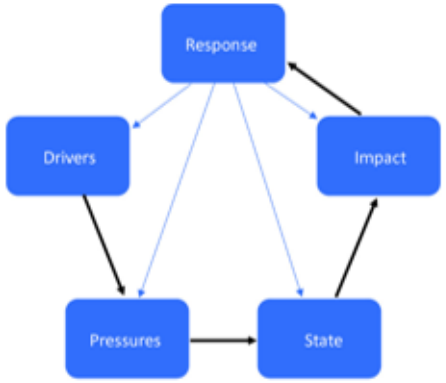
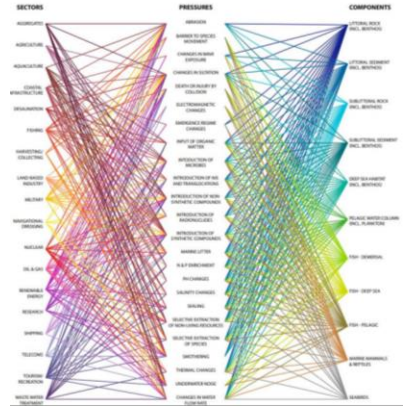
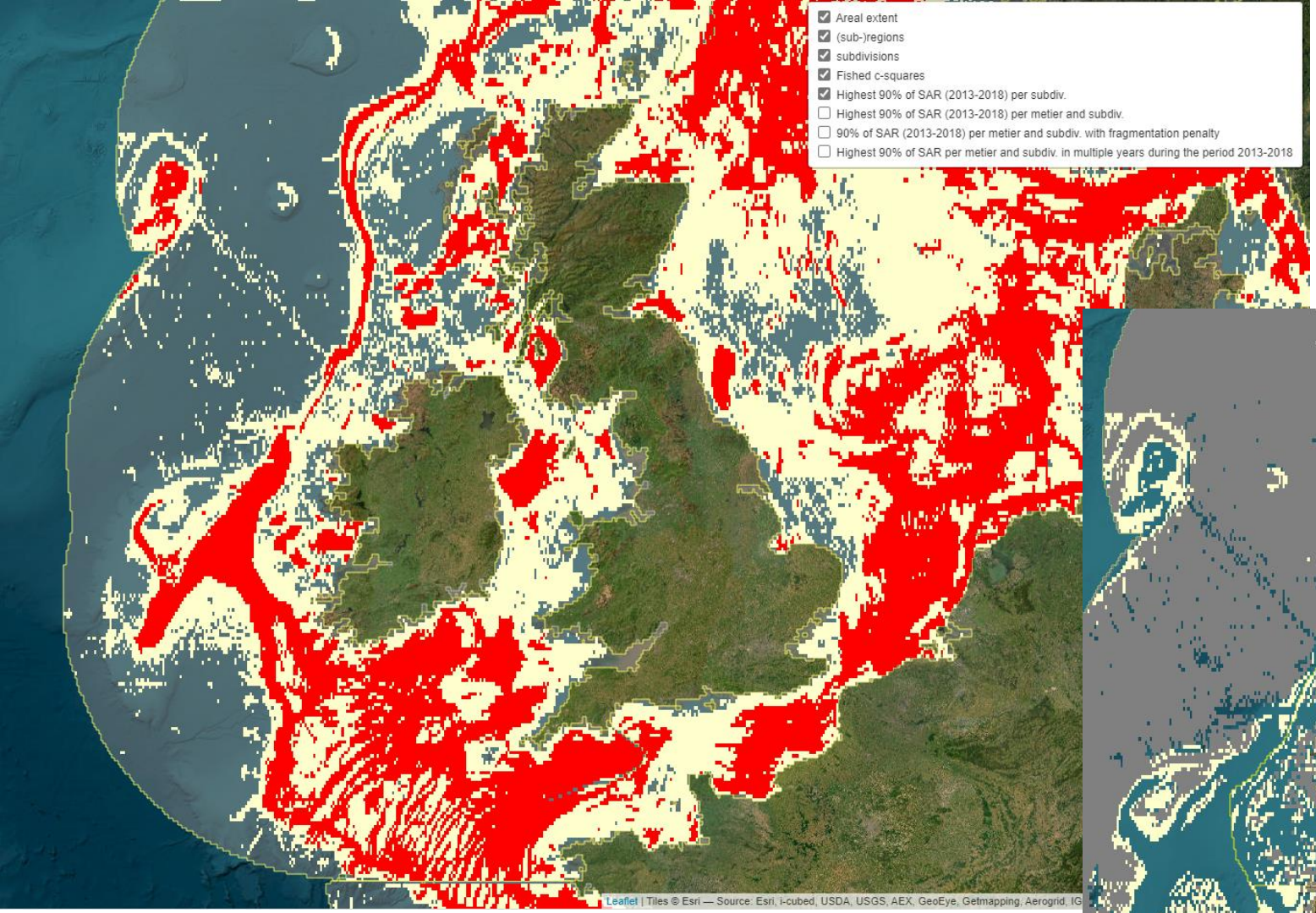
Interaction of Marine Activities in Irish Waters

Eugene Nixon TUD

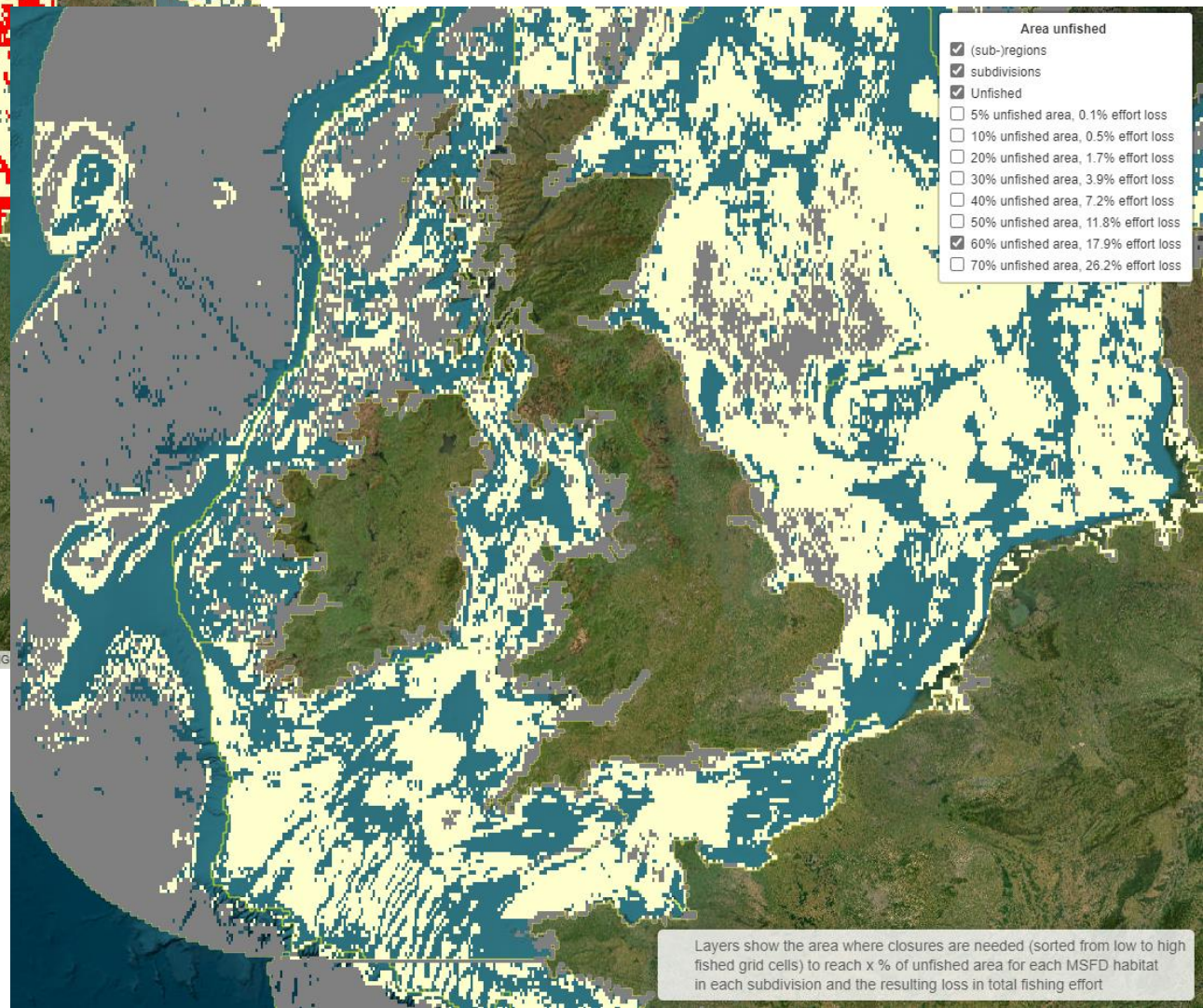
- Marine Activities
  - Fishing
  - Shipping
  - Offshore Wind
- Interactions
  - Where these activities occur (Co-existence)
  - What pressures they exert on the ecosystem (JNCC)
  - Modelling pressures – in space and time
  - Sensitivity of receiving ecosystem – in space and time
- *An attempt to conceptualise*:







With a reduction of 18% of the effort, focused in the least fished (important) grounds, you achieve 60% of all MSFD areas not impacted by bottom trawled.



https://doi.org/10.17895/ices.advice.25601121

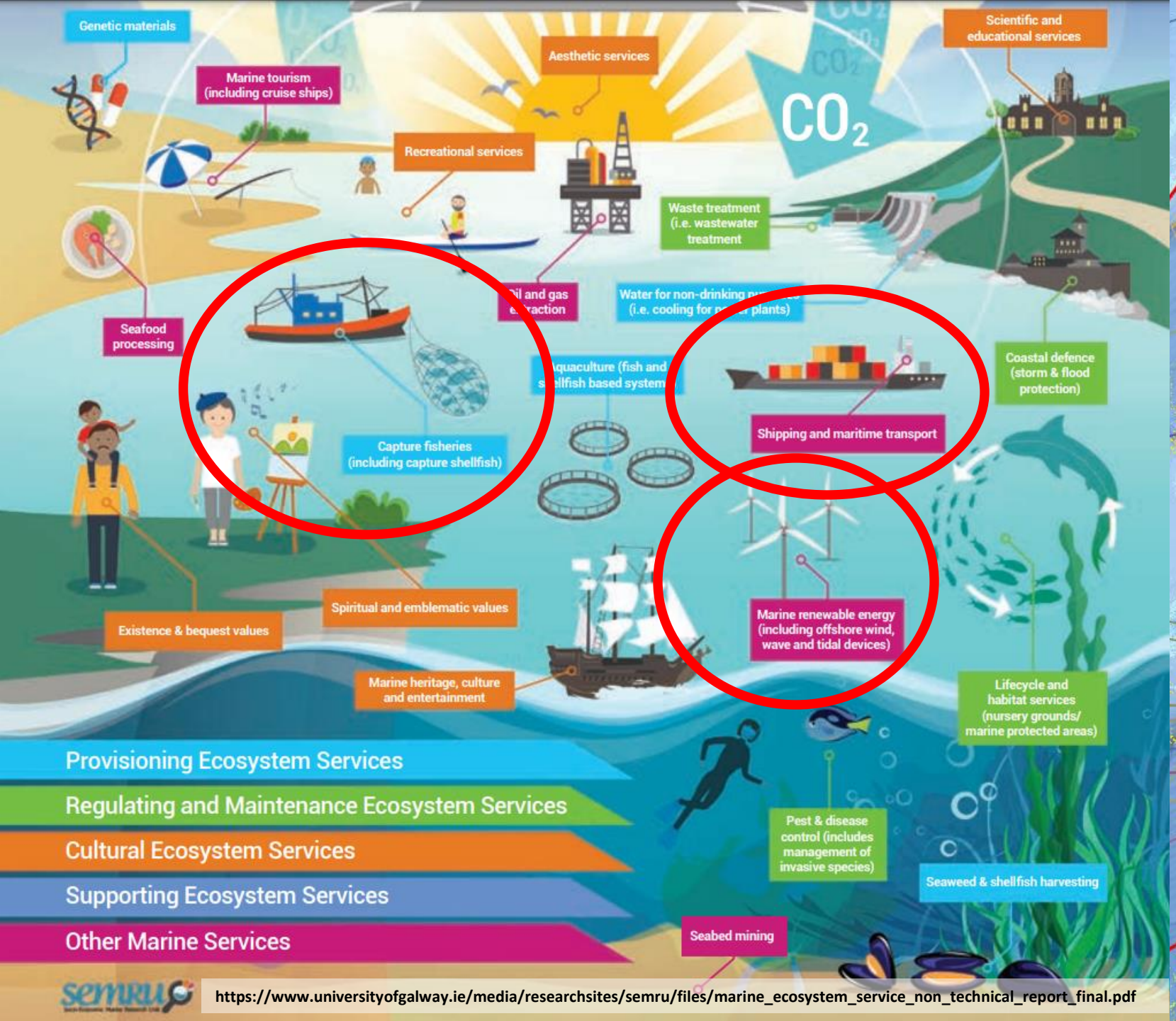
- **Contains 92 Polices**
- **Apply an ecosystem-based approach**
- **Optimise the use of space, co-existence and co-operation**
- **Best available**
  - **Data**
  - **Scientific knowledge & science**
  - **Evidence**
- **Decision-makers will need to apply the best available evidence** *and the precautionary principle.*
- Natural native habitat connectivity, trophic guilds & foodweb, ability to adapt to climate change, natural capital, functioning and provision of ecosystem services.

The 2023 Ocean Economy report shows that Ireland's ocean economy, in nominal terms:

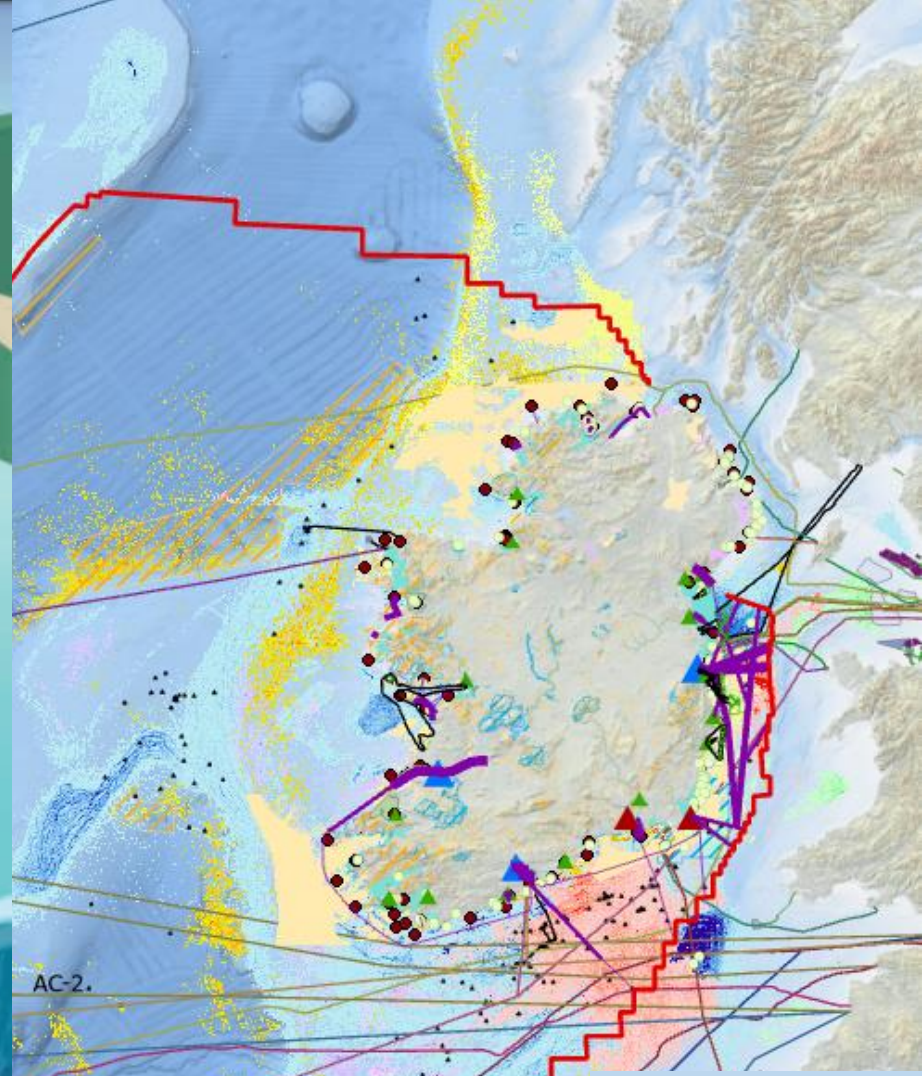
- generates over €7 billion in turnover;
- has a direct economic contribution, as measured by Gross Value Added, of €2.85 billion; and
- employs approximately 33,500 Full-Time Equivalents.

Table 1: Direct Turnover, GVA and Employment by industry, 2022

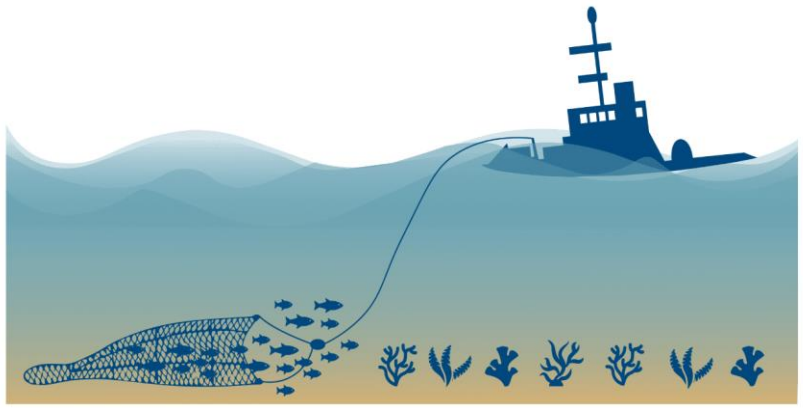
2022 (estimates)	Direct Turnover € 000's	Direct GVA € 000's	Direct Employment (FTEs)
Shipping & Maritime Transport	2,446,006	664,725	4,728
Tourism in Marine & Coastal Areas	1,229,072	535,799	18,325
International Cruise	33,743	13,119	
Marine Retail Services	152,694	64,131	925
Marine Commerce	305,884	91,516	479
Sea Fisheries	239,626	119,904	1714
Marine Aquaculture	186,071	68,000	1170
Seafood Processing	618,010	172,786	2695
Seaweed, Marine Biotechnology & Bioproducts	122,890	47,872	768
Marine Manufacturing, Construction & Engineering	170,523	75,115	937
Oil and Gas Exploration & Production	1,272,297	886,151	160
Marine Renewable Energy	83,859	54,148	642
Advanced Marine Technology Products & Services	151,016	58,896	909
Total	**7,011,691**	**2,852,162**	**33,452**



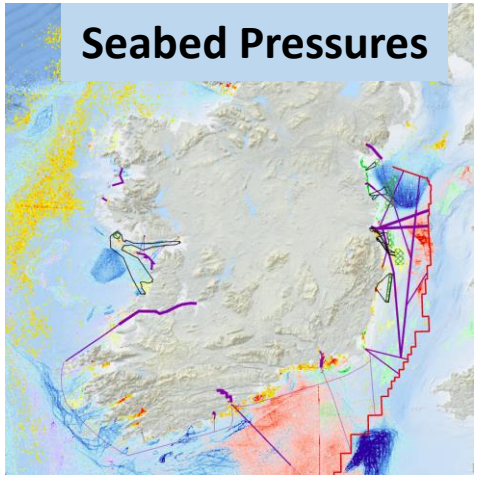
https://www.universityofgalway.ie/media/researchsites/semru/files/marine_ecosystem_service_non_technical_report_final.pdf

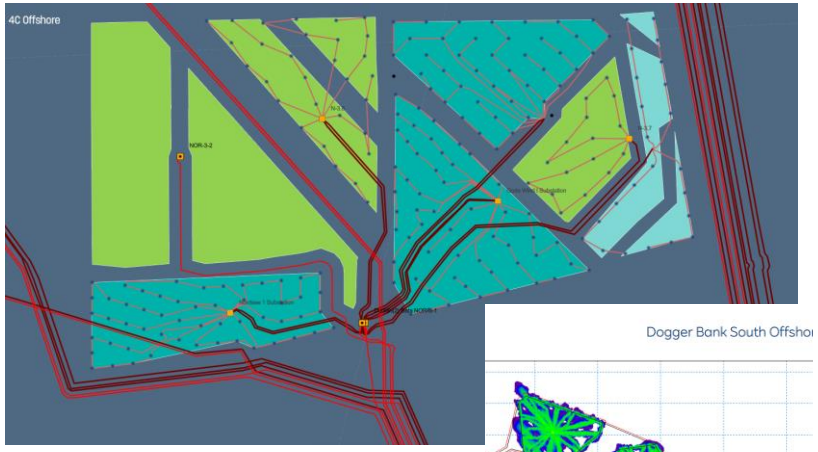


Best Available Data
MarinePlan.ie
Ireland's Marine Atlas
INFORMAR
NPWS
GSI
EMODNet
OSPAR
UK Crown Estate



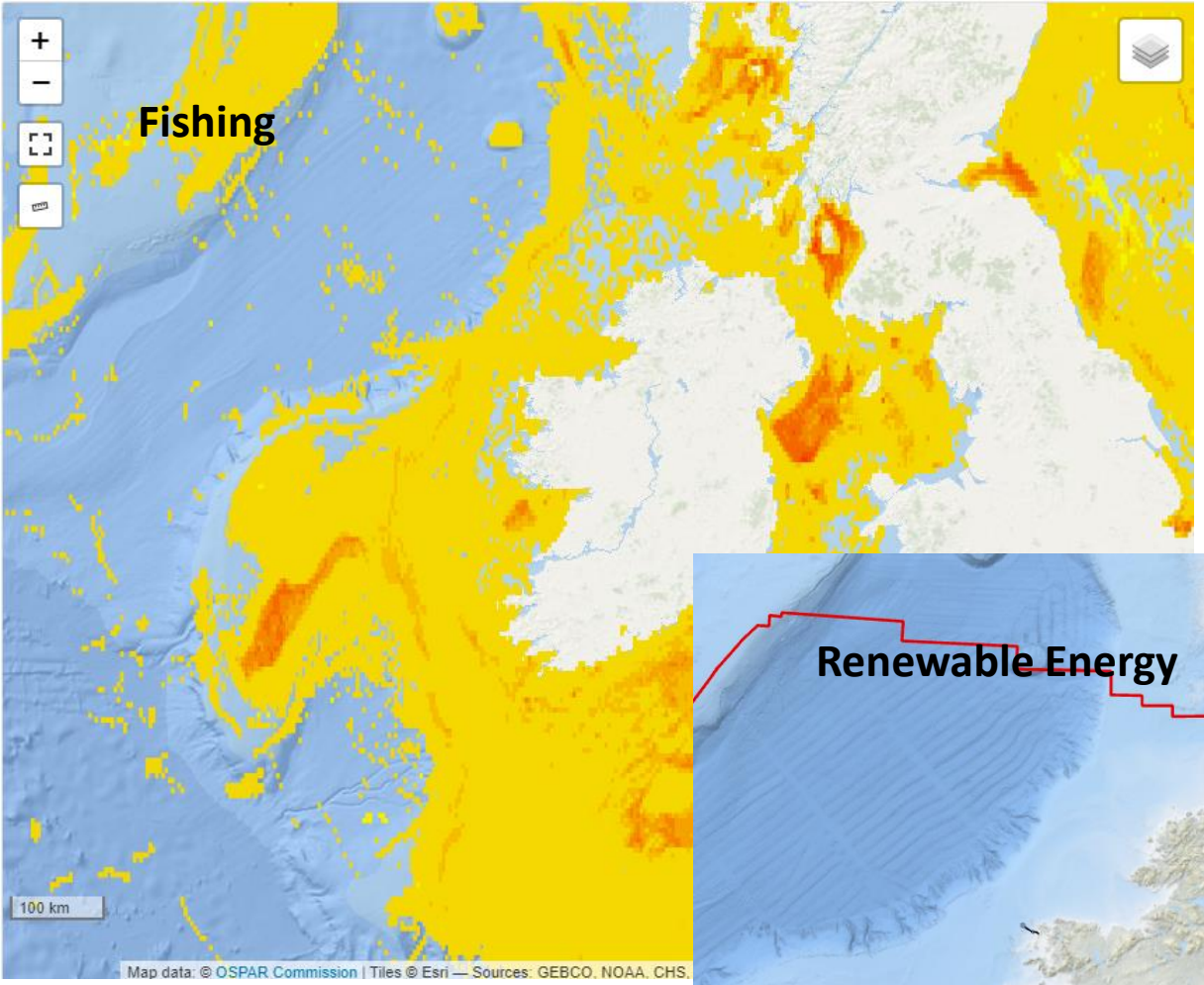
- Managed by quotas -> ecosystem triggers
- CFP – Spatial measures – VME/Irish Box
- Impact – SAR mobile bottom gear - 0.43



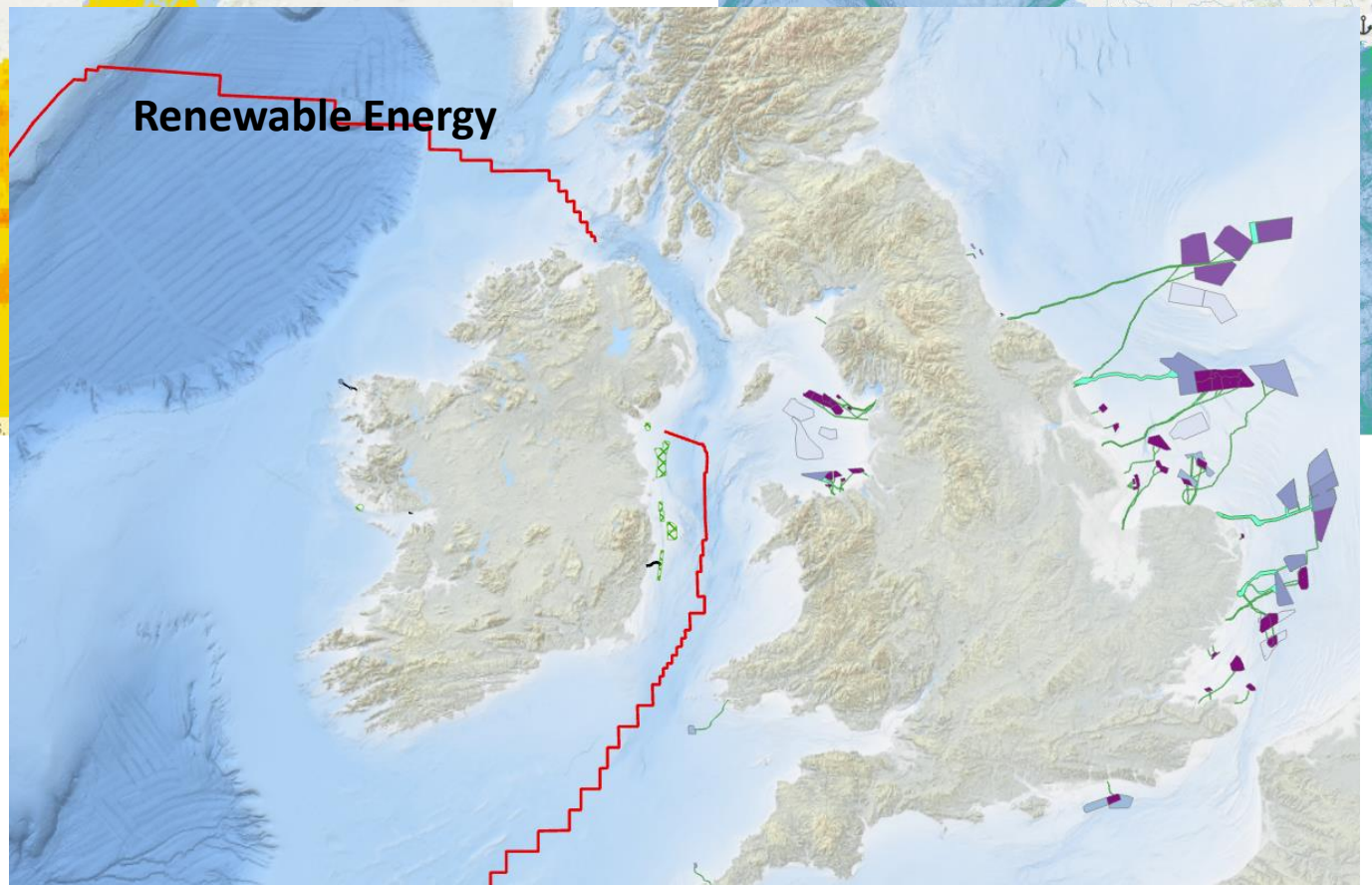


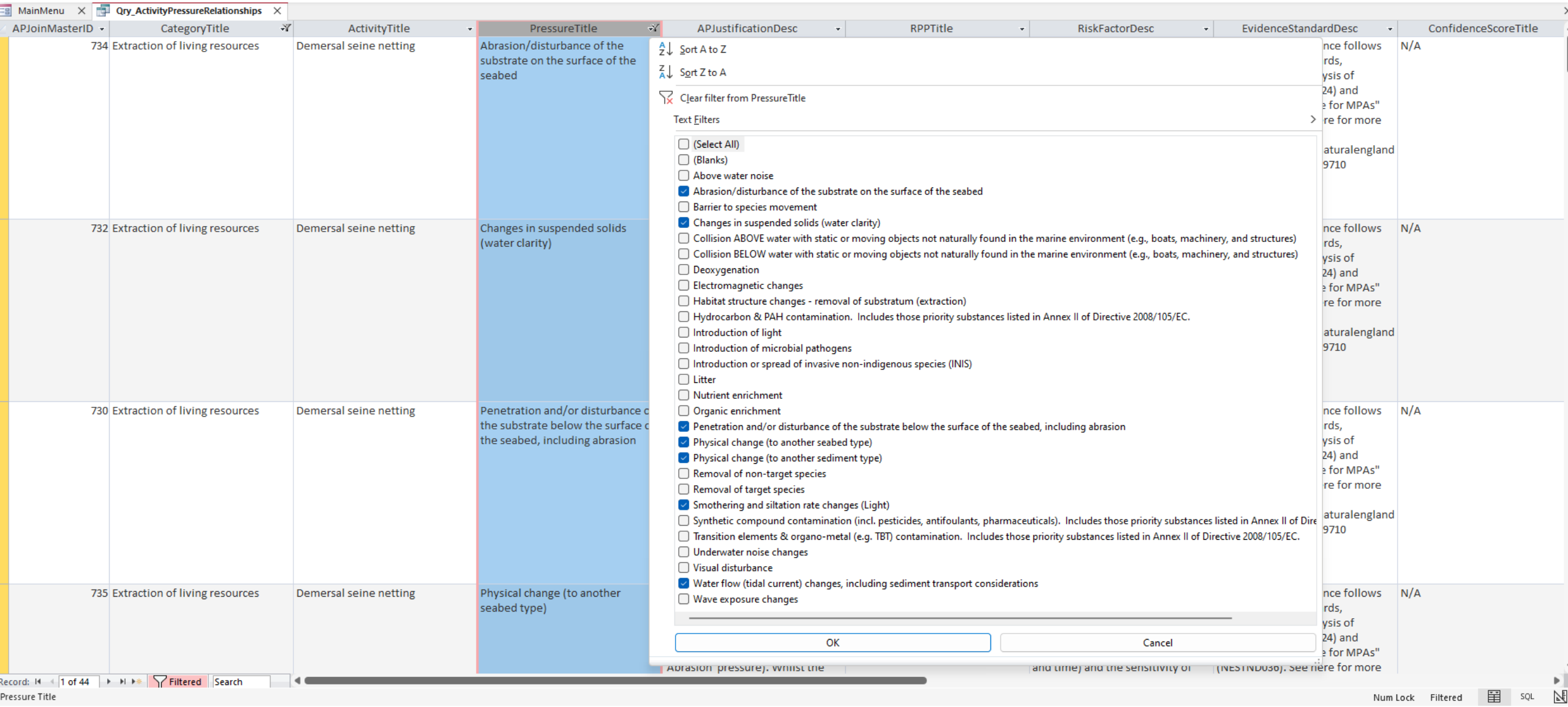
- Construction
- https://map.4coffshore.com/offshorewind/
- Bed preparation
- Installation of infrastructure

- IMO vessel operations
- Ballast water and NIS
- Speed controls
- Navigational dredging/dumping

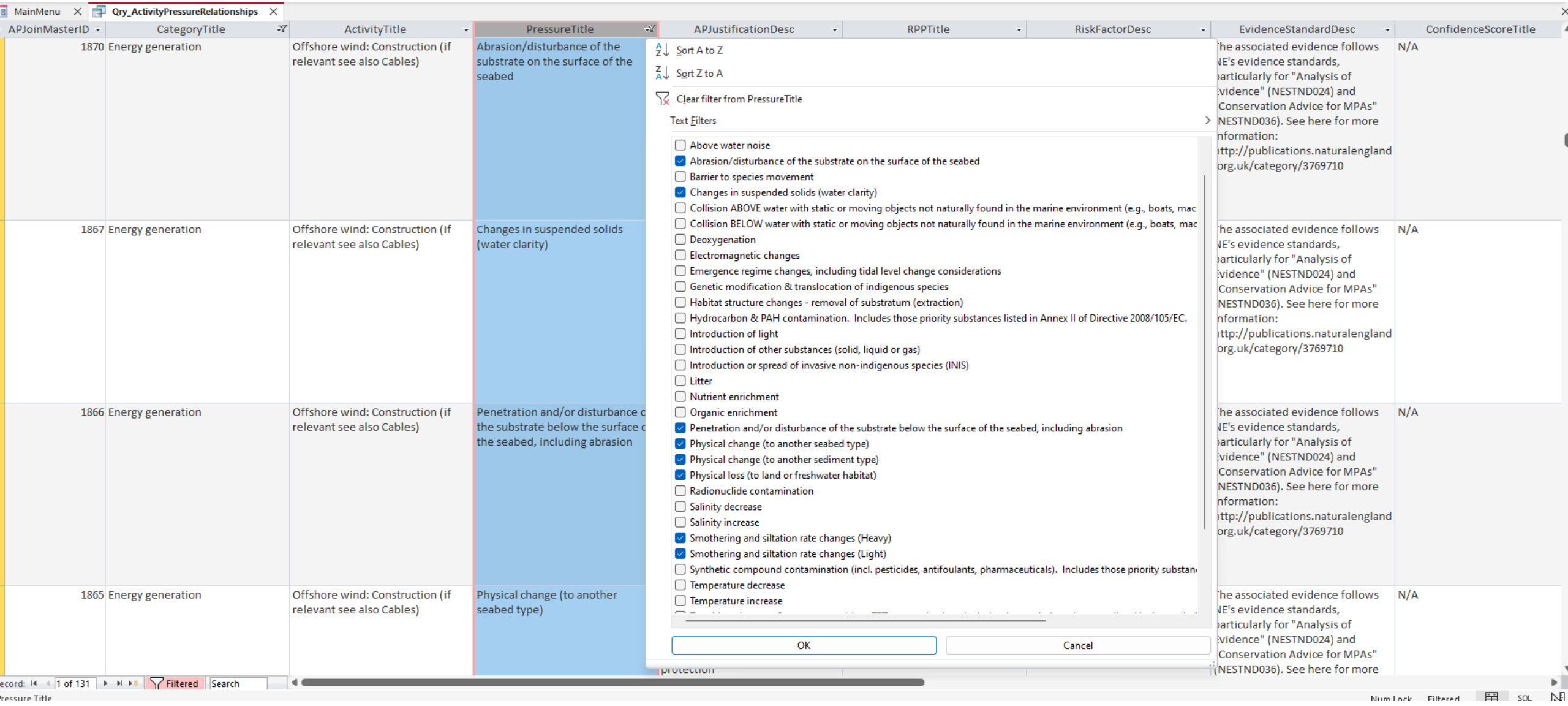

Fishing
100 km
Map data: © OSPAR Commission | Tiles © Esri — Sources: GEBCO, NOAA, CHS,


Shipping
Esri, GEBCO, Garmin, NaturalVue
Powered by
EMODnet


Renewable Energy



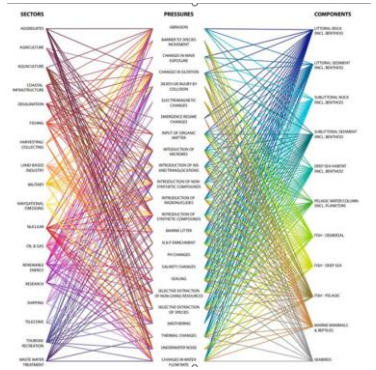
https://hub.jncc.gov.uk/assets/97447f16-9f38-49ff-a3af-56d437fd1951



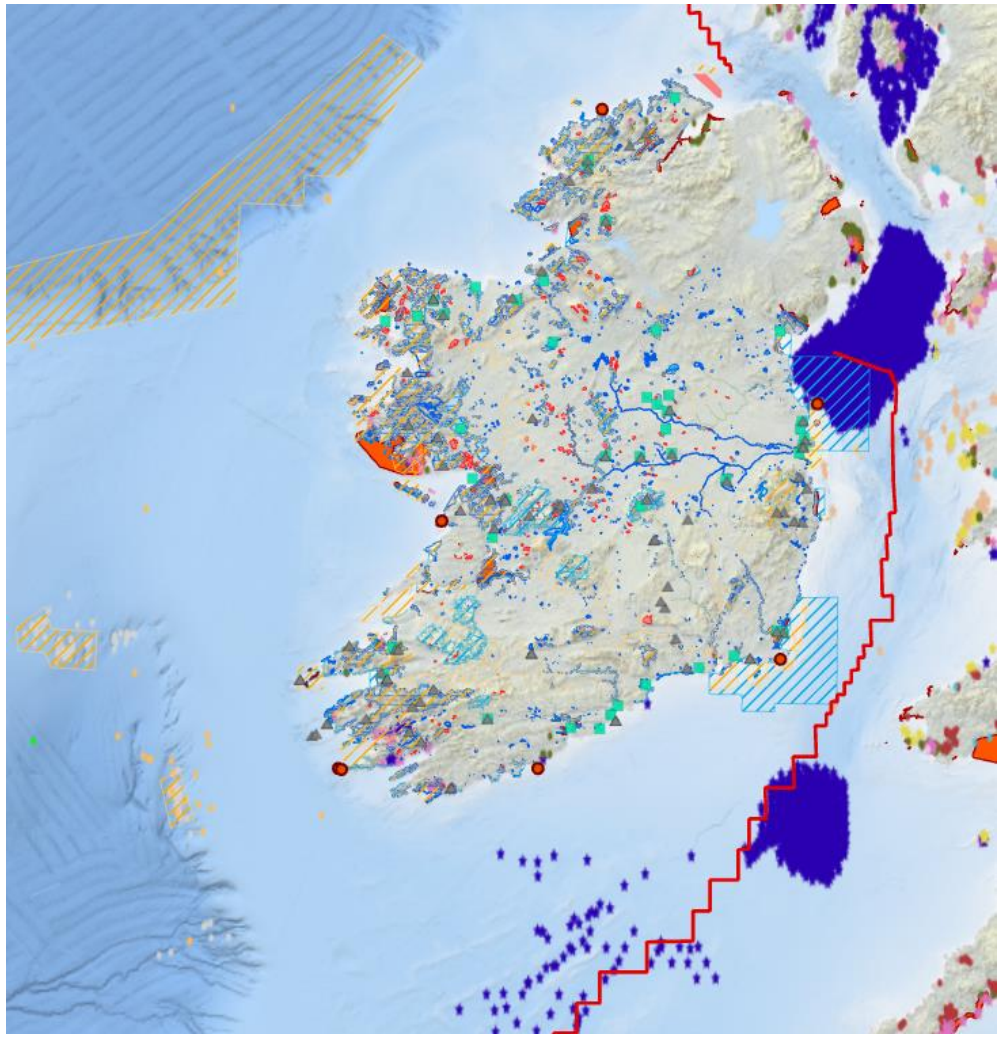
https://hub.jncc.gov.uk/assets/97447f16-9f38-49ff-a3af-56d437fd1951

	Transport Pressures	Offshore Wind Pressures	Fishing Pressures
1	Above water noise	Above water noise	Above water noise
2	Abrasion/disturbance of the substrate on the surface of the seabed	Abrasion/disturbance of the substrate on the surface of the seabed	Abrasion/disturbance of the substrate on the surface of the seabed
3	Barrier to species movement	Barrier to species movement	Barrier to species movement
4	Changes in suspended solids (water clarity)	Changes in suspended solids (water clarity)	Changes in suspended solids (water clarity)
5	Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Collision ABOVE water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)
6	Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)	Collision BELOW water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)
7	Deoxygenation	Habitat structure changes - removal of substratum (extraction)	Deoxygenation
8	Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Electromagnetic changes
9	Introduction of light	Introduction of light	Habitat structure changes - removal of substratum (extraction)
10	Introduction of other substances (solid, liquid or gas)	Introduction of other substances (solid, liquid or gas)	Hydrocarbon & PAH contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.
11	Introduction or spread of invasive non-indigenous species (INIS)	Introduction or spread of invasive non-indigenous species (INIS)	Introduction of light
12	Litter		l pathogens
13	Nutrient enrichment		f invasive non-indigenous species (INIS)
14	Organic enrichment		
15	Penetration and/or disturbance of the substrate below the surfac of the seabed, including abrasion		
16	Physical change (to another seabed type)		
17	Physical change (to another sediment type)	Smothering and siltation rate changes (Heavy)	urbance of the substrate below the surface of the seabed, including abrasion
18	Physical loss (to land or freshwater habitat)	Smothering and siltation rate changes (Light)	Physical change (to another seabed type)
19	Smothering and siltation rate changes (Light)	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Physical change (to another sediment type)
20	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Removal of non-target species
21	Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.	Underwater noise changes	Removal of target species
22	Underwater noise changes	Vibration	Smothering and siltation rate changes (Light)
23	Visual disturbance	Visual disturbance	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals). Includes those priority substances listed in Annex II of Directive 2008/105/EC.
24	Water flow (tidal current) changes, including sediment transport considerations	Water flow (tidal current) changes, including sediment transport considerations	Transition elements & organo-metal (e.g. TBT) contamination. Includes those priority substances listed in Annex II of Directive 2008/105/EC.
25	Wave exposure changes	Wave exposure changes	Underwater noise changes
26			Visual disturbance
27			Water flow (tidal current) changes, including sediment transport considerations
28			Wave exposure changes

Science can map these pressures



Sensitivity of the receiving Ecosystem



1. NATURA: Species & Habitats Conservation Objectives
2. NMPF: Important Species/Habitats
   Co-existance/Space
   Ecosystems Services – spawning/seed
3. MSFD: GES – 11 Descriptors

MSFD

- **Descriptor 1:** Biodiversity is maintained
- **Descriptor 2:** Non-indigenous species do not adversely alter ecosystems
- **Descriptor 3:** Populations of commercial fish and shellfish species are healthy
- **Descriptor 4:** Food webs ensure long-term abundance and reproduction of species
- **Descriptor 5:** Eutrophication is reduced
- **Descriptor 6:** Sea floor integrity ensures the proper functioning of ecosystems
- **Descriptor 7:** Permanent alteration of hydrographical conditions does not adversely affect ecosystems
- **Descriptor 8:** Concentrations of contaminants give no pollution effects
- **Descriptor 9:** Contaminants in seafood are at safe levels
- **Descriptor 10:** Marine litter does not cause harm
- **Descriptor 11:** Introduction of energy (including underwater noise) does not adversely affect the ecosystem

Ecosystem Considerations

Understanding of the effects on the ecosystem requires information on:

- Activity (fishing/shipping/ORE) – spatial extent, duration and intensity.
- Sensitivity of the receiving ecosystem –
  - Protected Area (NATURA, MPA, CFP)
  - Protected Species (Habitats Directive, OSPAR, Wildlife Act, IUCN Red Lists, Birds of Conservation Concern)
  - Everywhere else the MSFD and GES applies

- Prioritise pressures and map their spatial extent, duration and intensity
  - fishing(28)
  - Shipping (25)
  - ORE (25)

- Examine ecosystem effects of cumulative pressure - spatial extent, duration and timing and intensity on ecosystems.

Ocean Knowledge 2030 - Registration now open

23/08/2024

The Marine Institute is pleased to announce that registration is now open for the Ocean Knowledge 2030 conference to be held in Dublin on 20th - 21st November 2024.

The conference will bring together a diverse national ocean community including academic and public research bodies, government departments, state agencies, ocean business and civil society. The event will provide a forum for exchange of information, fostering syngeries and collaboration across the national system and identifying key knowledge, research and innovation actions to address ocean sustainability and blue economy challenges. It will also formally launch Ocean Knowledge 2030, Ireland's new marine research & innovation strategy.

Many thanks