 points). These improvements cannot compensate in aggregated terms for the decline in the targets 14.4 (−8 points), 14.5 (−3.2 points), and 14.6 (−12.8 points), however, under a concept of strong sustainability the improvement takes place in more scarce targets, implying that the score improves under low substitution possibilities.

The opposite holds true for those countries situated in Quadrant IV: Latvia and Spain. While their sum of scores increases, the increase takes place in targets which are less scarce (under a concept of strong sustainability) while already poorly performing targets even decrease further. Consequently, they achieve sustainable development only under a concept of weak sustainability, not under a concept of strong sustainability.

The remaining countries, Ireland, Belgium, Sweden, Germany,

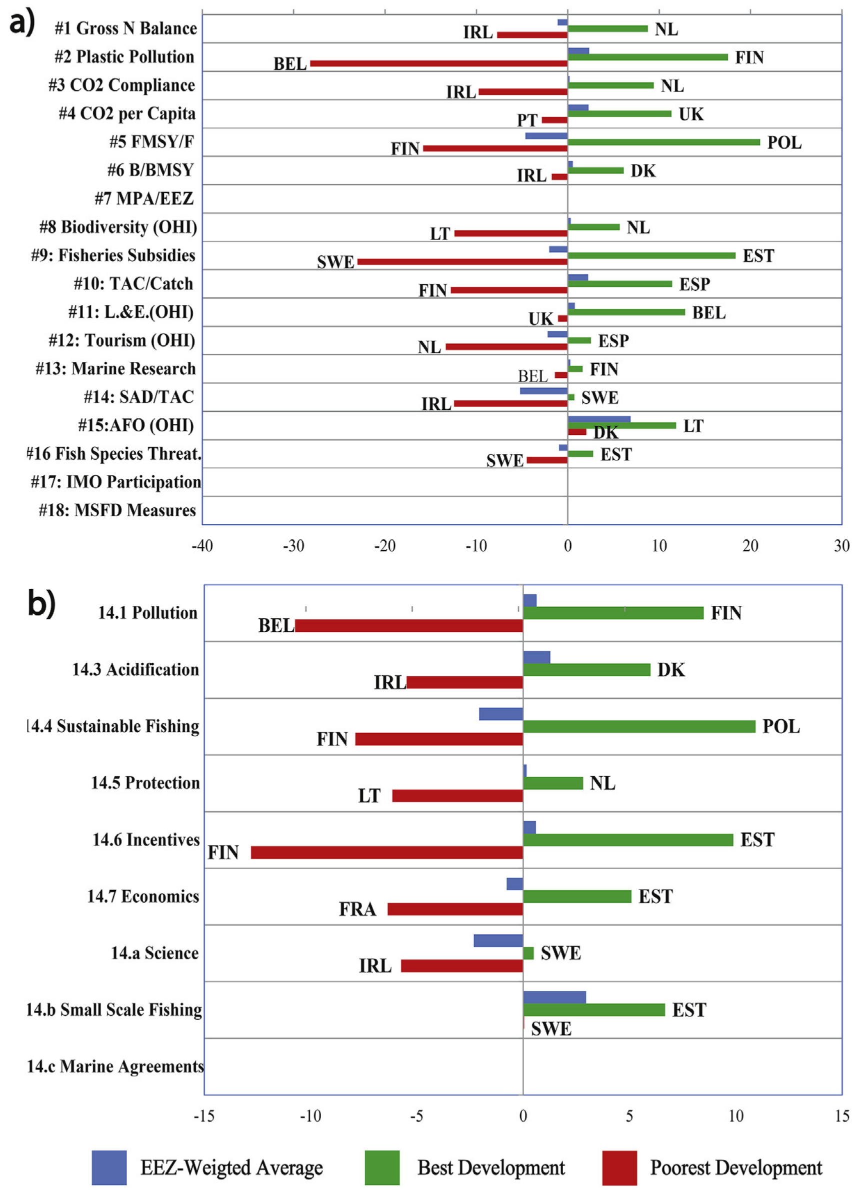


**Fig. 5.** Ocean Development of EU Coastal Countries at the Indicator and Target Level. The figure shows the EEZ-weighted average change, the best development, and the poorest development across indicators (a) and targets (b) between 2012 and the most recent available information.

France, and the United Kingdom are situated in Quadrant III which unambiguously indicates that these countries have not achieved sustainable ocean development. However, the United Kingdom is almost located at the origin, experiencing a decline in the aggregated score by $-0.01$ under high and low substitution possibilities, implying that their situation (in aggregated terms) is almost unchanged. France and Germany experience modest reductions in scores ($-0.8$ and $-1.1$ points under a low substitution possibilities and $-0.3$ and $-0.3$ points under a high substitution possibilities, respectively). France and Germany have top ranks among the countries (France and Germany rank 1st and 2nd under low substitution possibilities at both assessment dates, respectively, and rank 2nd and 1st under high substitution possibilities at both assessment dates, respectively). Consequently, one might argue that for these countries it becomes increasingly harder to improve. However, looking not at the changes in scores or the ranking information, indicates that for both countries there is still sufficient room for improvement (France and Germany achieve an overall score of 75.0 (79.8) and 73.0 (80.2) under low (high) substitution possibilities at the most recent assessment date, respectively). Notably is the strong decline in scores for Ireland and Belgium. Like Finland, Ireland experiences for two targets the strongest decline among all countries. However, in contrast to Finland, the decline does not take place in targets where Ireland scored well before and it also misses to improve in formerly poor scoring targets. Similar reasoning applies to Belgium. While Belgium experiences a smaller decline in the sum of the targets scores, it experiences the strongest decline under a concept of strong sustainability. This is mainly explained because Belgium has the strongest decline in its second worst performing target (14.1), making Belgium's overall performance even more unbalanced. Looking at the changes in scores for the EEZ-weighted aggregated EU-target levels, we observe that overall there is a small increase under a concept of weak sustainability ($+0.05$ points), but a decrease under a concept of strong sustainability ($-0.52$ points). Detailed information about changes in scores for both concepts of sustainability can be found in Table A.I in the Appendix.

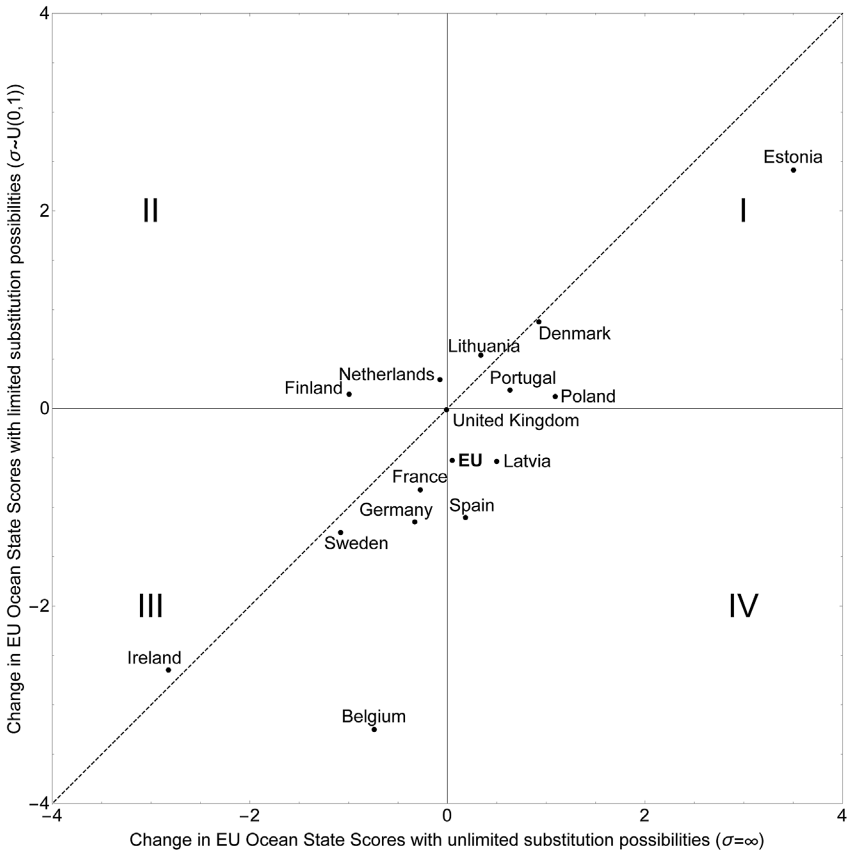


**Fig. 6.** Ocean Development of EU Coastal Countries at the SDG Level under two Concepts of Sustainability. The figure displays absolute change in scores at the SDG level between the two assessment dates, 2018 (most recent data) and 2012, for a concept of weak sustainability and strong sustainability on the x and y axis, respectively.

## 4. Conclusion

The European Commission (EC) established its Blue Growth strategy to coordinate the development in maritime and marine sectors, focusing on renewable energies, biotechnology, (deep-sea) mineral resources, aquaculture, and tourism [1]. At the same time, the strategy acknowledges the importance of sustaining the marine resource base to actually achieve long-term blue growth and in turn requires harmonization with the Marine Strategy Framework Directive. Here, we extended the analysis of Rickels et al. [11] to provide an assessment of sustainable ocean development for EU coastal countries as defined by SDG 14 (Ocean and Coast) over time to assess whether the EU coastal countries have achieved comprehensive blue growth. We selected a set of 18 indicators to measure progress against SDG 14. For two of these 18 indicators the data is already provided by the official Global SDG Indicators Database. We have restricted the assessment to EU coastal states in the Baltic and North Sea and the Atlantic Ocean because only for these states information related to fisheries is provided by ICES. The indicator set allows assessment of sustainable ocean development at the indicator, target, and SDG level. The aggregation at the target and SDG level was achieved by nested composite indicators with different substitution possibilities at different levels. At the SDG level we distinguished between a concept of weak and strong sustainability, assuming high and low substitution possibilities, respectively. We compared two points in time: the most recent status against the status in 2012. By focusing on the change at the indicator, target, and SDG level over time, various problems related to standardization and selection are mitigated as the focus on change between two different points in time allows for a more robust assessment of sustainable development than an assessment of the state at given point in time.

Our results indicate a mixed ocean development for those EU coastal states in our assessment. There are countries which manage to achieve sustainable development under both concepts of sustainability (most notably Estonia with the strongest improvement), but there are also countries which fail to achieve sustainable development under both concepts (most notably Ireland and Belgium with the strongest decline). There are countries which manage to improve their scores in relatively poor performing goals, but failed to increase the sum of target scores (achieving sustainable development only under a concept of strong sustainability) and countries for which the opposite holds true. Looking at the EEZ-weighted aggregated target scores, a sustainable ocean development under a concept of strong sustainability is missed. The strongest decline at the EEZ-weighted target level is observed for the target related to sustainable fishing (driven in particular by higher fishing mortality relative to the reference value necessary for maintaining maximum sustainable yield) and for the target related to ocean science (driven in particular by the decline of setting total allowable catch in accordance with scientific advice). Consequently, based on these findings one could put into question that the EU has achieved comprehensive blue growth (between 2012 and the most recent data in our assessment) which would have also required to maintain the marine resource base. Clearly, our selection and calculation of indicators can be considered to be inappropriate for measuring progress against Sustainable Development 14 or blue growth. Furthermore, our SDG14 target-based assessment would need to be put into relation to national or capital approach based assessments to obtain a sense about the scale of the achieved (or missed) sustainable developments. Still, we believe that our approach, supplementing the assessment of individual indicators with an assessment based on a nested composite index, aggregating the various dimensions of sustainable ocean development under different levels of substitution possibilities, provides a value tool for monitoring and understanding ocean development.


## Acknowledgements

We would like to thank the editor of Marine Policy and two anonymous referees for various helpful comments and suggestions. This work was supported by the German Research Foundation via the Cluster of Excellence “The Future Ocean [24122362/EX80_CPi1697] and the BONUS BLUEWEBS project [BMBF FKZ 03F0772B] which has received funding from BONUS (Art 185), funded jointly by the EU, the Academy of Finland, Projektträger Jülich (PtJ), Germany, the State Education Development Agency of Latvia, the National Centre for Research and Development, Poland, and the Swedish Research Council Formas.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.marpol.2019.103515.

## Appendix

Table A.1
Scores and Ranks for EU Coastal States and the EEZ-weighted aggregated target scores in the Baltic and North Sea and the Atlantic Ocean for 2012 and the most recently available data (2018 assessment).

| | Concept of Strong Sustainability ( $\sigma \sim U(0,1)$, $N = 10000$) | | | | | | | | | Concept of Weak Sustainability ($\sigma \to \infty$) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2018 | | 2012 | | Change | 2018 | | 2012 | | 2018 | 2012 | Change | 2018 | 2012 |
| | Score | SD | Score | SD | | Rank | SD | Rank | SD | Score | Score | | Rank | Rank |
| France | 74.96 | 5.25 | 75.78 | 4.98 | −0.82 | 1 | 0 | 1 | 0 | 79.79 | 80.06 | −0.27 | 2 | 2 |
| Germany | 73.02 | 7.61 | 74.15 | 6.78 | −1.13 | 2.87 | 2.34 | 2.41 | 1.29 | 80.18 | 80.51 | −0.33 | 1 | 1 |
| Denmark | 70.27 | 6.14 | 69.39 | 5.76 | 0.88 | 4.19 | 1.34 | 5.87 | 1.17 | 76.38 | 75.45 | 0.93 | 5 | 6 |
| Latvia | 70.23 | 6.18 | 70.75 | 5.23 | −0.52 | 4.52 | 1.67 | 3.79 | 0.62 | 77.50 | 77.00 | 0.50 | 3 | 3 |
| Spain | 70.13 | 5.99 | 71.22 | 4.90 | −1.09 | 5.01 | 0.59 | 3.17 | 0.60 | 76.29 | 76.10 | 0.18 | 6 | 4 |
| Netherlands | 69.99 | 4.84 | 69.70 | 4.92 | 0.29 | 5.56 | 1.76 | 5.87 | 0.34 | 75.03 | 75.10 | −0.08 | 9 | 7 |
| Estonia | 69.78 | 5.25 | 67.36 | 4.08 | 2.43 | 5.84 | 1.03 | 10.99 | 2.91 | 75.40 | 71.90 | 3.50 | 7 | 15 |
| UK | 68.43 | 5.93 | 68.44 | 5.71 | −0.01 | 8.49 | 0.59 | 7.99 | 0.64 | 74.81 | 74.82 | −0.01 | 10 | 9 |
| Sweden | 68.24 | 4.07 | 69.50 | 4.51 | −1.26 | 9.21 | 3.09 | 6.44 | 1.57 | 73.00 | 74.08 | −1.08 | 12 | 10 |
| Lithuania | 67.30 | 6.64 | 66.76 | 7.32 | 0.53 | 10.30 | 1.11 | 10.49 | 1.70 | 75.36 | 75.03 | 0.34 | 8 | 8 |
| Poland | 66.98 | 5.73 | 66.85 | 5.43 | 0.13 | 11.18 | 0.53 | 10.90 | 0.72 | 74.03 | 72.94 | 1.09 | 11 | 13 |
| Finland | 66.61 | 5.06 | 66.47 | 5.45 | 0.13 | 11.86 | 1.61 | 12.29 | 0.97 | 72.37 | 73.36 | −1.00 | 13 | 12 |
| Portugal | 64.85 | 10.15 | 64.66 | 10.00 | 0.19 | 11.36 | 2.48 | 11.76 | 2.58 | 76.65 | 76.01 | 0.63 | 4 | 5 |
| Ireland | 63.40 | 5.53 | 66.05 | 6.17 | −2.65 | 13.75 | 0.43 | 12.45 | 1.02 | 71.02 | 73.84 | −2.82 | 15 | 11 |
| Belgium | 60.77 | 7.56 | 63.99 | 5.51 | −3.22 | 14.86 | 0.35 | 14.58 | 0.83 | 71.54 | 72.28 | −0.74 | 14 | 14 |
| W_EEZ | 70.55 | 5.14 | 71.07 | 4.55 | −0.52 | – | – | – | – | 75.83 | 75.78 | 0.05 | – | – |

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