An Index to assess the health and benefits of the global ocean

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NCEAS/UCSB

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OCEAN HEALTH INDEX

Our coast and oceans are changing in unprecedented ways

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Policies strive for healthy oceans, without a measurement tool

WEST COAST GOVERNORS' AGREEMENT on OCEAN HEALTH
CALIFORNIA OREGON WASHINGTON

PugetSoundPartnership
our sound, our community, our chance

WORLD OCEAN COUNCIL
The International Business Alliance for Corporate Ocean Responsibility

Media for a Healthy Ocean
www.seastewards.org

OCEANA

What is ‘healthy’?
DOES HEALTHY MEAN PRISTINE?
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People are a part of marine ecosystems
Everywhere.
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FILHOS DO DESTINO
MARIA DA AJUDA
SETUBAL
SETUBAL
SETUBAL
SETUBAL

A healthy ocean delivers a range of benefits to people now and in the future.
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Key attributes of the Ocean Health Index

- Coupled social-ecological systems, focused on benefits/services to people
- Clearly defined reference points
- Current state + likely future condition

10 Public Goals and Sub-goals

Food Provision

- Fisheries
- Mariculture

Tourism and Recreation

Artisanal Fishing Opportunities

Livelihoods & Economies

- Livelihoods
- Economies

Natural Products

Sense of Place

- Iconic Spp
- Places

Carbon Storage

Clean Waters

Coastal Protection

Biodiversity

- Species
- Habitats

Establishing reference points

1. Decide what to measure
2. Decide what to compare it to

Samhouri et al. 2012 Ecosphere

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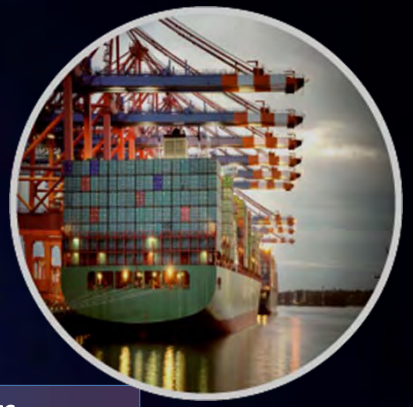
Decide what to measure

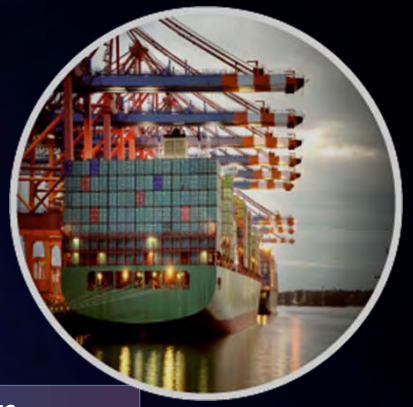


Marine Livelihoods

Worse — Better

Number of marine jobs

Decide what to measure



Marine Livelihoods

Worse — Better

Number of marine jobs

Marine wages

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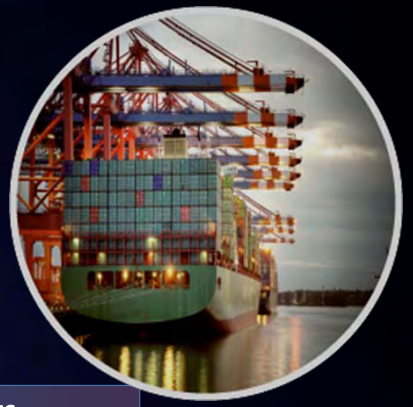
Decide what to measure



Marine Livelihoods

Worse — Better

Number of marine jobs

Marine wages

Marine livelihoods
(jobs and wages)

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Establishing reference points

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Samhouri et al. 2012 Ecosphere

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Types of reference points

1. Functional relationships
2. Spatial comparisons
3. Temporal comparisons
4. Established benchmark

Samhouri et al. 2012 Ecosphere

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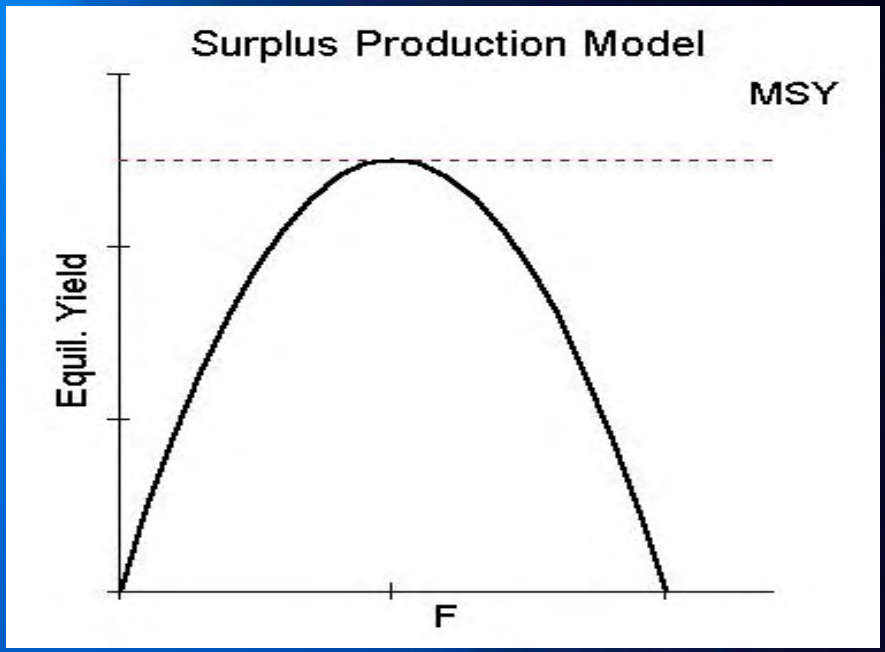
Food Provision:
Wildcaught Fisheries

Maximum Sustainable Yield



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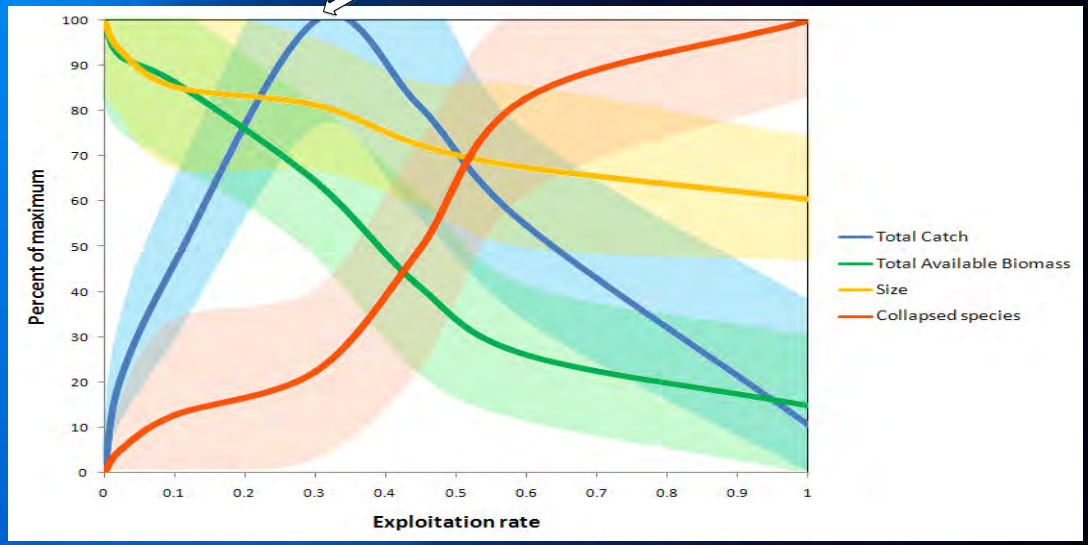
Multi-species MSY



Food Provision:
Wildcaught Fisheries

OCEAN HEALTH INDEX

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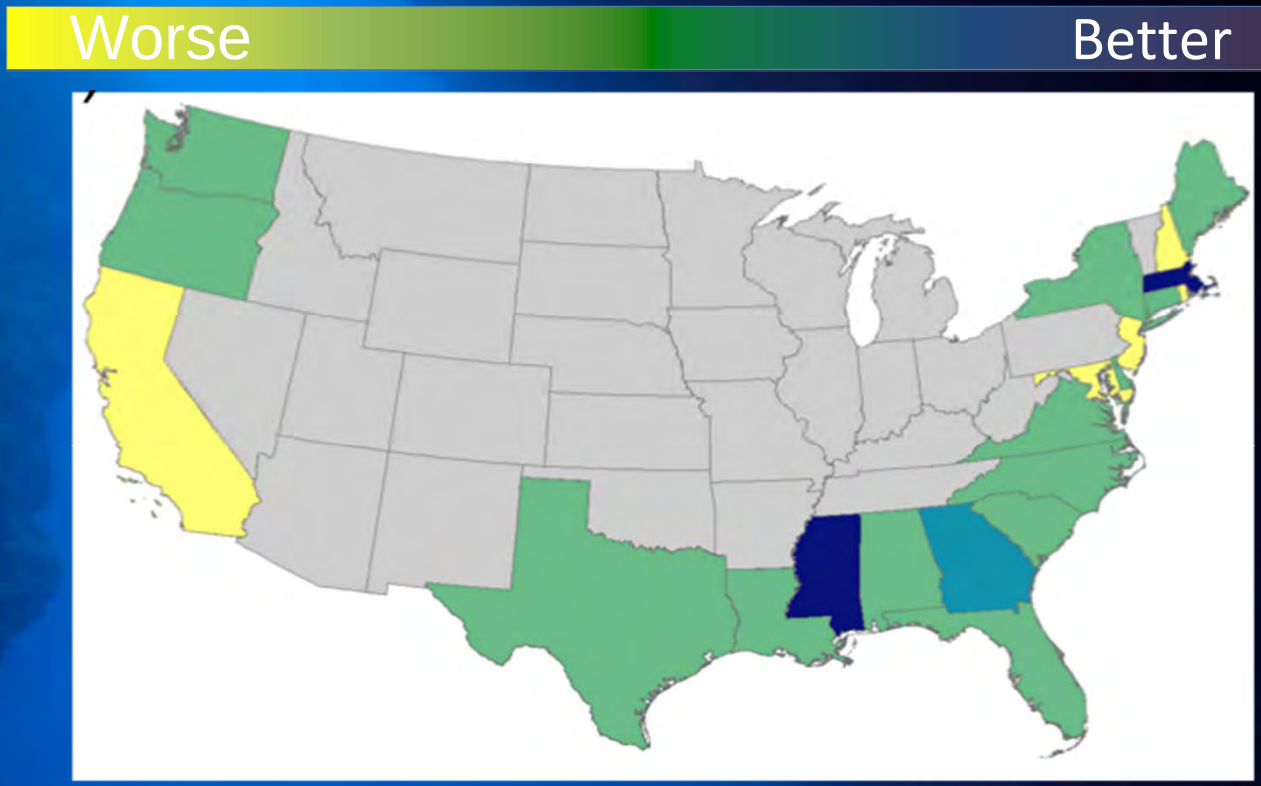
Livelihoods: wages



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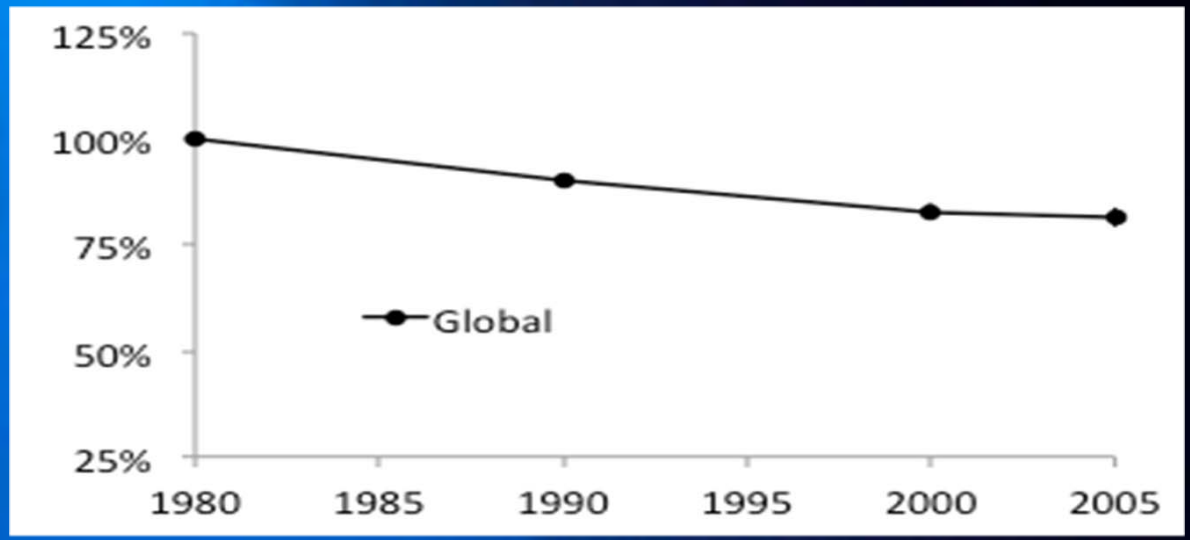
Change in mangrove area extent



Carbon Storage

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Types of reference points

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Biodiversity:
Species

IUCN

- [x] Least concern
- [ ] Near threatened
- [ ] Vulnerable
- [ ] Endangered
- [ ] Critically endangered
- [ ] Extinct

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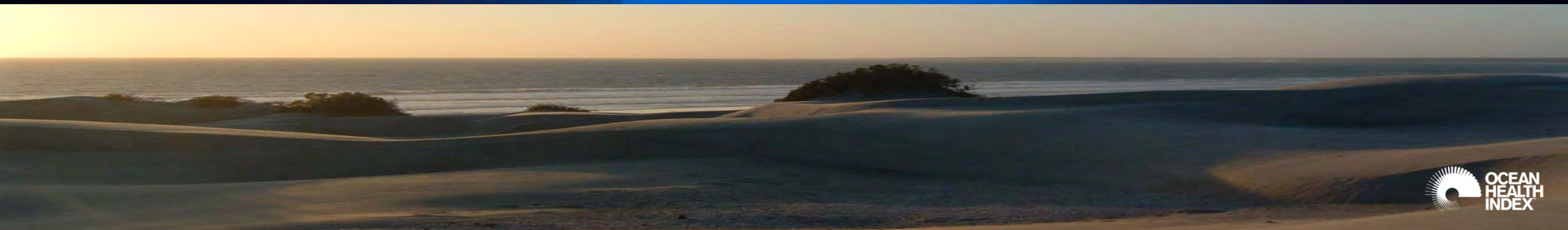
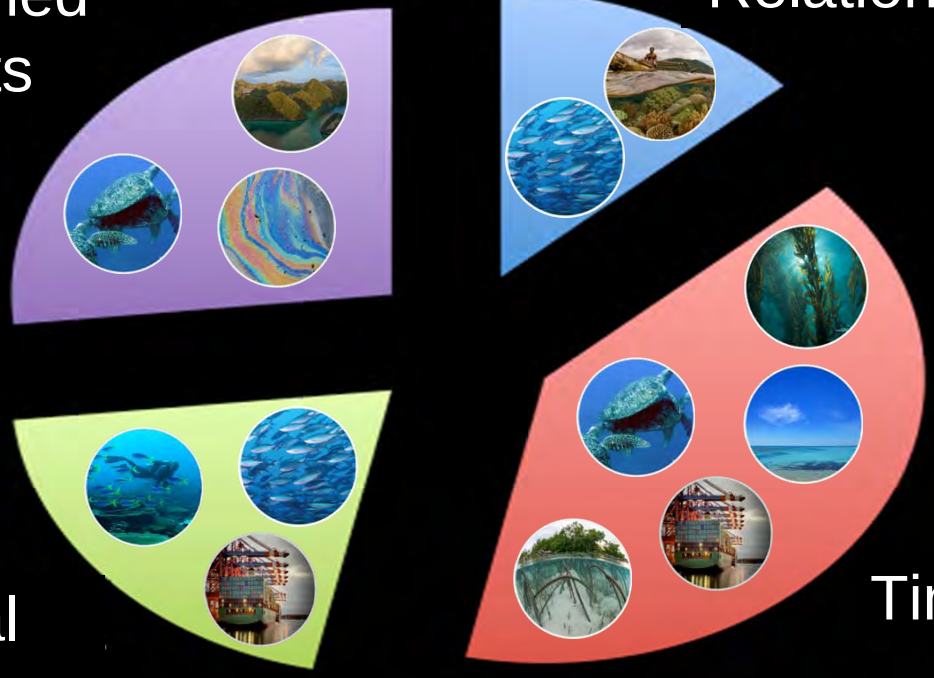
Selecting the right type of reference point

1. The gold standard: functional relationship
2. Otherwise, be SMART
   - Specific
   - Measurable
   - Ambitious
   - Realistic
   - Time-bound



Reference Points for the Global Analysis



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Sustainability: current status + likely future

Food Provision

WILD CAUGHT FISHERIES

•Reported landings (FAO, Sea Around Us Project)

STATUS
(25% Multispecies MSY– total landed biomass)

MARICULTURE

•Mariculture yields (FAO)
•Sustainability of culture (Trujillo MSI (2008)

STATUS

$$\frac{\text{(Yield * Sustainability Score)}}{\text{Area}}$$

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Food Provision

Examples of Pressures and Resilience indicators

Pressures

- Chemical pollution
- Nutrient pollution
- Habitat destruction
- Alien species
- Genetic escapes
- Commercial fishing (high and low bycatch)
- Artisanal fishing
- Social pressures

Resilience

- CBD habitat signatories
- Percent of EEZ in MPAs
- Fisheries management effectiveness
- Ecological integrity
- Quality of governance (World Governance Indicators)

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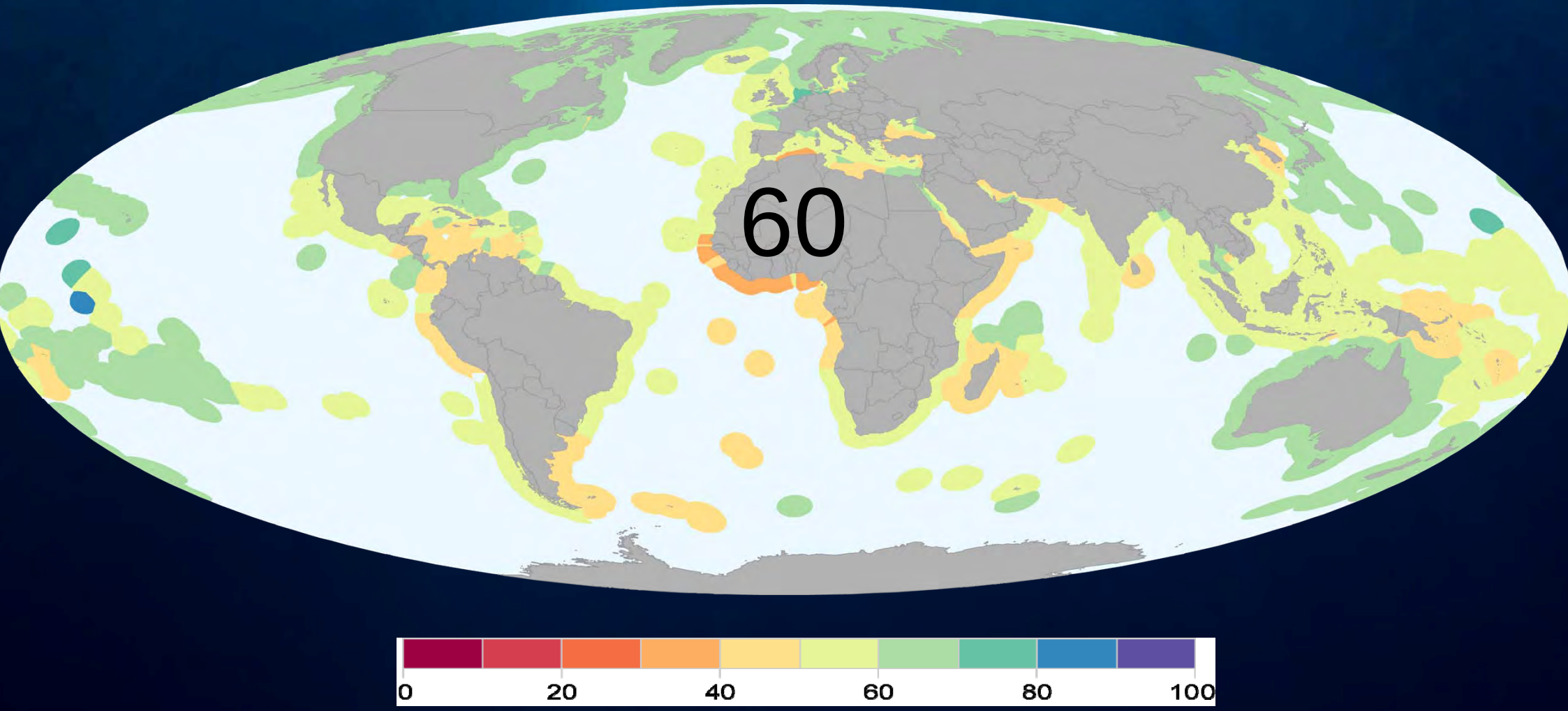
Global Ocean Health Index



Key Messages

1. Portfolio perspective of Index highlights there are many ways to arrive at the same score
2. Sustainability is incorporated in, and fundamental to, many parts of the Index
3. Benefits for humans are central to the Index

Portfolio: many ways to get a score

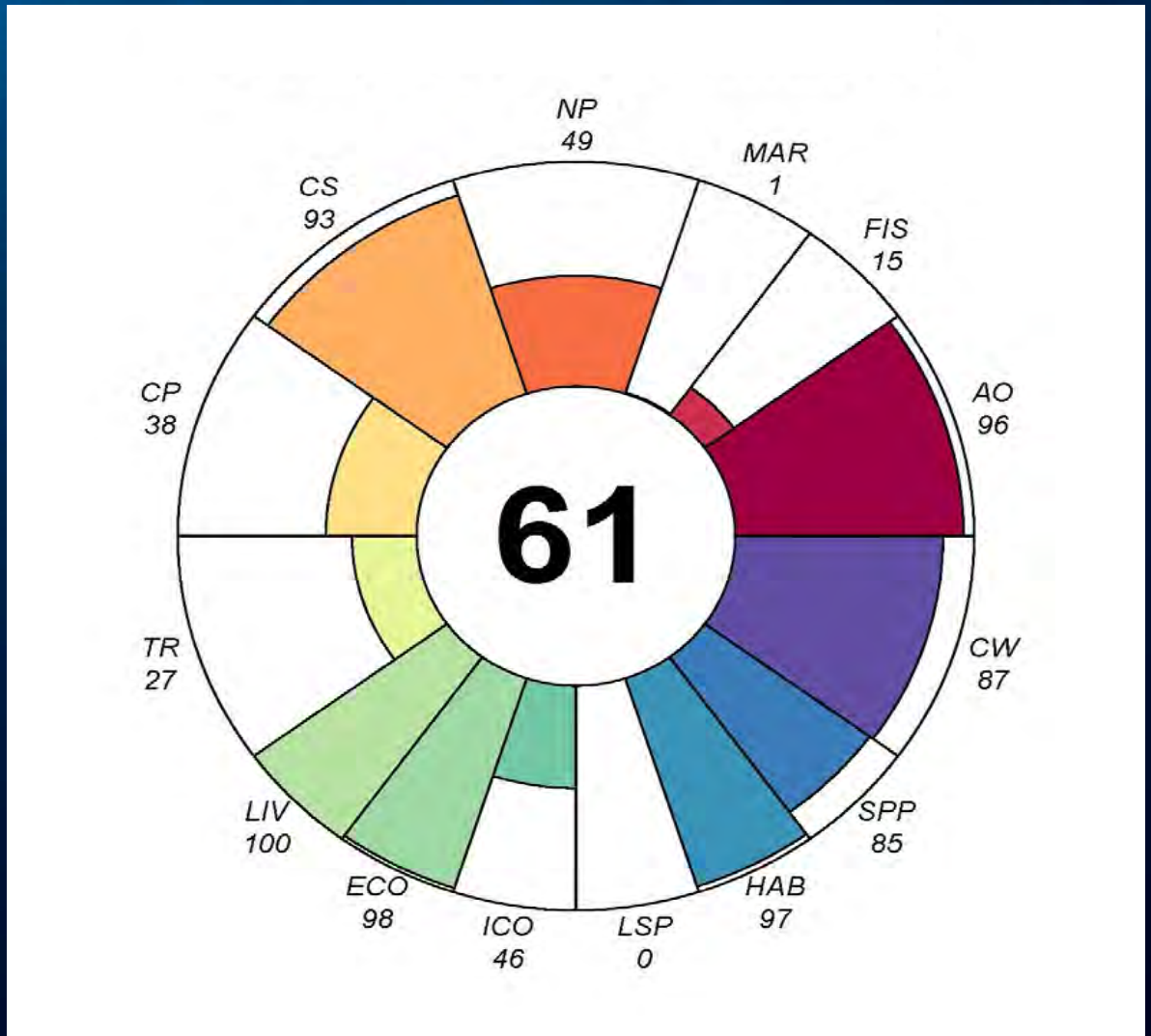
AO = Artisanal Opportunity
FP
- FIS = Fisheries
- MAR = Mariculture

NP = Natural Products
CS = Carbon Storage
CP = Coastal Protection
TR = Tourism & Recreation
LE
- LIV = Livelihoods
- ECO = Economies

SP
- ICO = Iconic Species
- LSP = Lasting Special Places

BD
- HAB = Habitats
- SPP = Species

CW = Clean Waters



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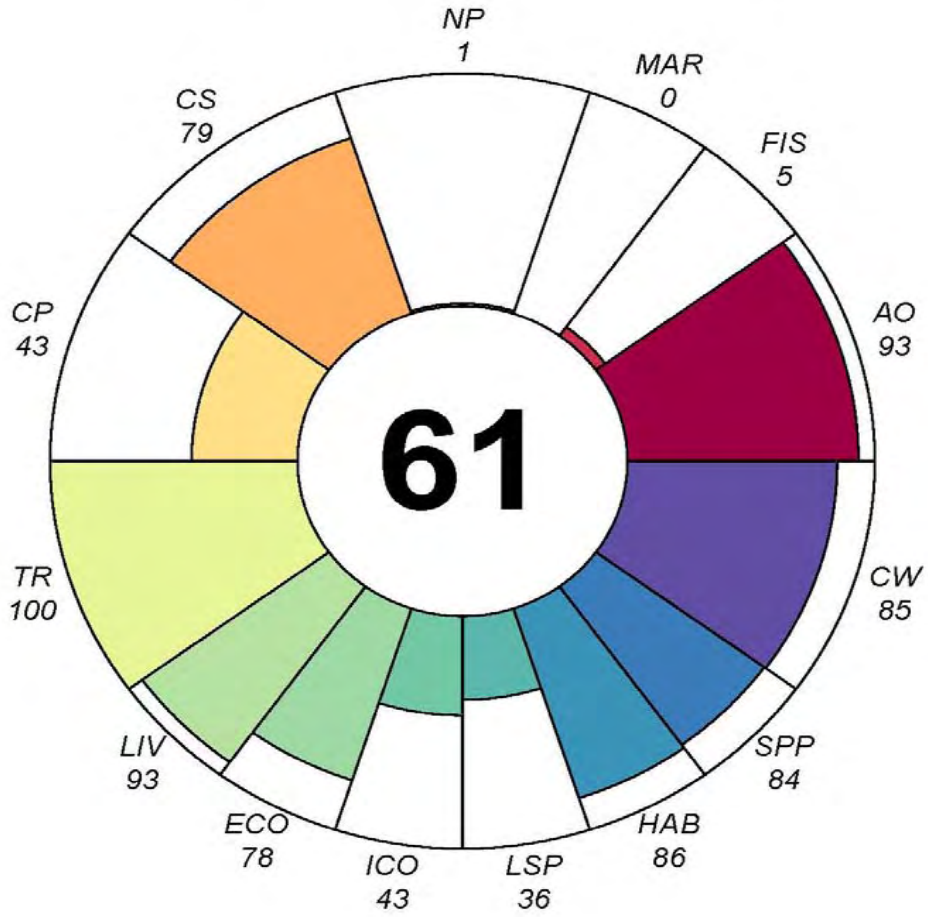

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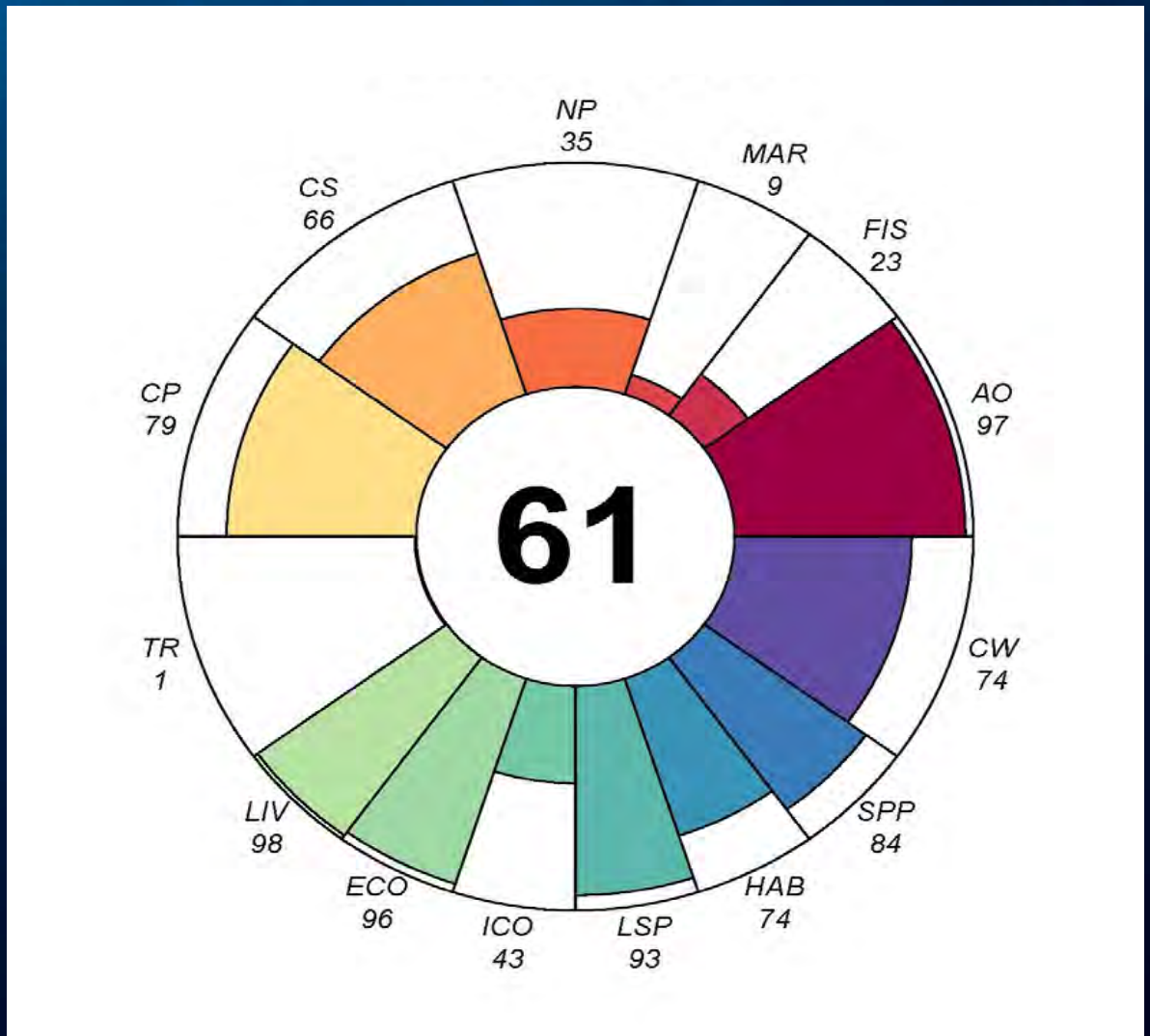
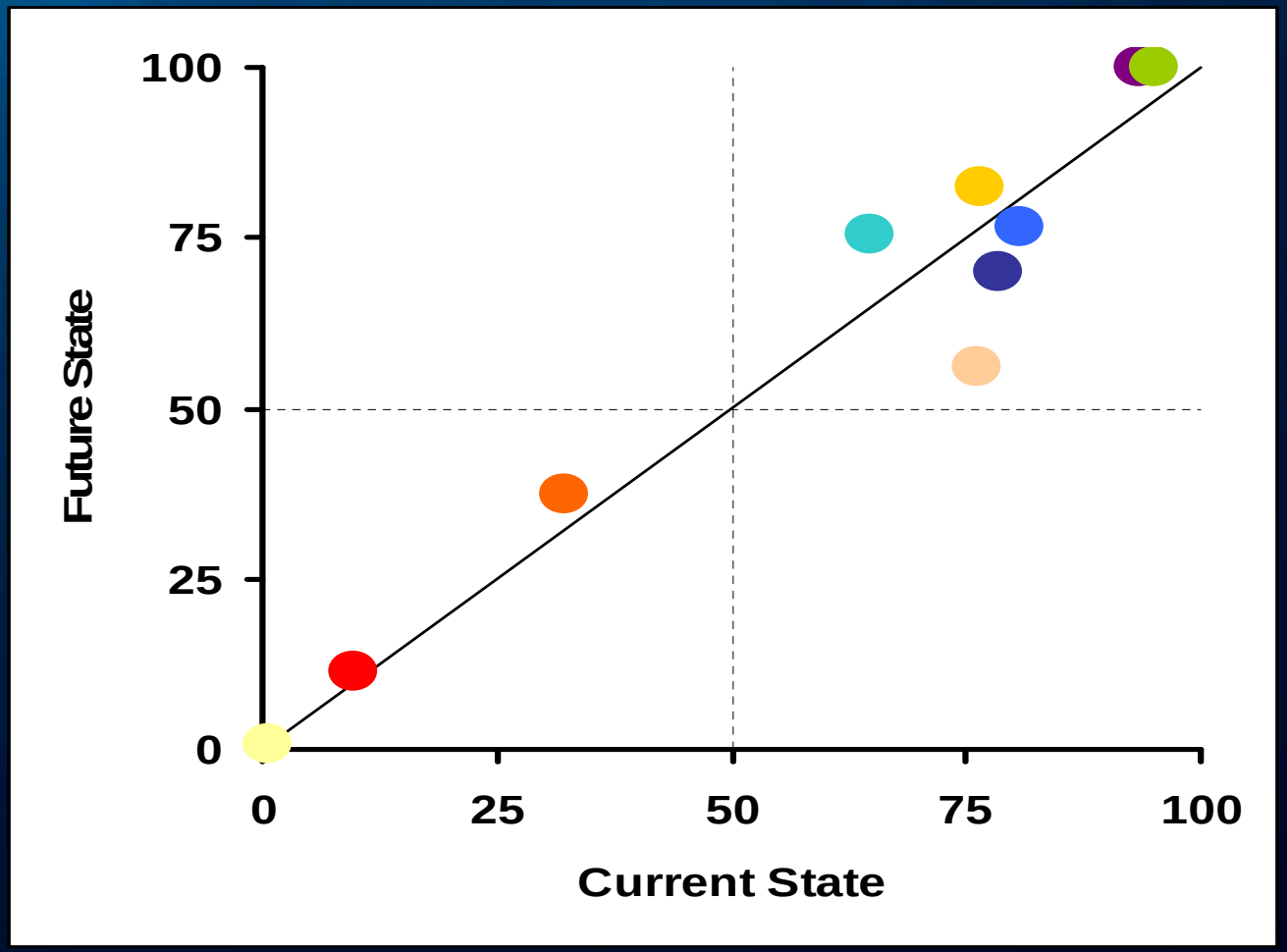
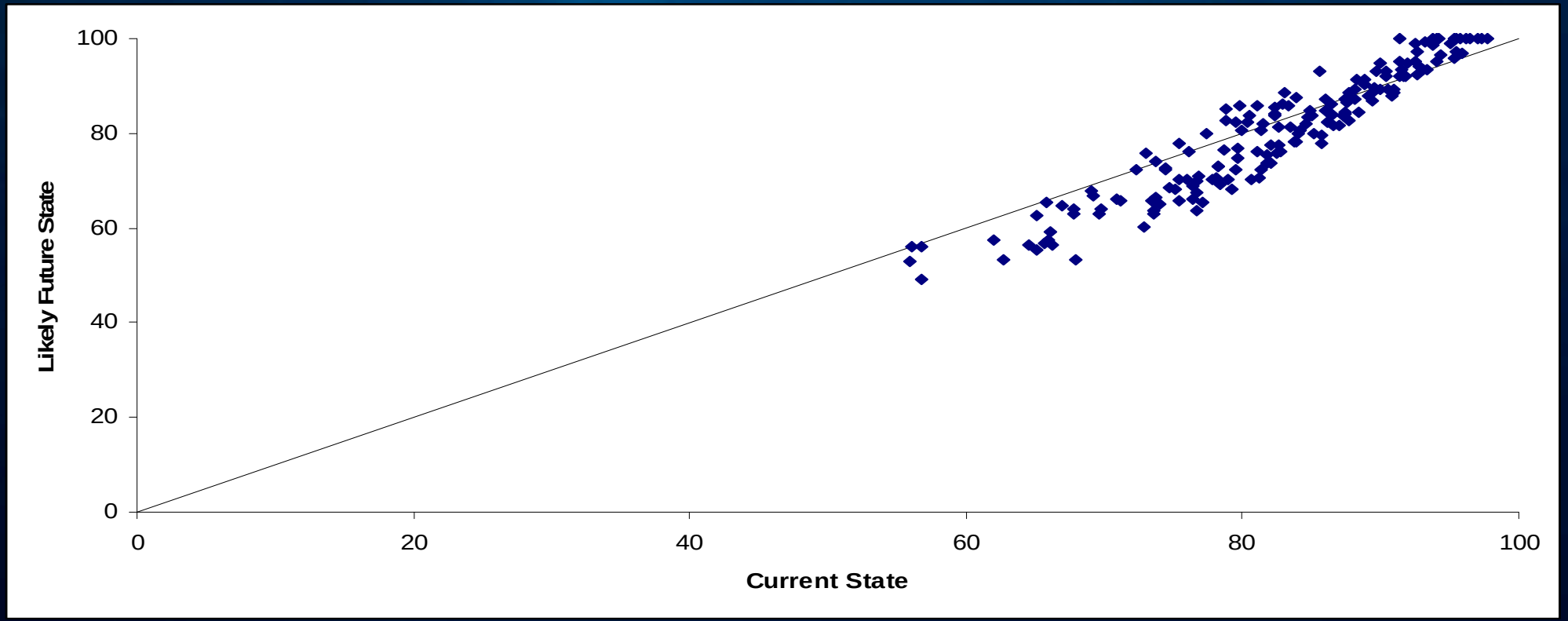


Sustainability: per country

- Artisanal Opportunity
- Food Provision
- Natural Products
- Carbon Storage
- Coastal Protection
- Tourism & Recreation
- Livelihoods & Economies
- Sense of Place
- Biodiversity
- Clean Waters

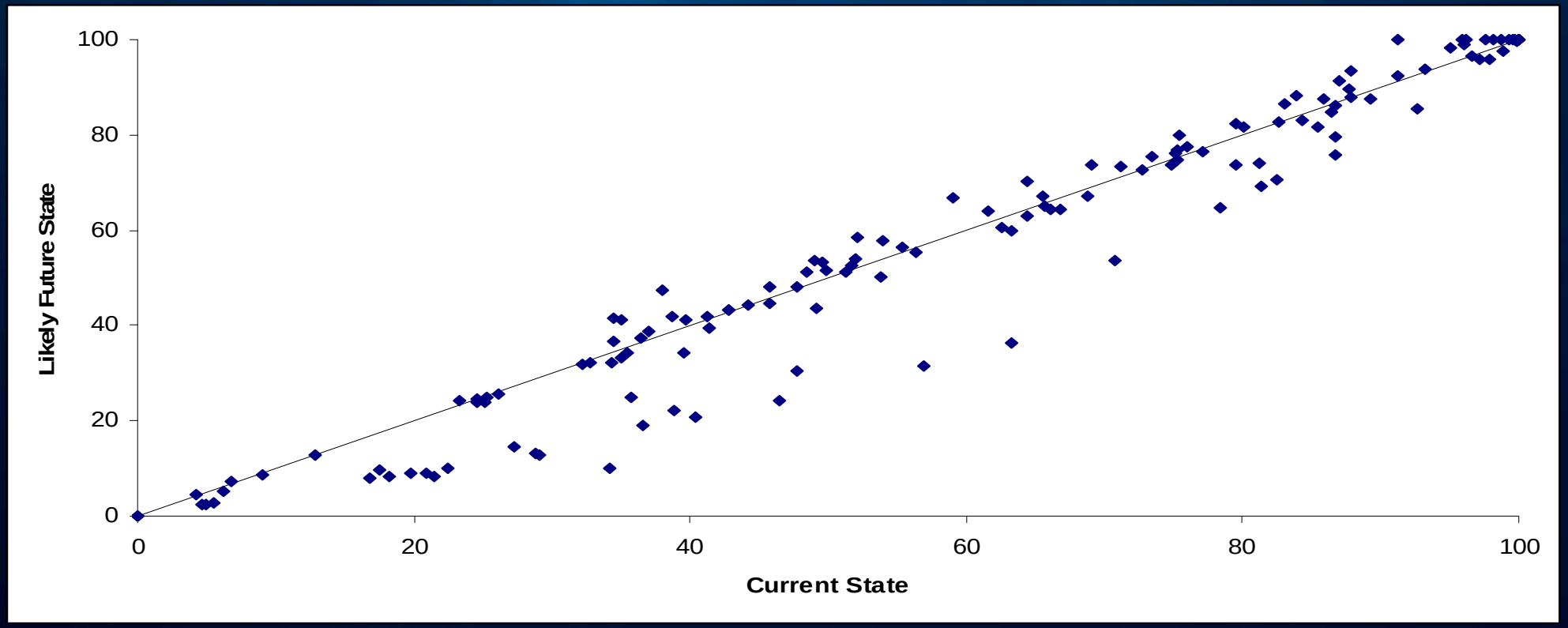


Sustainability: per goal



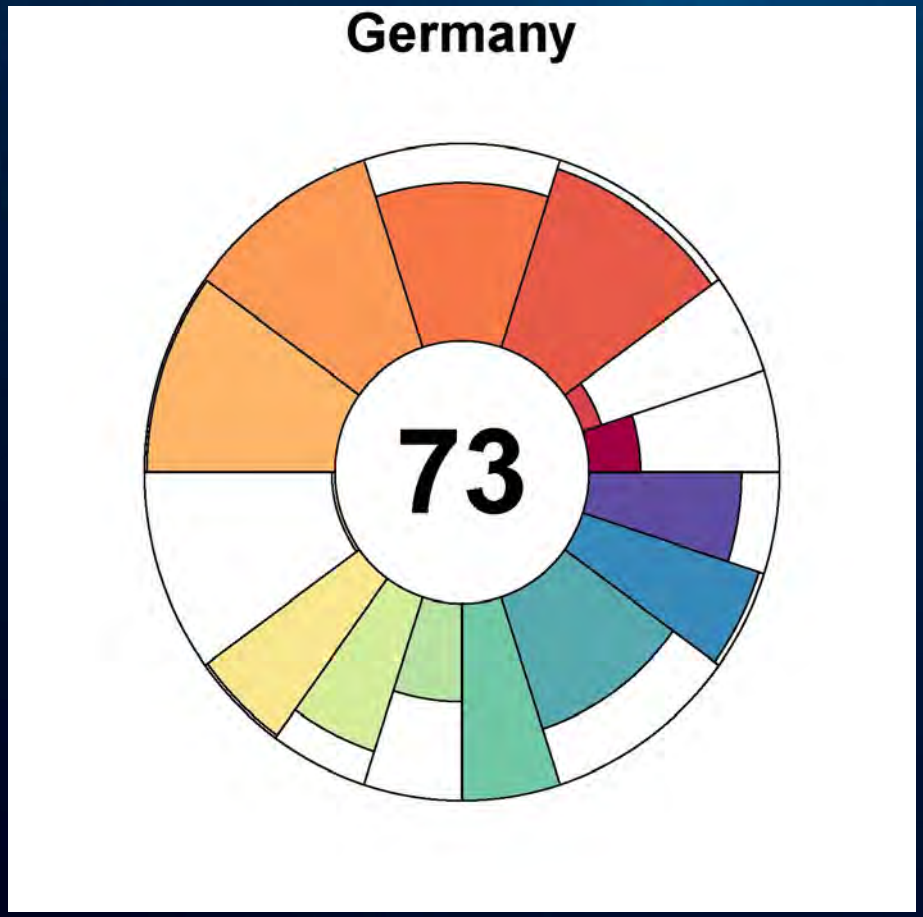
Biodiversity

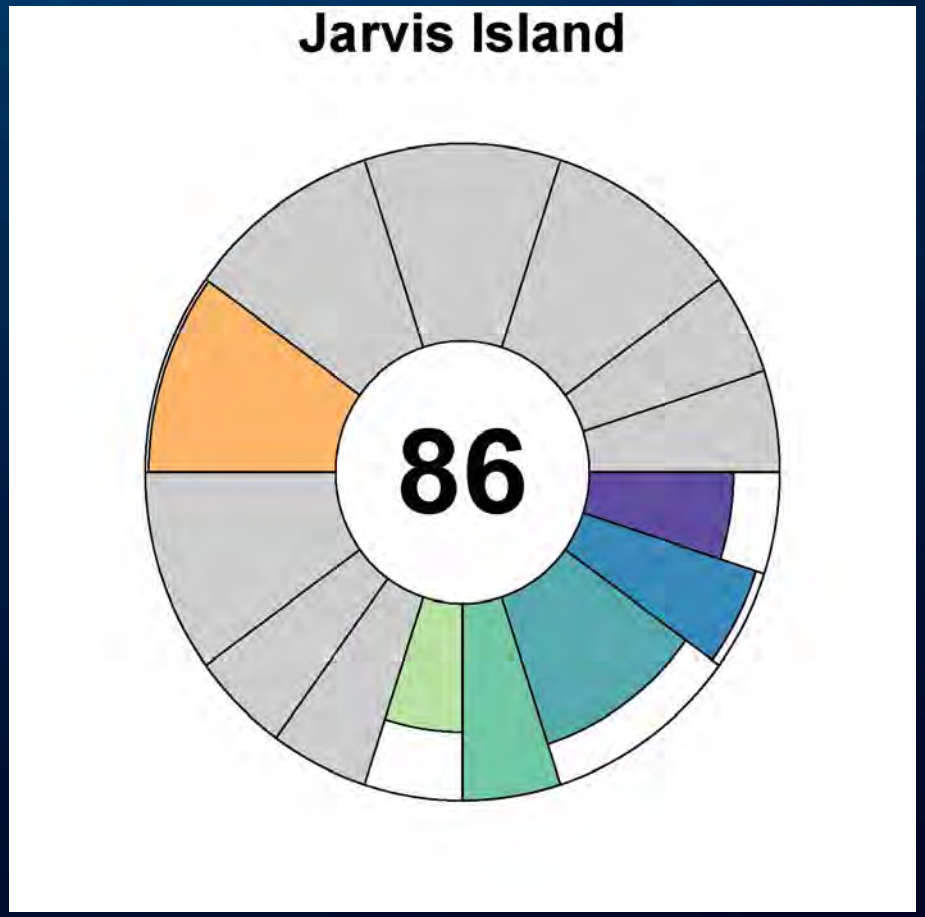
Sustainability: per goal



Coastal Protection

Coupled-Systems: human benefits central to Index





Summary

- Consistent Platform
- Transparent
- Quantitative
- Applicable at different scales
- Flexible
- Responds to management changes
- Based on the best information available at the global level

Next Steps

- Regional applications: Brazil, CA Current, Fiji
- Update global models and data, as possible; annual updates
- Tool development
- Outreach to countries and agencies
- Include high seas

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