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Baltic Sea Maritime Spatial Planning for Sustainable Ecosystem Services

SEANERGY
– a tool for analysing conflicts and synergies between marine human uses

Part of PhD 2017-2020

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BONUS
Science for a better future of the Baltic Sea region

We need a spatial tool for co-location

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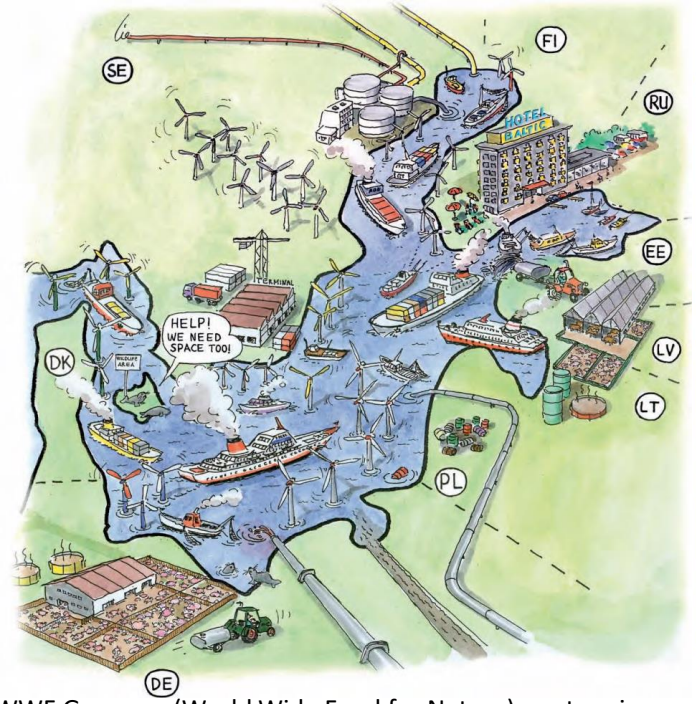
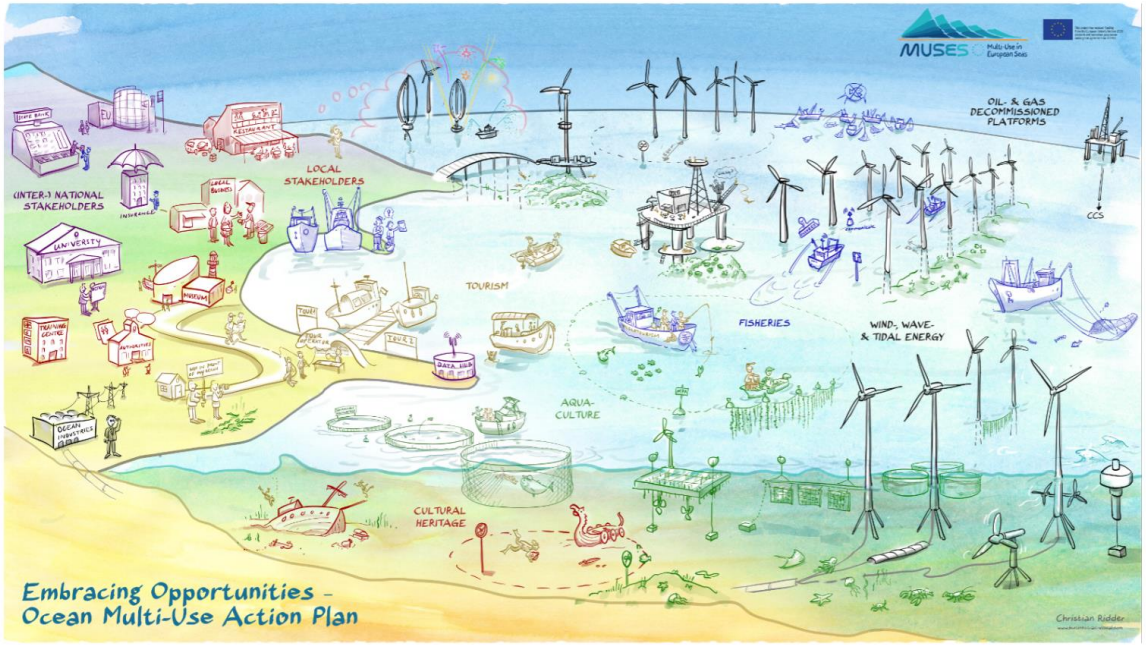
- Interactions and conflicts are increasing at Sea
- Multi-use potentials are beginning to emerge
- Promoting coexistence is a mandatory focus in MSP





https://muses-project.com/

© WWF Germany (World Wide Fund for Nature), partner in www.baltseaplan.eu

SEANERGY – a Python-based toolbox for the GIS-program ArcMap

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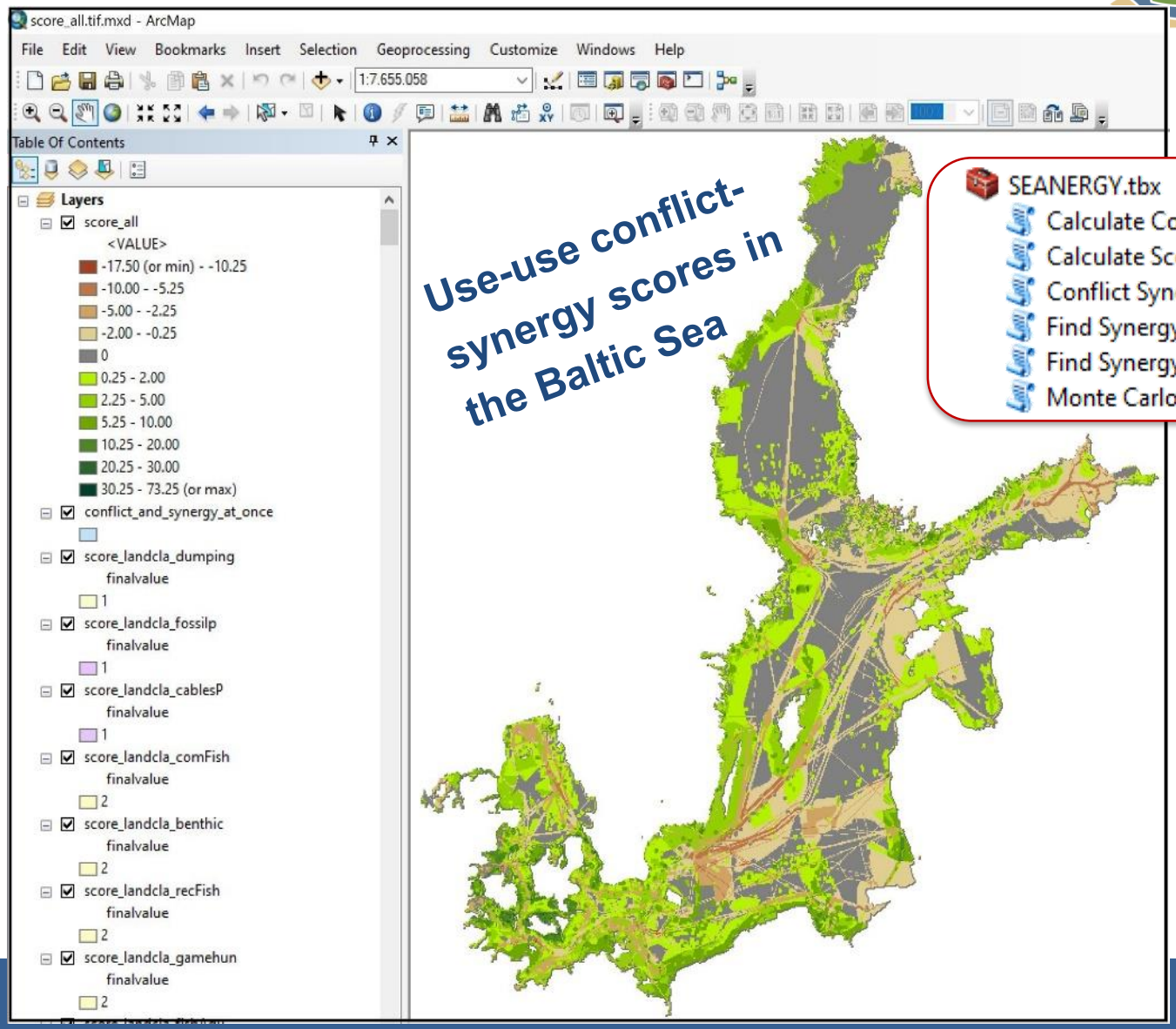

- Six tools

- Freely downloadable from Github: https://github.com/IdaMBonnevie/SEANERGY.git

- Read me file and metadata in tools

How does SEANERGY work?

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- A pairwise use-use conflict-synergy matrix approach with a s spatial twist

	Shipping	**Aquaculture**	**Recreational fishing…**	**…**
Shipping		Conflict-synergy score	Conflict-synergy score	
Aquaculture	Conflict-synergy score		Conflict-synergy score	
Recreational fishing	Conflict-synergy score	Conflict-synergy score		
…				

Baltic Sea conflict-synergy knowledge from MSP projects

Baltic SCOPE
Towards coherence and cross-border solutions in Baltic Maritime Spatial Plans

PLAN BOTHNIA

AquaSpace

MULTI-LEVEL GOVERNANCE IN MARITIME SPATIAL PLANNING THROUGHOUT THE BALTIC SEA REGION
PartiSEApate

UNESCO

MUSES Multi-Use in European Seas

How does SEANERGY work?

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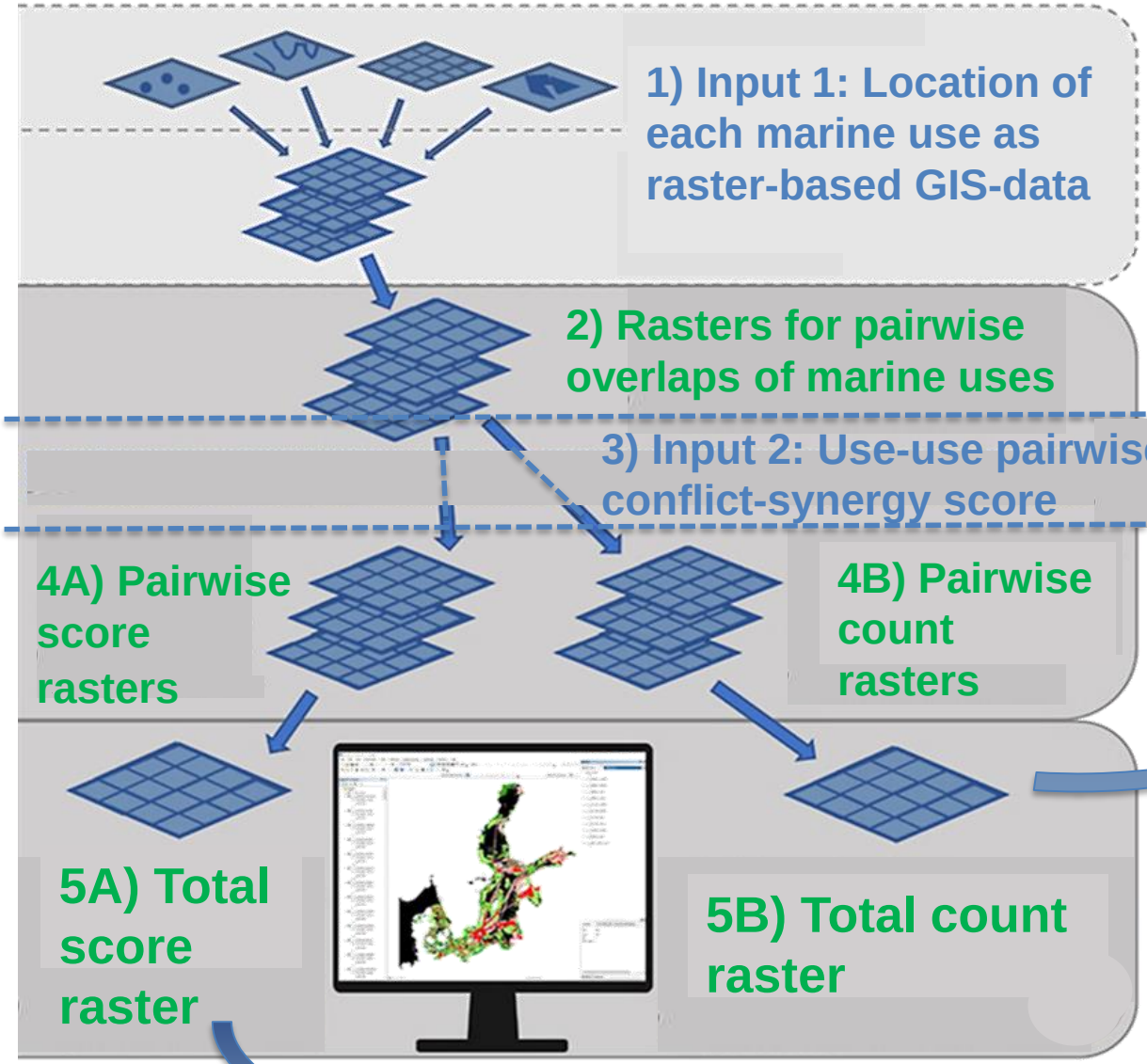

SEANERGY – a high degree of user flexibility

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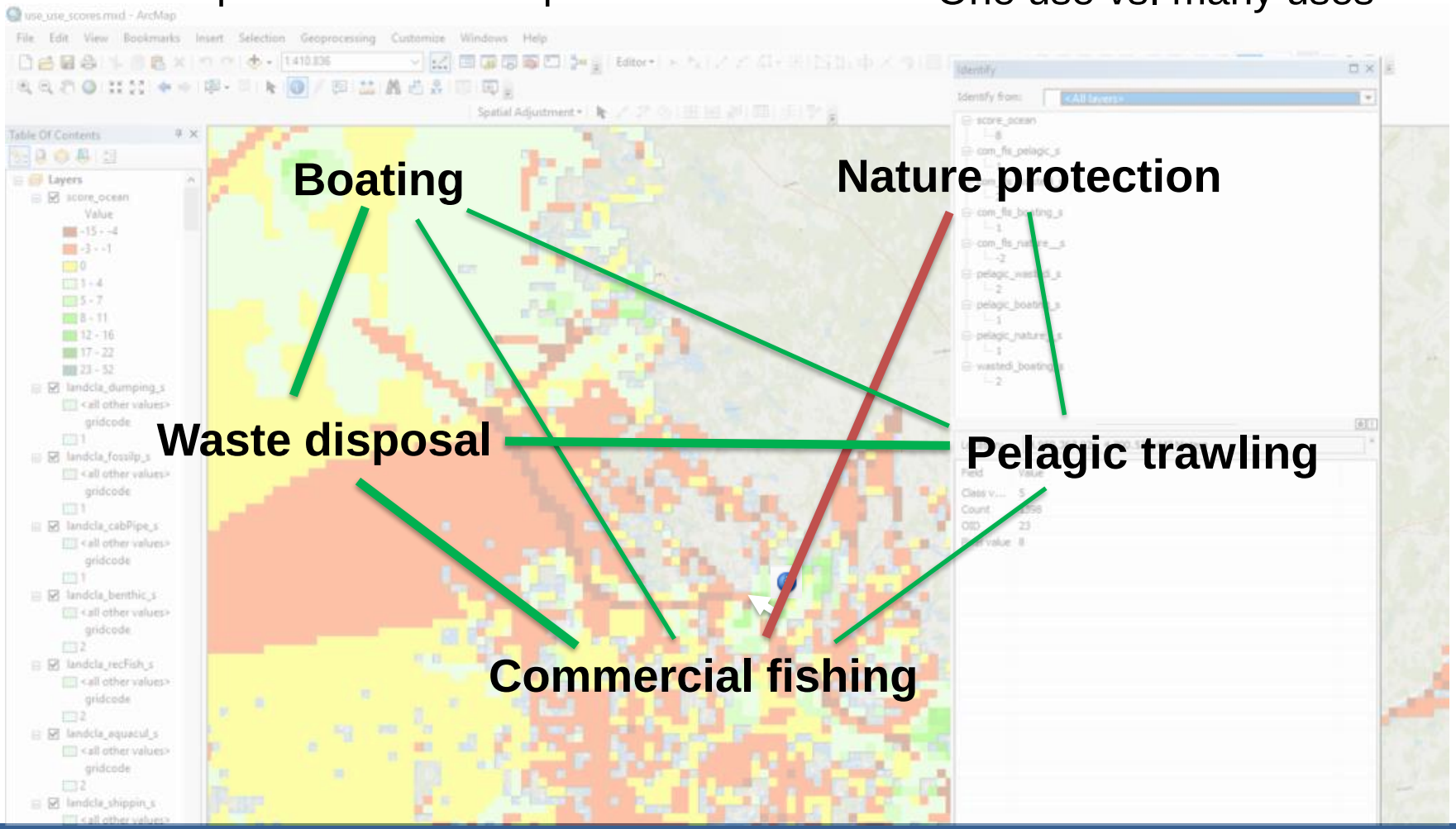
- Overall patterns vs. local patterns
- One use vs. many uses



Why use SEANERGY in short:

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- Maps to minimise conflicts
- Explore multi-use potentials

Users?

GIS scientists
in collaboration with
MSP researchers/practitioners

MSP practitioner facilitating discussions among stakeholders:
local planners/ citizens/ maritime sector representatives

- Implementing some of the methodology into MYTILUS
  - Faster run time, independent from ArcGIS
  - combine use-use interactions and use-environment interactions

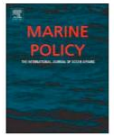
Articles about SEANERGY

Marine Policy 106 (2019) 103533

Contents lists available at ScienceDirect

Marine Policy

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



Assessing use-use interactions at sea: A theoretical framework for spatial decision support tools facilitating co-location in maritime spatial planning

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ARTICLE INFO

Keywords:
Co-location
Coexistence
Use-use interactions
Multi-use
Maritime spatial planning (MSP)
Spatial decision support tools (DSTs)
Geographical information systems (GIS)

ABSTRACT

The space occupied by traditional and ne
developing methods to assess interactio
However, no clear terminology for use-use
support tools (DSTs) to assess use-use int
found to either alone or together constitu
links, and user attraction links. It is found
by iteratively through the MSP process 1)
interactions, 2) list conflicts and synergie
synergies. With this analytical framework,
matrix- and ranking-based DSTs to detect
conflicts and optimise synergies. Whereas
latter group use information about which
thus the two groups of DSTs can advant
location framework and the DSTs. It is a
considering the spatial-temporal links of
prioritize ranking of synergies and conflic

[2019] Bonnevie, I.M. & Hansen, H.S. & Schrøder, L. Assessing use-use interactions at sea: A theoretical framework for spatial decision support tools facilitating co-location in maritime spatial planning. Marine Policy, Vol. 106, 103533, *10.1016/j.marpol.2019.103533*.

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[2020] Bonnevie, I.M. & Hansen, H.S. & Schrøder, L. SEANERGY - a spatial tool to facilitate the increase of synergies and to minimise conflicts between human uses at sea. Environmental Modelling & Software, Vol. 132, 104808, *10.1016/j.envsoft.2020.104808*.

Environmental Modelling and Software 132 (2020) 104808

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Environmental Modelling and Software

journal homepage: http://www.elsevier.com/locate/envsoft

SEANERGY - a spatial tool to facilitate the increase of synergies and to minimise conflicts between human uses at sea

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Maritime spatial planning (MSP)
Cumulative impact assessments (CIA)
Spatial decision support tools (DSTs)

ABSTRACT

With expanding human uses at sea, the objective of maritime spatial planning (MSP) to promote sustainable coexistence between marine uses becomes an increasingly challenging task. In order to assess coexistence options, both use-use interactions and use-environment interactions are important to explore. Tools for doing cumulative impact assessments (CIA) on the environment provide a means for spatially exploring environmental impacts. Finding inspiration in such ecosystem-based spatial use-environment approaches while drawing on pairwise marine use compatibility knowledge from existing literature, a spatial approach to model potential synergies and conflicts between marine uses through an expert-based scoring system is presented and implemented in SEANERGY, an ArcMap-based opensource toolbox. A test based on Baltic Sea GIS-data demonstrates how SEANERGY supplements CIA analyses with knowledge about potential use-use synergies, potential use-use conflicts, and their spatial extents, useful for optimising the use of marine space in MSP without putting too much cumulative pressure on the environment.

Baltic Sea synergy-conflict inputs

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Thank you!

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