

An ecosystem risks assessment of the Norwegian Sea offshore ecoregion

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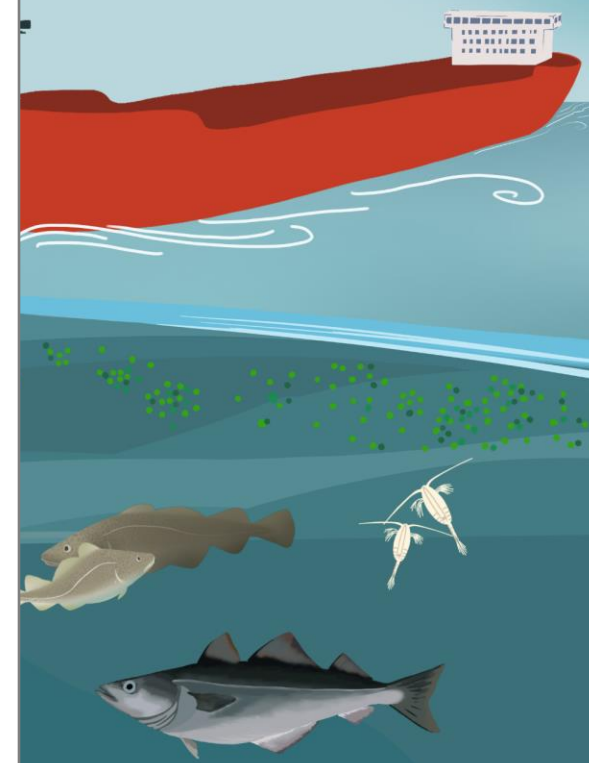
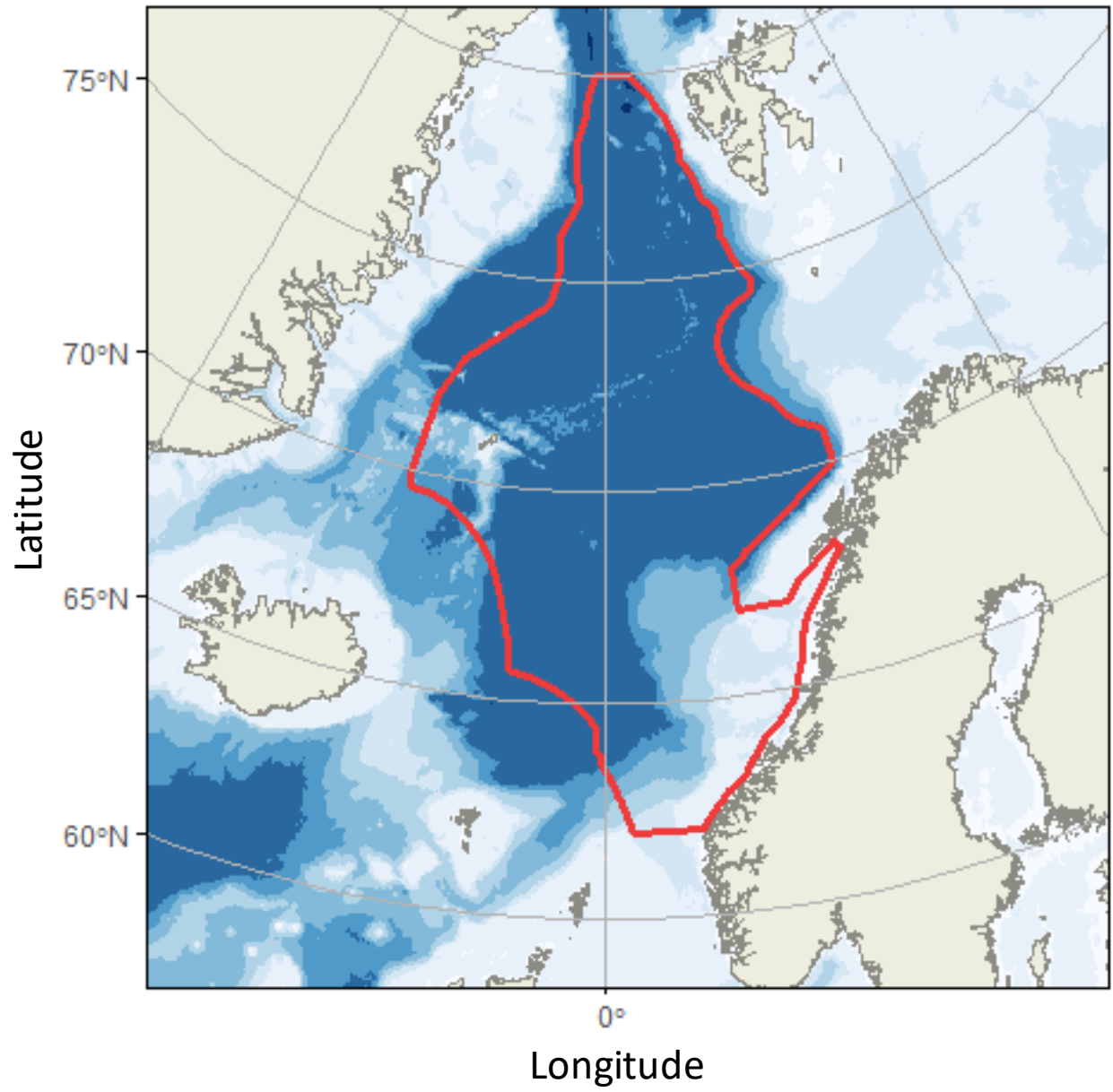


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ODEMM (Options for Delivering Ecosystem-Based Marine Management).

- expert-driven assessment approach
- Cumulative risk assessment.





Sector

Pressure

Ecological component

Norwegian Sea Offshore Ecoregion

- Research
- Shipping
- Fishing
- Military
- Non-renewable (Oil & Gas)
- Agriculture
- Land-based Industry
- Tourism/Recreation
- Coastal infrastructure
- Navigational Dredging
- Waste water
- Aquaculture

- Species Extraction
- Contaminants
- Bycatch
- Noise
- Litter
- Non-living Resources
- Siltation / Smothering
- Sealing
- Abrasion

- Pelagic fish
- Cephalopods
- Seabirds
- Marine Mammals
- Pelagic Elasmobranchs
- Demersal Fish
- Demersal Elasmobranchs
- Shelf Pelagic
- Oceanic Pelagic
- Deep Sea Fish
- Deep Sea Elasmobranchs
- Shelf Sediment
- Shelf Rock & Reef
- Slope Sediment
- Slope Rock & Reef
- Deep Sea Sediment
- Deep Sea Rock & Reef

Sector

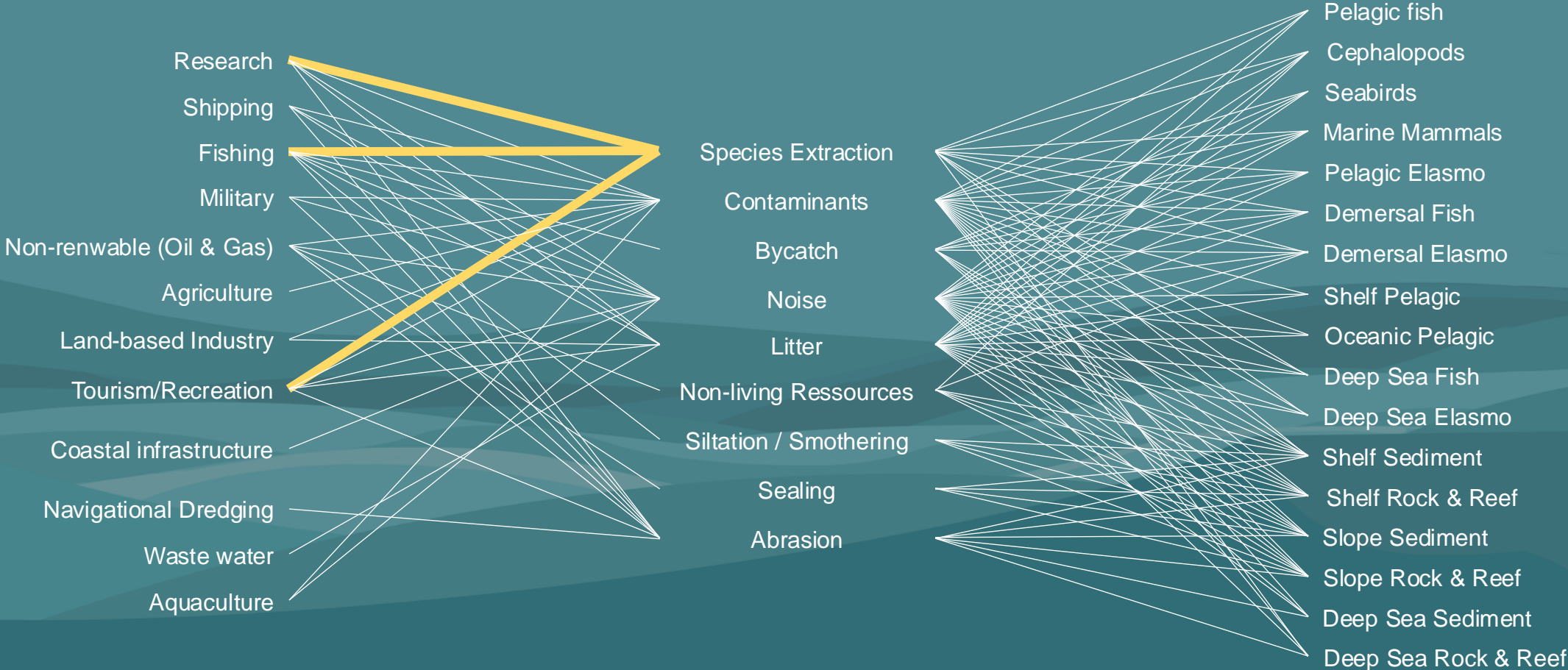


Pressure



Ecological component

Norwegian Sea Offshore Ecoregion



Spatial Extent

- Site (<5% Overlap)
- Local (5 -50% Overlap)
- Widespread (>50% Overlap)

Frequency

- Rare
- Occasional
- Comon
- Persistant

Degree of impact

- Low
- Chronic
- Acute

Spatial Extent

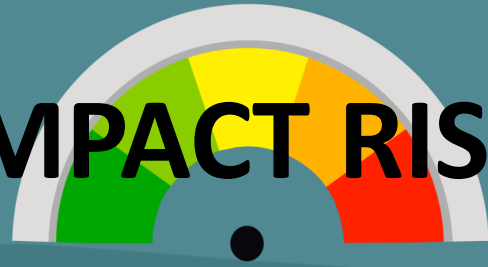
X

Frequency

X

Degree of impact

IMPACT RISK



Spatial Extent

X

Frequency

X

Degree of impact

IMPACT RISK

Knowledge quality:





Spatial Extent

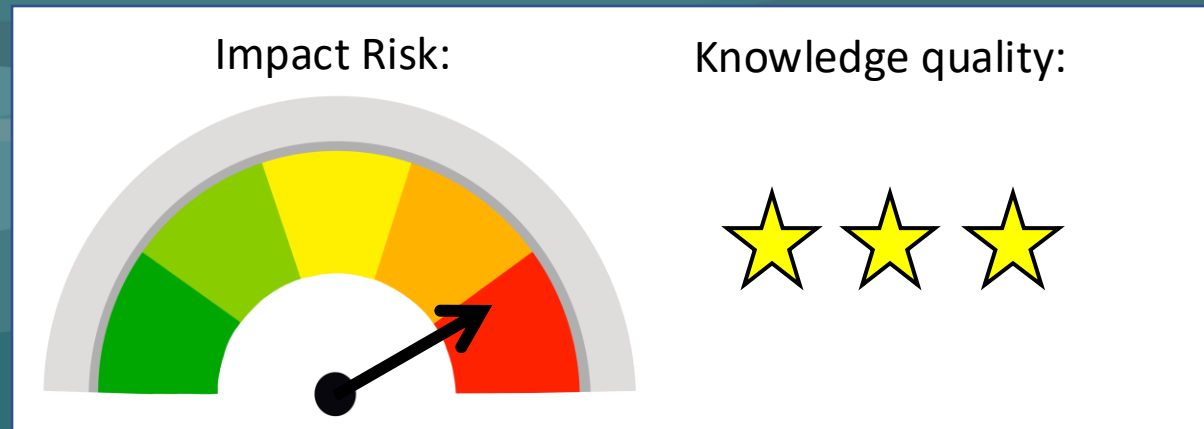
● Local
(5 -50% Overlap)

Frequency

● Persistent

Degree of Impact

● Acute





Spatial Extent

Frequency

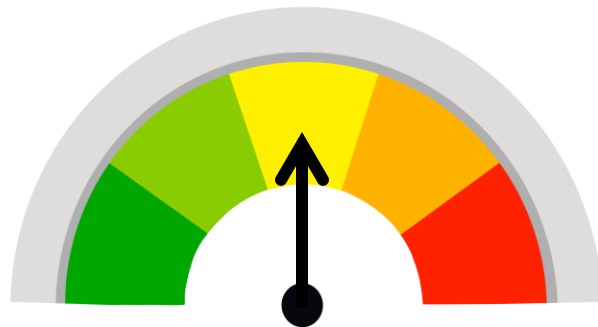
Degree of Impact

● Local (5 -50% Overlap)

● Occasional

● Low

Impact Risk:



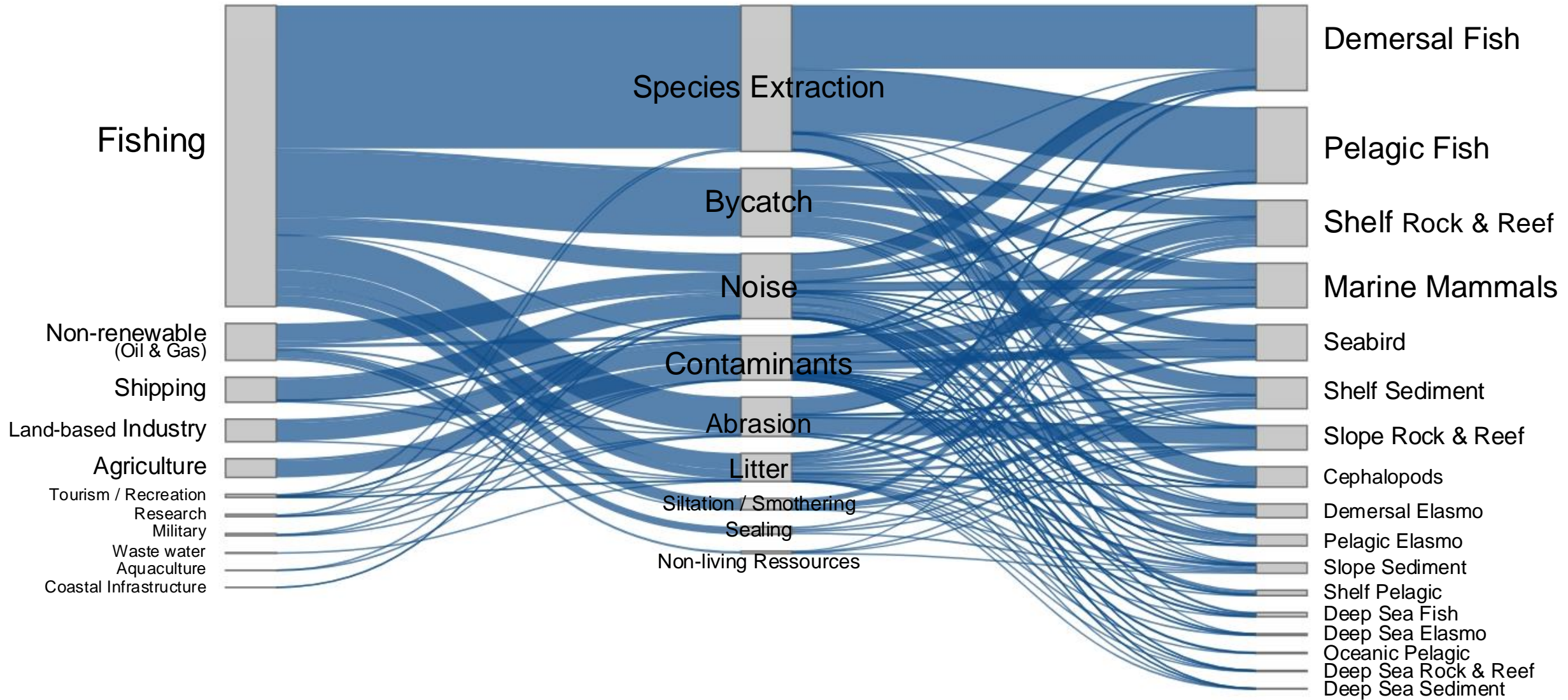
Knowledge quality:



Sector

Pressure

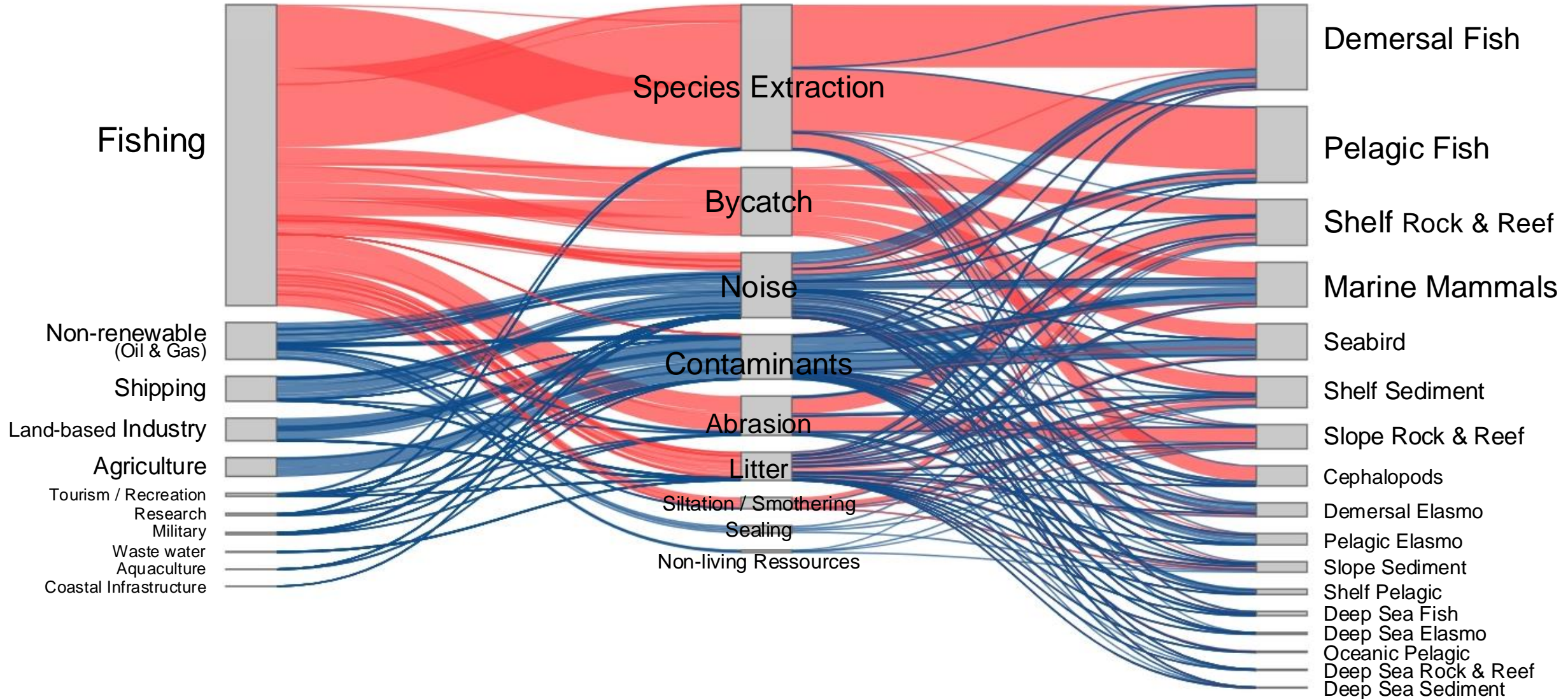
Ecological component



Sector

Pressure

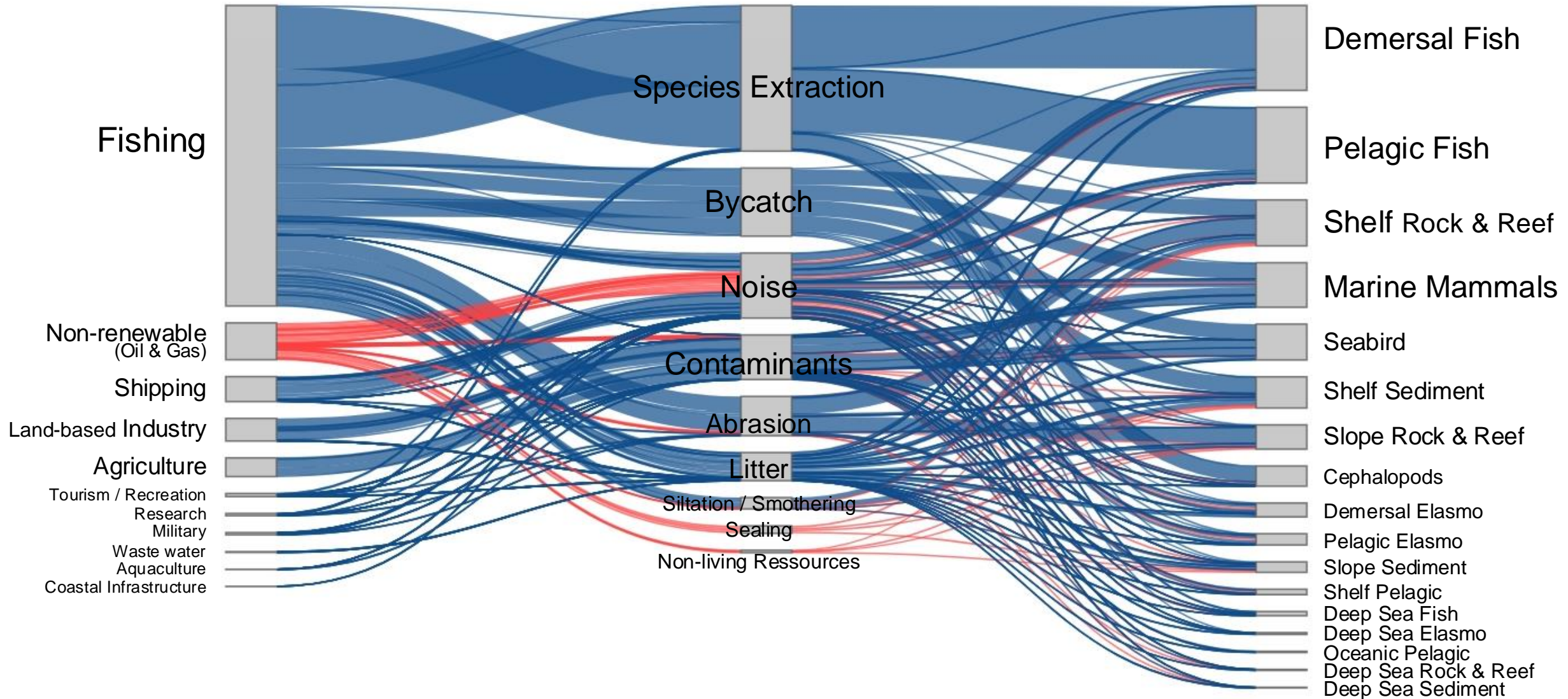
Ecological component

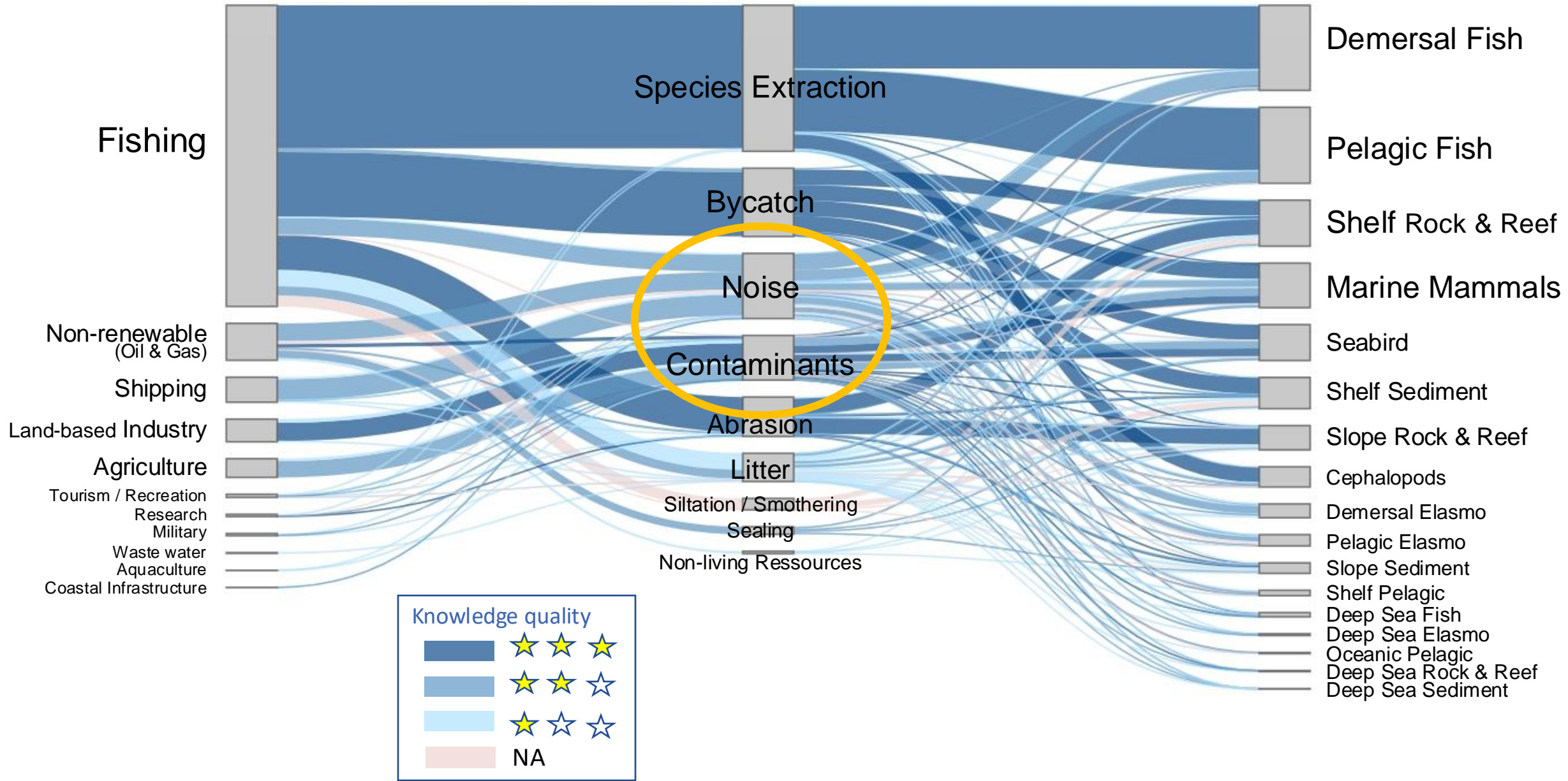


Sector

Pressure

Ecological component





Fishing

Species Extraction

Bycatch

Noise

Contaminants

Abrasion

Litter

Siltation / Smothering

Sealing

Non-living Resources

Non-renewable
(Oil & Gas)

Shipping

Land-based Industry

Agriculture

Tourism / Recreation

Research

Military

Waste water

Aquaculture

Coastal Infrastructure

Demersal Fish

Pelagic Fish

Shelf Rock & Reef

Marine Mammals

Seabird

Shelf Sediment

Slope Rock & Reef

Cephalopods

Demersal Elasmo

Pelagic Elasmo

Slope Sediment

Shelf Pelagic

Deep Sea Fish

Deep Sea Elasmo

Oceanic Pelagic

Deep Sea Rock & Reef

Deep Sea Sediment

Vulnerability

Persistence

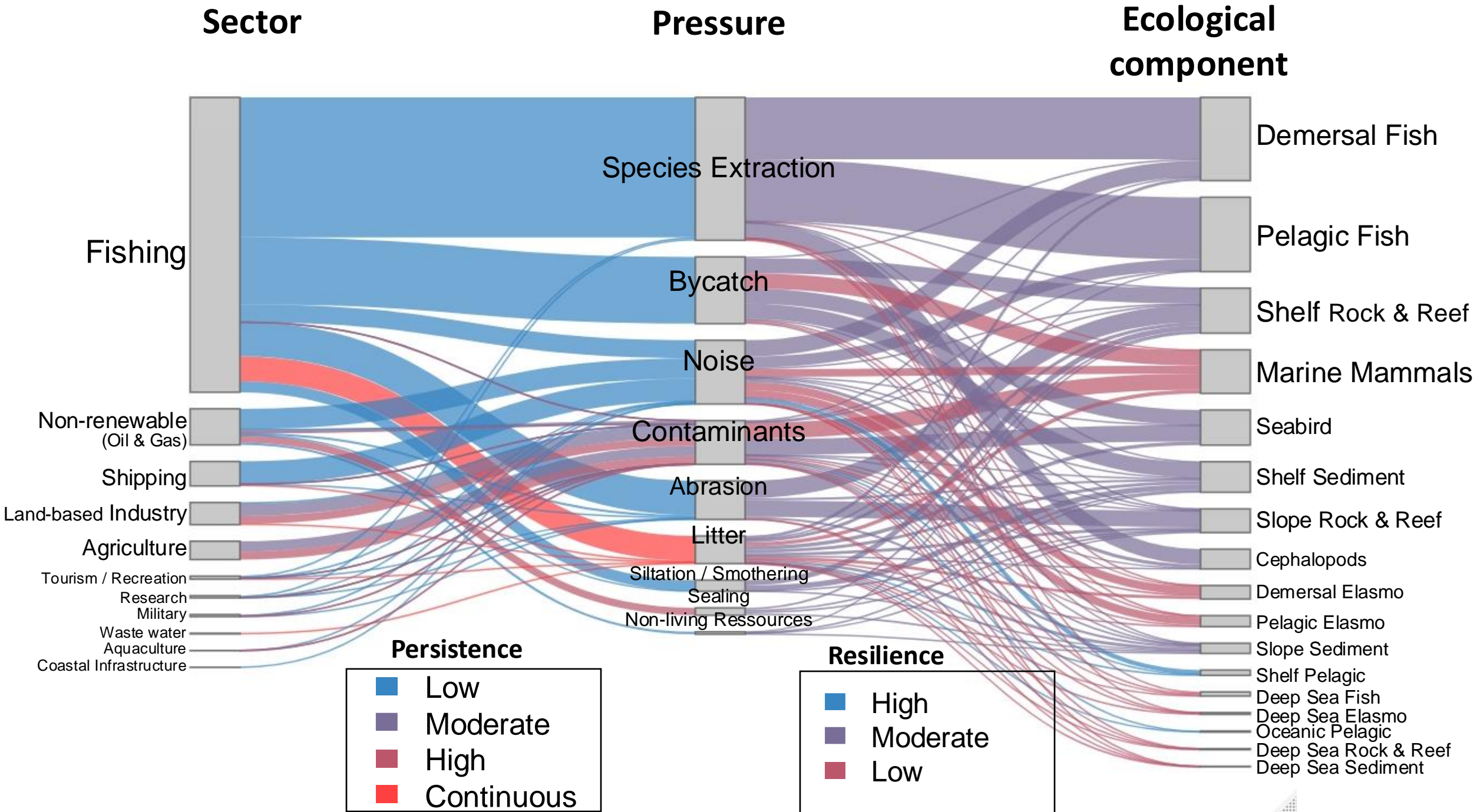
How long the pressure persists in the environment, after cessation of the causal activity

- **Low (0-2 years)**
- **Moderate (2-10 years)**
- **High (10-100 years)**
- **Continuous (100+ years)**

Resilience

How long it takes for the ecological component to recover to pre-impact conditions

- **High (0-2 years to recovery)**
- **Moderate (2-10 years to recovery)**
- **Low (10-100 years to recovery)**



Take home message

- Major risks in the Norwegian Sea:
 - Fishing, Oil and Gas, Shipping, Land-based industry and agriculture
 - Species extraction, bycatch, noise and contaminants
- Risk ranking can guide management of ecological risks,
- Quantify expected response time of management actions.

Thank you for your attention !

