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Draft Matrix of Regional Seas Indicators

A Matrix of Indicators used in the regional seas activities and other global initiatives

UNEP analysed the sets of assessment indicators that are currently used independently by different regional entities and globally. A draft set of "Coordinated Indicators" across Regional Seas Programmes was proposed in the report "*Measuring Success: Indicators for the Regional Seas Conventions and Action Plans*[1]". The indicators consist of ecosystem based indicators as well as socio-economic indicators as shown in Table 1. The proposed indicators are compared with the agreed SDG 14 targets and the actually used TWAP indicators.

Table 1. Proposed coordinated set of indicators in comparison with SDG14 and TWAP

Category of Indicator	**Possible regional Seas Coordinated Indicator**	**SDG 14 (plus SDG 1 SDG 2 others)**	**TWAP indicators**[2]	**Future WOA indicators?**[3]
Total inputs of nitrogen and phosphorus from	Chlorophyll a concentration as an indicator of phytoplankton biomass	14.1	Chlorophyll time series; DIN, DIP (modelled data)	
Inputs of marine chemical pollution Trends for selected priority chemicals (e.g.	Trends for selected priority chemicals (e.g. PCBs)	14.1	POPS (Persistent Organic Pollutants) status	
Overall levels of marine litter Quantification of beach litter items	Quantification of beach litter items	14.1	Marine Plastic Litter	
Ocean warming	Annual mean sea surface temperature Carbon dioxide flux (partial pressure of CO2)	14.2	Sea Surface Temperature (SST)	
Losses due to extreme events Insurance claims from climate change-related	Insurance claims from climate change-related events	14.2	NA	
Fish landings	Fish catches within EEZs (tonnes) – total capture production	14.4	Fish landings and Landed Value, Fishing effort, Fish stock status, Primary Production required, Marine Trophic Index, Fishing in Balance Index	

[1] http://apps.unep.org/publications/index.php?option=com_pub&task=download&file=-Measuring_success__indicators.pdf

[2] A detailed table is presented below.

[3] No indicator has been set in the World Ocean Assessment. An analysis should be made on possible future indicators for WOA based on the anecdotal information contained in the first WOA report.

Aquaculture	Application of risk assessment to account for pollution and biodiversity impacts	14.4		
Population pressure / urbanization	% built up coastline	14.2	Rural/ Urban population, %poor,	
Eutrophication status	% problem areas (including occurrence of nuisance phytoplankton and algal toxins)	14.1	Index of coastal eutrophication	
Pollution hot spots	Status of selected pollutant contamination in biota and sediments and temporal trends	14.1	Floating plastic debris	
Ocean acidification	Aragonite saturation	14.3	Pteropods at risk:	
Level of exploitation of commercial fisheries	FAO stock status: % stocks overfished compared to MSY	14.4	Catch Stock Status, Marine Trophic Index, Fishing in Balance Index	
Species replacement as a consequence of capture fisheries	Marine trophic index	14.5	Marine Trophic Index	
Endangered species	Distribution of Red List Index species	14.5		
Loss of critical habitat	Trends in critical habitat extent and condition	14.5	Mangrove status; Reefs at Risk Index	
National Action Plans to reduce input from LBS	% National action plans ratified / operational	14.1	Transboundary Legal Instruments	
Waste water treatment facilities	% coastal urban population connected	14.1	NA	
Incentive to reduce marine litter at source	% port waste reception facilities available	14.1	NA	
Climate change adaptation	% national adaptation plans in place	14.2	Transboundary Legal Instruments	
Fish harvested within safe ecological limits	Fisheries measures in place (by-catch limits, area-based closures, recovery plans, capacity reduction measures) and multilateral/bilateral fisheries management arrangements	14.4	Catch Stock Status, Marine Trophic Index, Fishing in Balance Index; Fishery Production Potential of LMEs	

Critical marine habitat under protection	% Marine protected areas designated	14.5	Change in Protected Area Coverage	
ICZM in place	ICZM guidelines and enabling legislation adopted for the region	14.2		

Table 2: Indicators used in assessing Large Marine Ecosystems (LMEs) in TWAP. These indicators were evaluated as to their suitability for the multivariate analyses (i.e., directionality, availability, low correlations, high variance), which resulted in the final 11 selected (top row).

Productivity	**Fisheries**	**Pollution & Ecosystem health**	**Socioeconomics**	**Governance**
Used in Multivariate Analysis				
None	• Proportion of collapsed and over-exploited stocks (**COE**) • Catch from bottom impacting gear (**CatBot**) • Demersal nondestructive low bycatch (**Dem Ndes LB**)[4] • Pelagic low bycatch (**PLB**)[1] • Capacity enhancing subsidies as a fraction of the value of fisheries (**SUB**)	• Coastal Eutrophication Potential (**CEut**) • Plastic debris density (**Plast**) • Change in MPA coverage (**MPA Area**) • Shipping (**Ship**)[1]	• Rural population within the 100 km coastal zone (**Rur Pop**) • Night-Light Development Index (**NLDI**)	None* * But, Governance architecture indicators used in Scoring medium to very high risk transboundary LMEs

[4] Indicators unpacked from the Cumulative Human Impacts Index

Used in thematic analysis (including indicators listed above)				
• Chlorophyll a • Primary productivity • Sea surface temperature (Impacts) • UV[1]	• Annual catch • Marine trophic index • Fishing in balance index • Fishing effort • Ecological Footprint • Demersal destructive fishing[1] • Demersal nondestructive high bycatch fishing[1] • Pelagic high bycatch fishing[1]	• Nutrients (N, P, Si) • Land-based inorganic[1] • POPs in plastic pellets • Reefs at Risk Index • Mangrove extent • Coral reef extent • Delta vulnerability index • Invasives[1] • Light pollution[1] • Ocean acidification[1] • Oil rigs[1] • Land-based nutrients[1] • Land-based organic[1]	• Coastal population within the 100 km coastal zone • Coastal poor • Fisheries revenues • Fish protein dependence • Tourism revenues • Contribution of LME tourism to national GDP of coastal nations • Human Development Index and Associated Metrics • Vulnerable population to climate-related coastal disasters • Sea level rise threat in 2100 • Present day vulnerability to climate and LME degraded states	Governance architecture • Completeness • Engagement • Integration