PlanWise4Blue geoportal – visualization and practical applications (WP4)

Presenter: Robert Szava-Kovats

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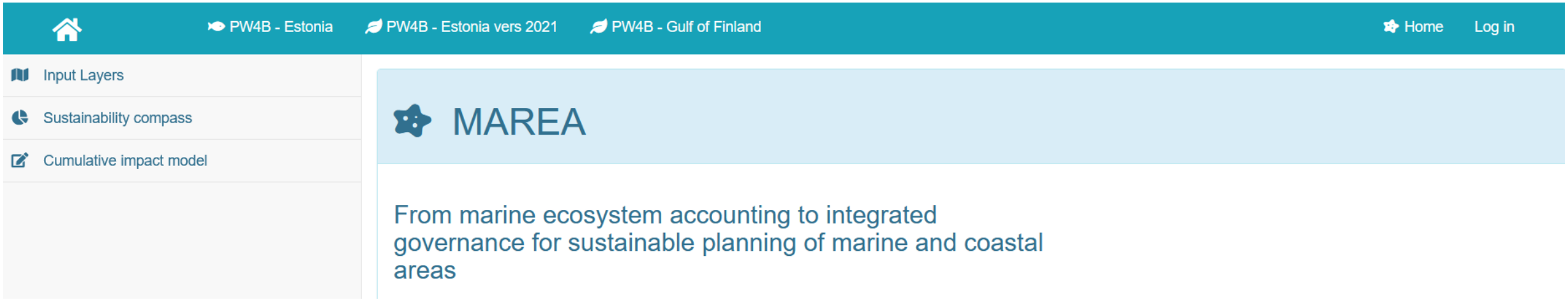
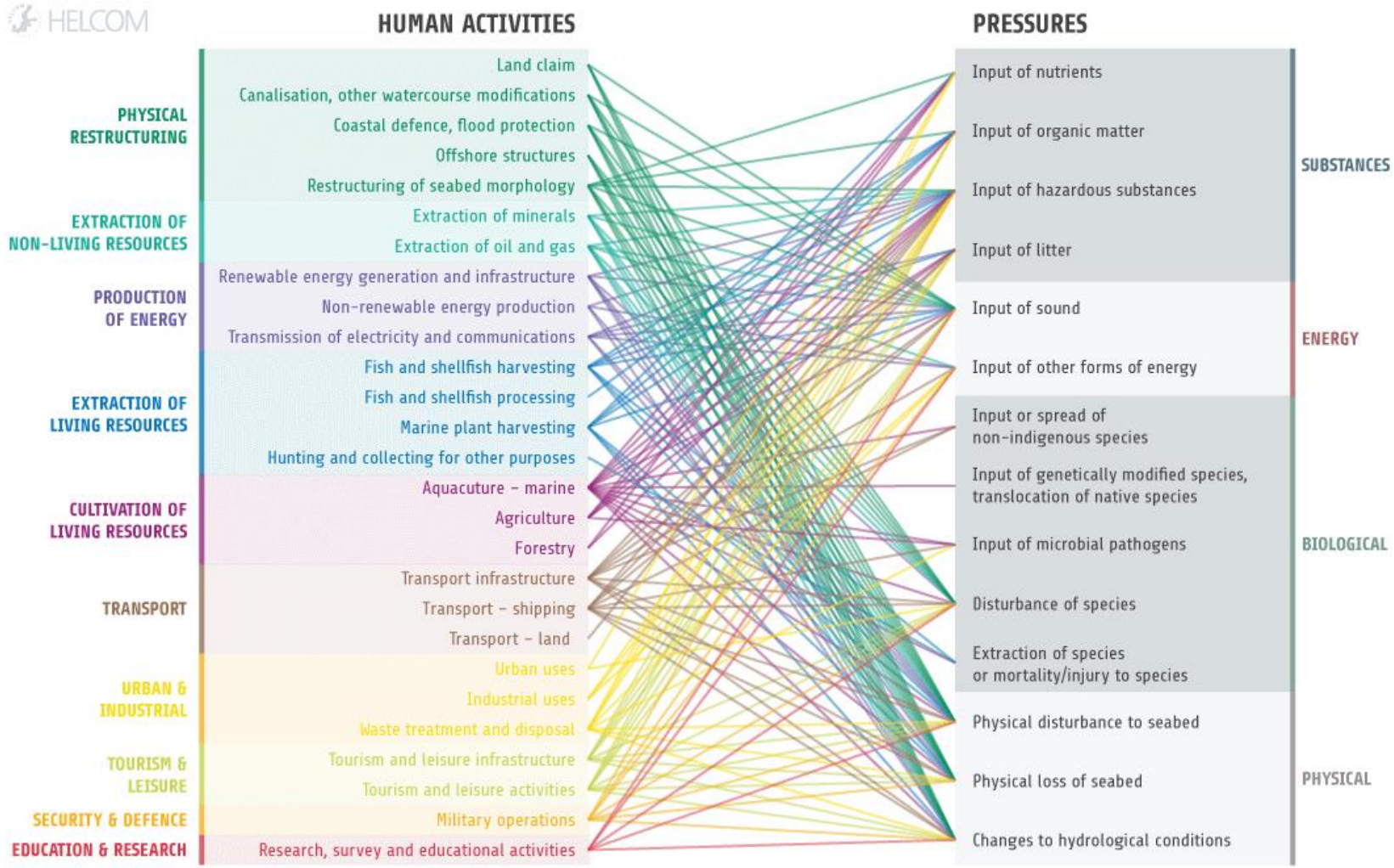
PlanWise4Blue geoportal

a) Cumulative impact assessment tool for ES
b) Sustainability compass
c) Environmental accounting



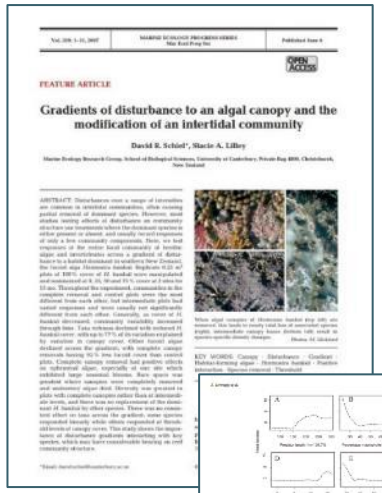
How to evaluate the combined impacts of human pressures on nature assets?

Marine ecosystems (the Baltic Sea is not the exception) are ***exposed to a diversifying and intensifying set of human pressures***, suffering in many cases irreversible changes



How to evaluate the combined impacts of human pressures on nature assets?

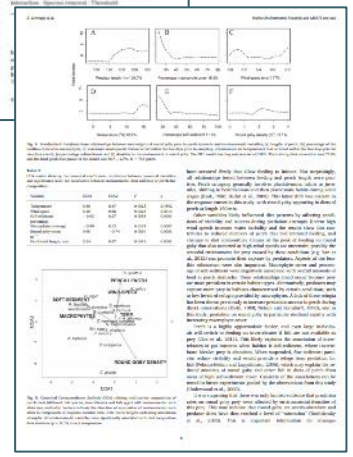
The ***multiplicity of pressures*** acting simultaneously on marine ecosystems ***require data and analysis demanding schemes***.



FEATURE ARTICLE

Gradients of disturbance to an algal canopy and the modification of an intertidal community

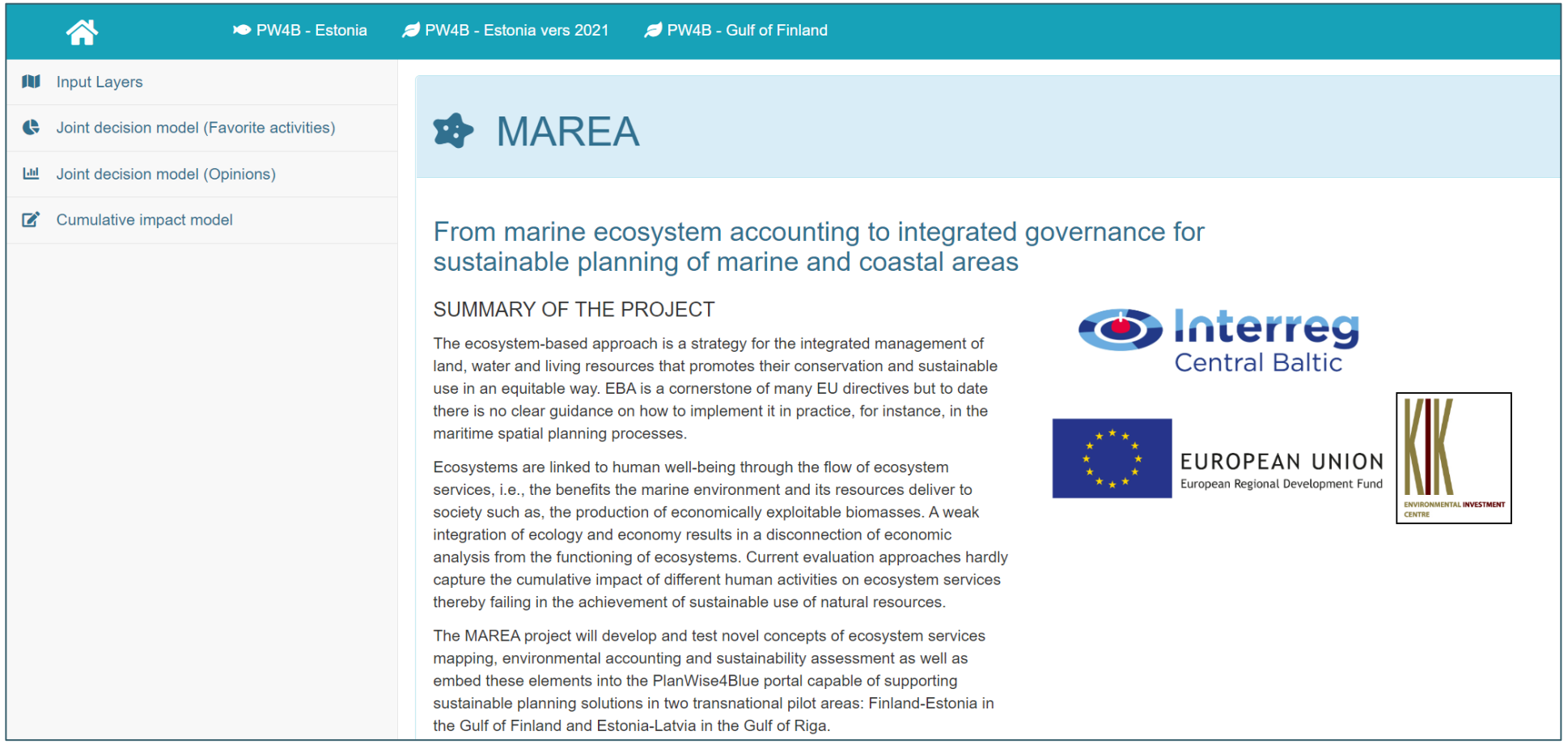
David R. Schiel*, Stacie A. Lilley



Disconnection in the flow of knowledge between science (specific/technical) ***and policy*** (general/layman approach).

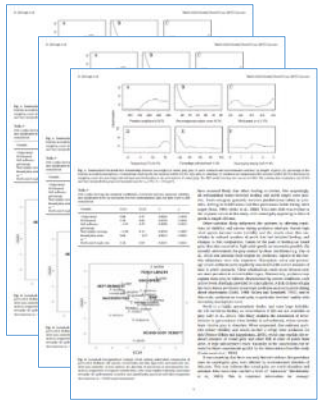
A promising solution: PlanWise4Blue

User-friendly online-based tool able to quantify the cumulative human impacts through the ***explicit incorporation of modelling and mapping advances of MAREA*** and previous projects and ***available empirical evidence of the effects of human pressures*** on nature assets.

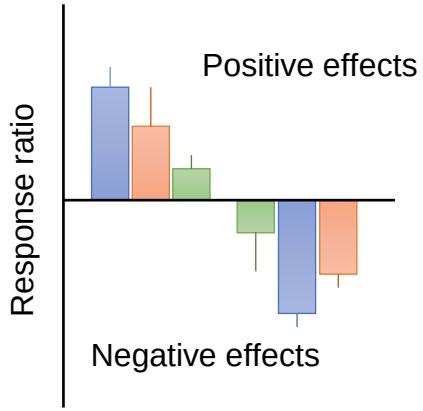


Behind the user-friendly interface…

Knowledge inventory



Extract data from relevant publications



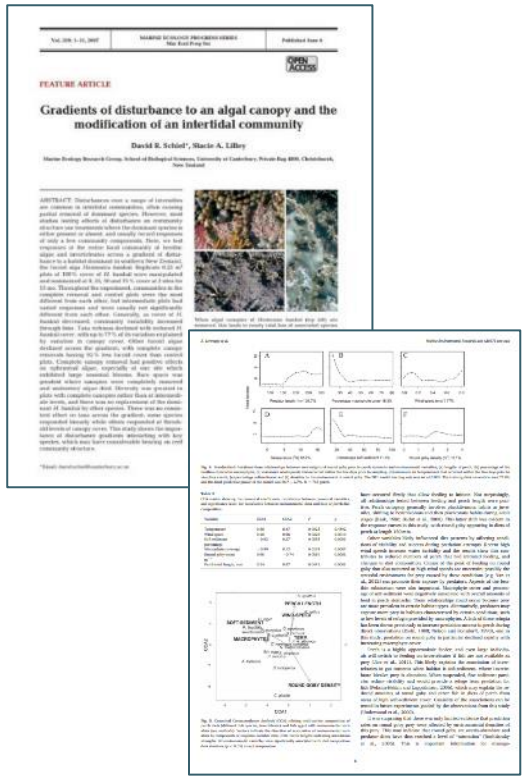
Meta-analyses and calculation of effect sizes

Nature value ID	env_layer_name	dredging	windpark	fish farming	shipping	underwater cable	commercial fishi	harbours
1	Bird - Benthos feeders	1	1	1	0.9	1	1	0.9
2	Bird - Fish feeders	0.75	1	0.9	0.9	1	0.9	0.9
3	Bird - Migration routes	1	0.75	1	0.9	1	1	1
4	Bird - Wintering areas	1	0.75	0.9	0.9	1	1	0.9
5	Bird - Herbivores	0.7	0.85	0.7	0.9	1	1	0.8
6	Fish - Herring spawning areas	0.75	1	0.9	1	1	1	0.9
7	Fish - Pikeperch spawning areas	0.75	0.9	0.9	1	1	1	0.9
8	Fish - Whitefish spawning areas	0.75	1	0.75	1	1	1	0.9
9	Habitat - Charophytes	0.5	1	0.5	1	0.9	1	0.75
10	Habitat - Fucus	0.9	1	0.9	1	1	1	0.9
11	Habitat - Furcellaria	0.75	1	0.75	1	1	1	0.9
12	Habitat - Higher plants	0.9	1	0.9	1	1	1	0.9
13	Habitat - Richness flora and fauna	0.5	1	0.9	1	1	1	0.9
14	Habitat - Suspension feeders	1	1.25	1	1	1	1	0.9
15	Habitat - Zostera	0.75	1	0.75	1	1	1	0.9
16	Seals - All species	0.9	0.75	0.9	0.9	1	0.9	0.9
17	HD - Sandbanks	0.66	1	0.76	1	0.98	1	0.86
18	HD - Mudflats and sandflats	0.63	1.06	0.89	1	1	1	0.9
19	HD - Reefs	0.79	1.06	0.89	1	1	1	0.9

Matrix of effects

The tool ***integrates current empirical evidence through meta-analysis to define the effects*** of human pressures on nature assets (including ecosystems services).

Data extraction from publications:



FEATURE ARTICLE

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Types of studies:

Field observations

Field manipulations

Laboratory experiments

Impact

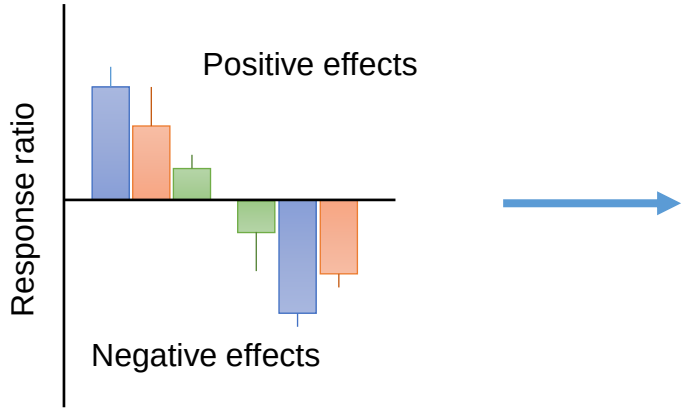
Control

Effect size (response ratio)
= Impact/Control

± Uncertainty*

* Sample size (more is better)

Meta-analysis (amalgamation of similar studies):



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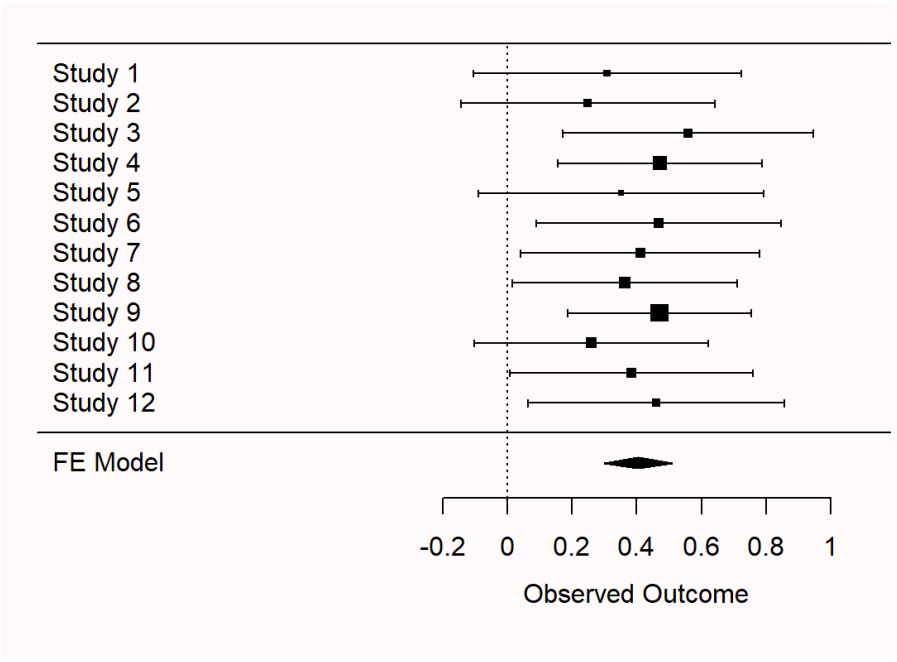


Number of studies (more is better)

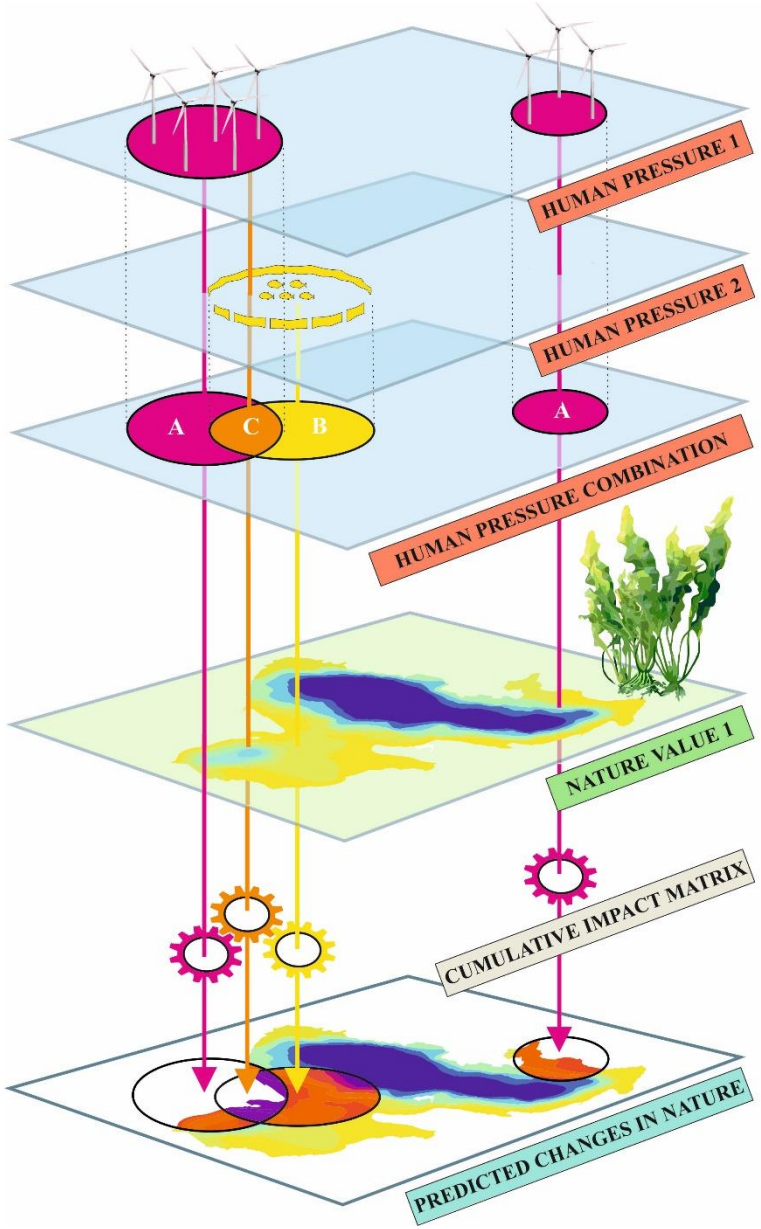
Purposes of uncertainty estimates:

1. Provides precision to assessment calculations (immediate)
2. Indicates research areas the deserve more attention (future)

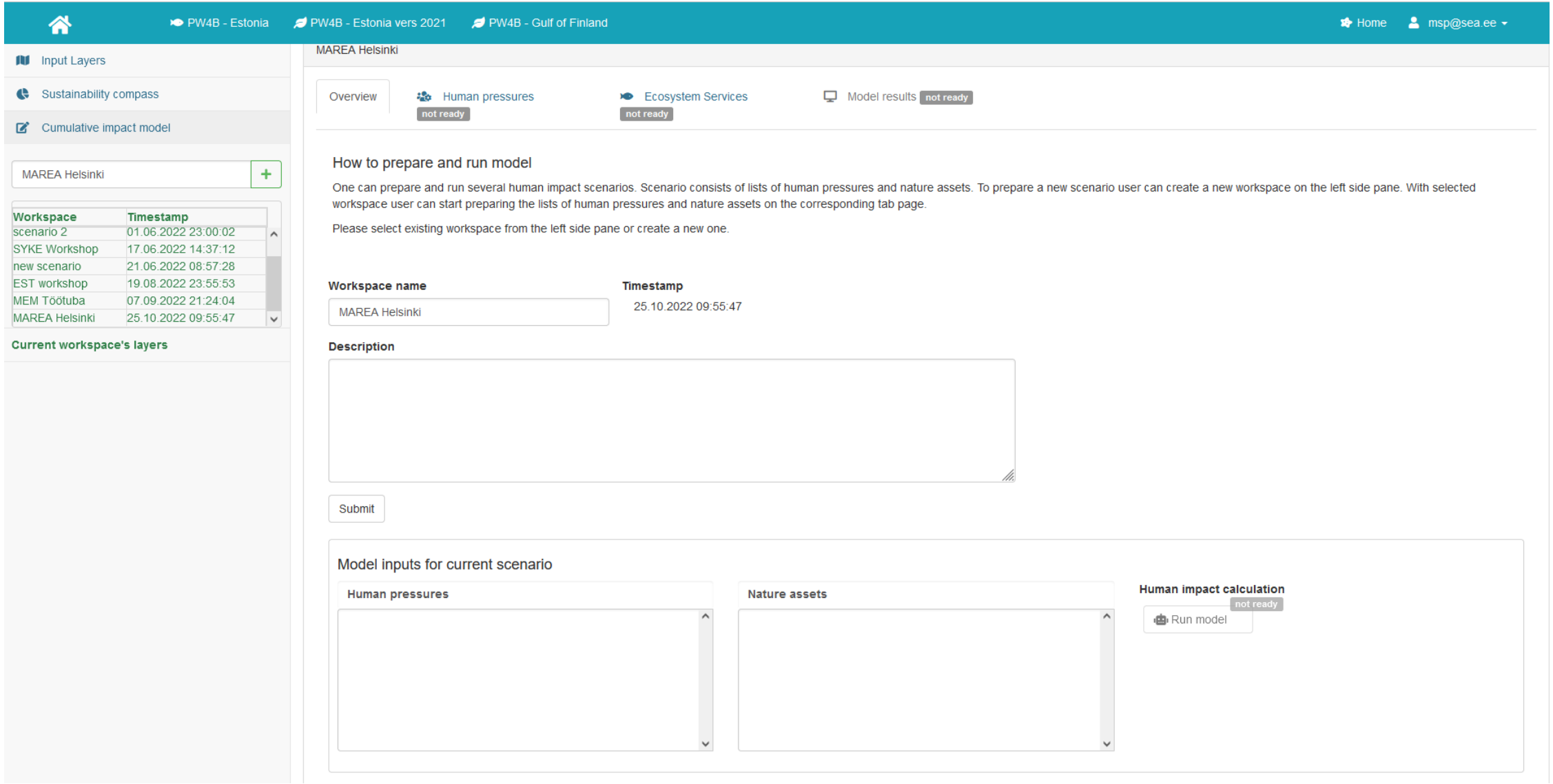
Behind the user-friendly interface…

Cumulative Impact Assessment

- ***Combines layers of nature asset values and human pressures*** (derived from project efforts and European data infrastructure).
- ***Incorporates evidence on how different human pressures affect different nature assets***.
- ***Quantifies in real-time the effects of these pressures*** at 1 km^2 scale based on the current best available data and knowledge.



Cumulative impact model



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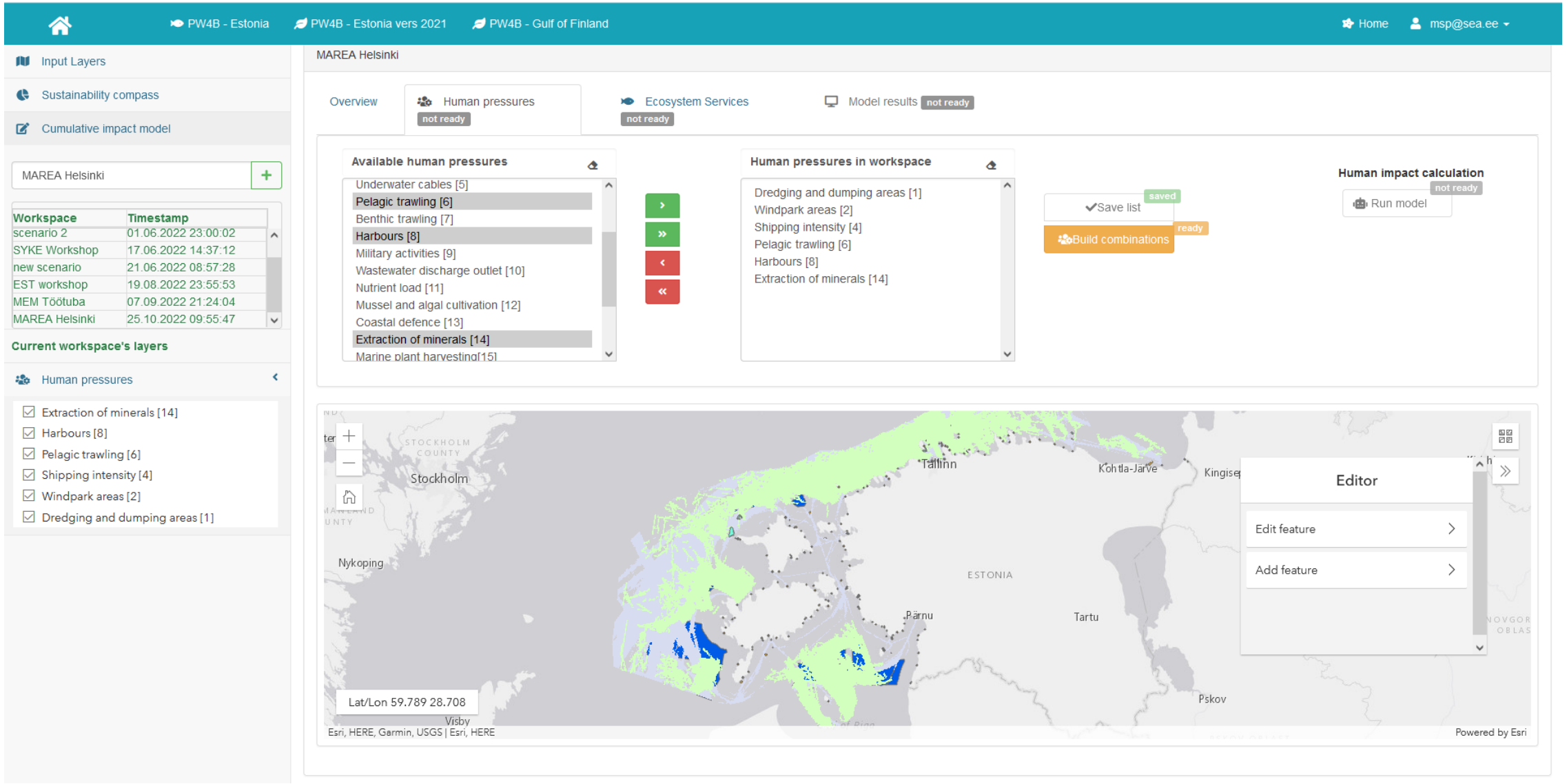

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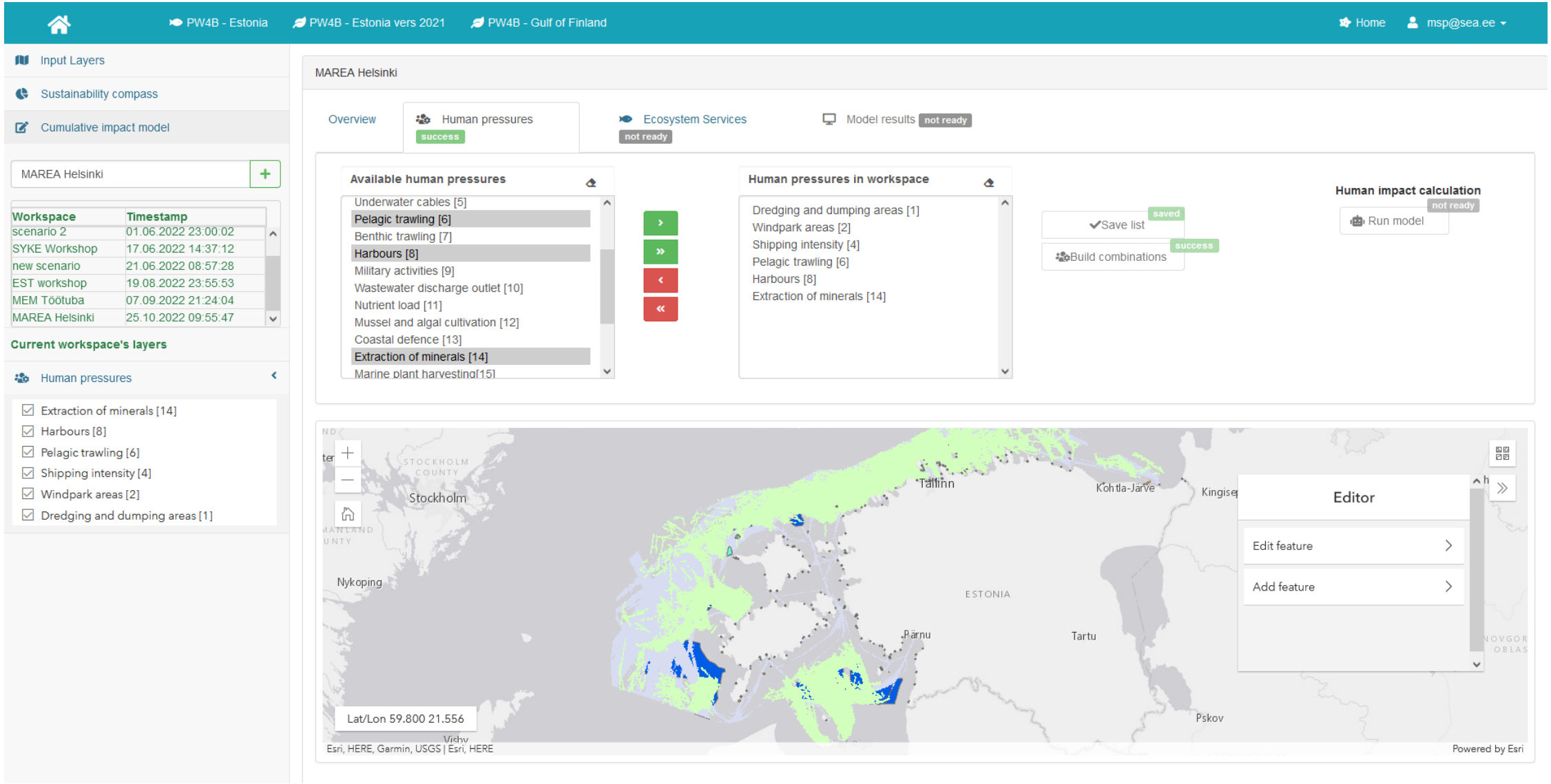

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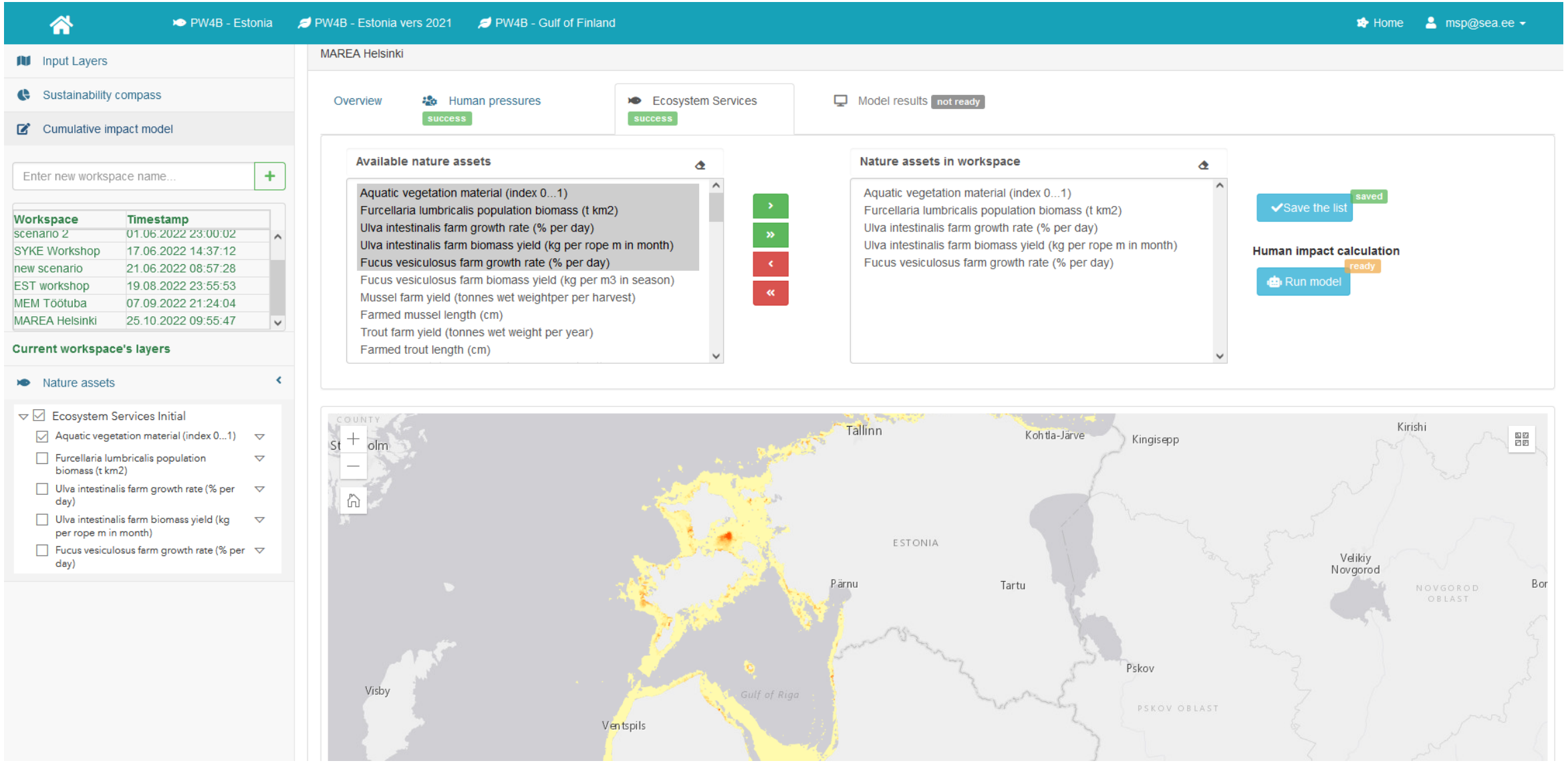

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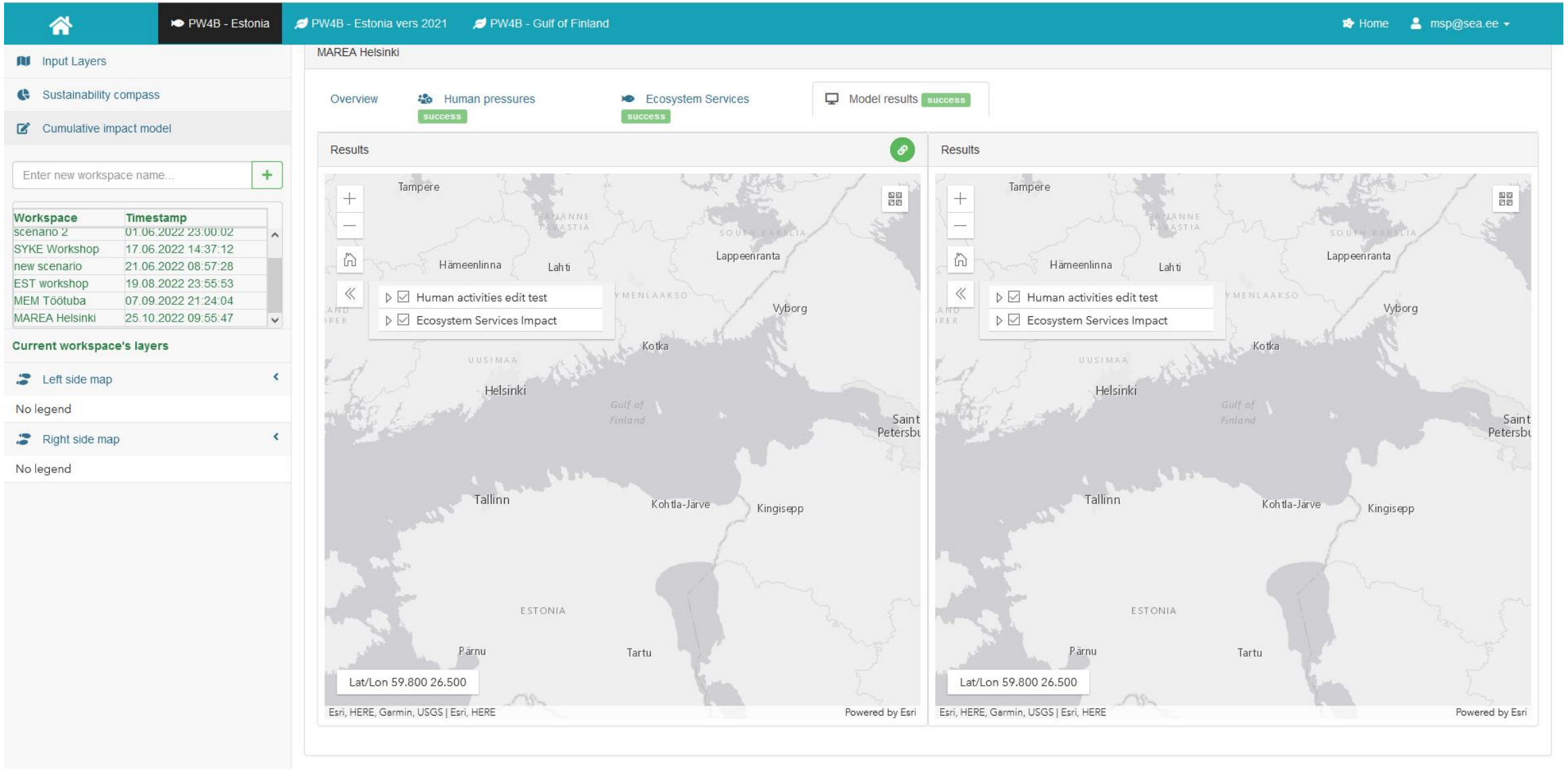

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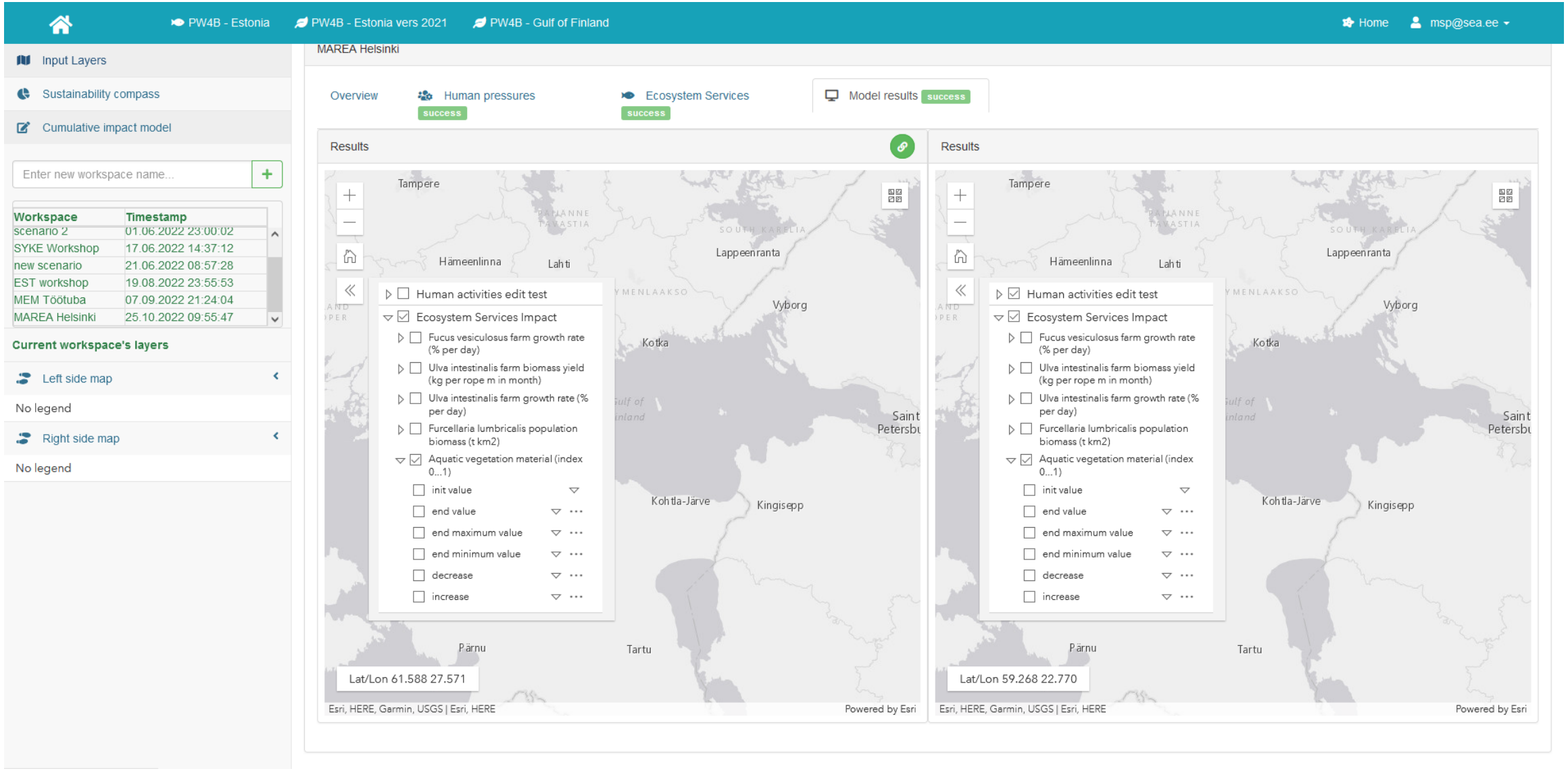

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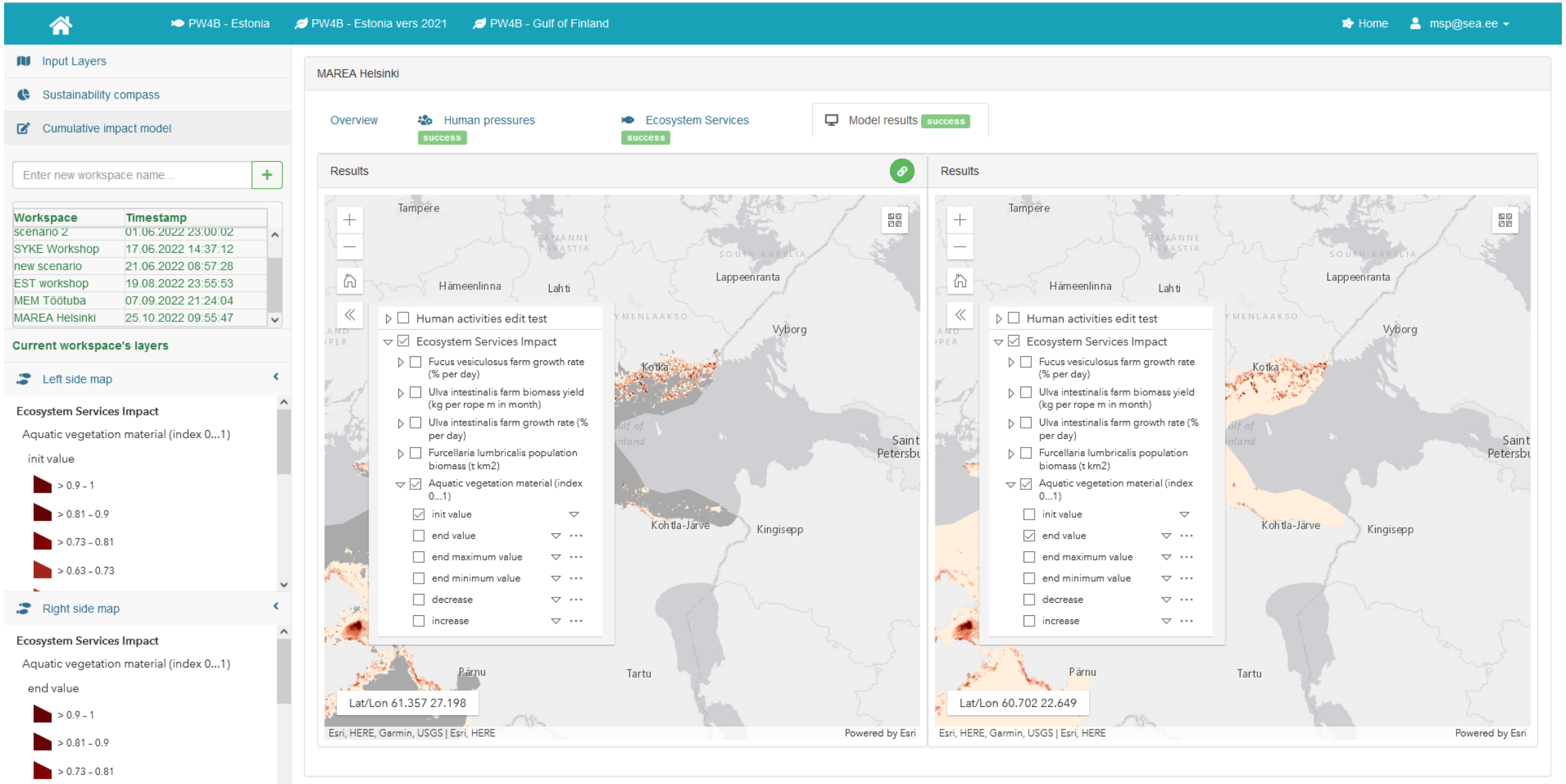

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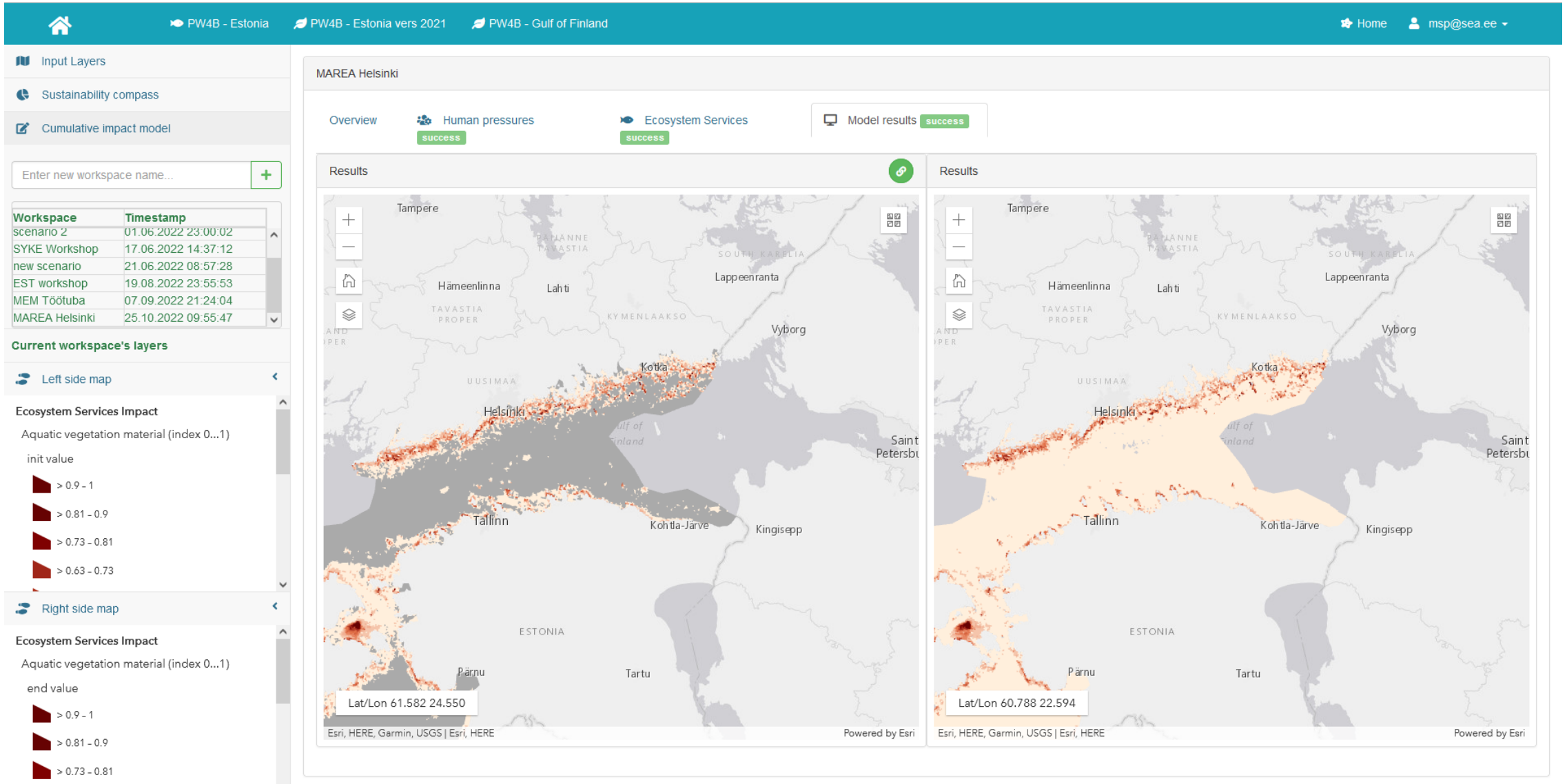

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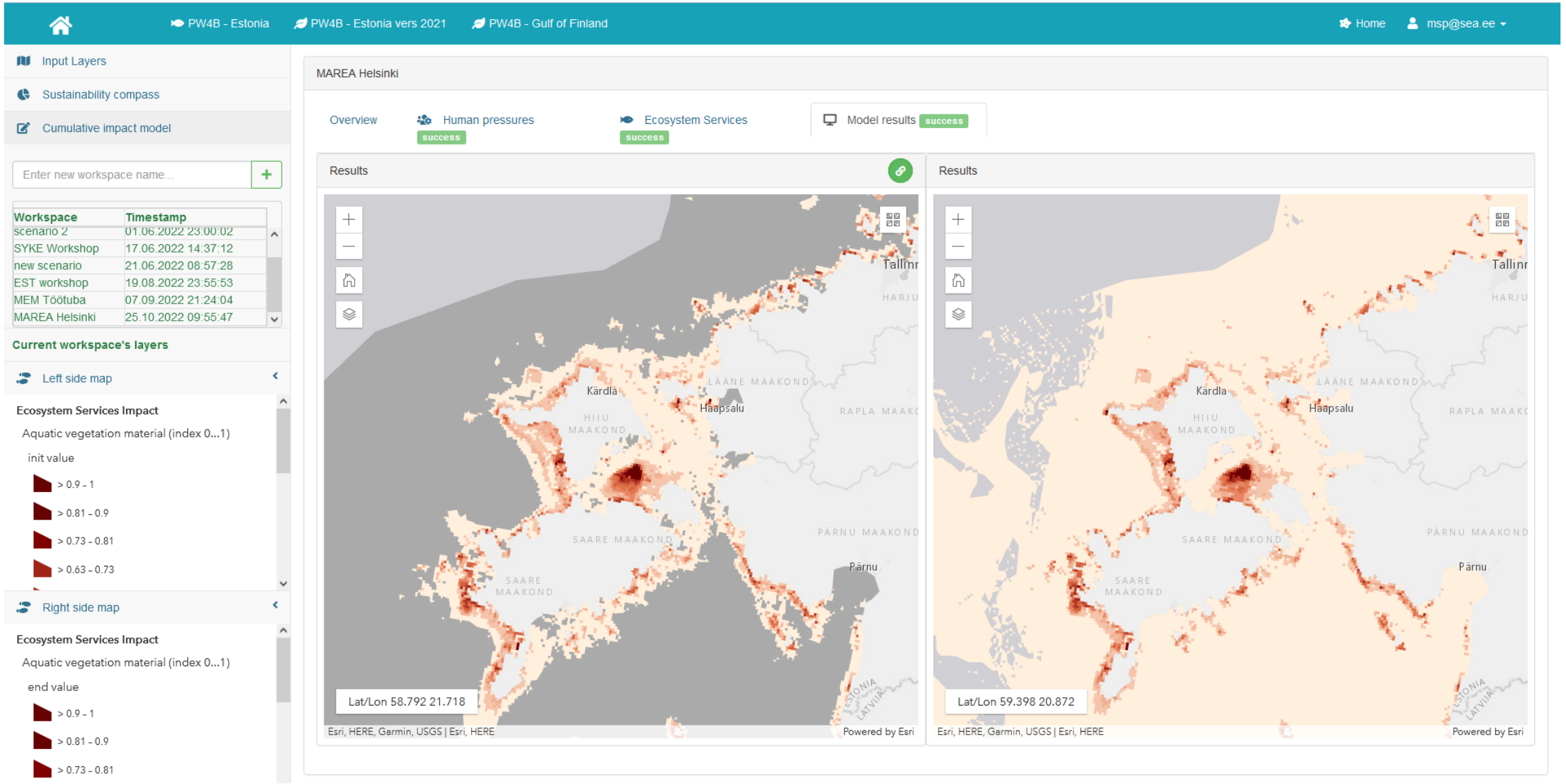
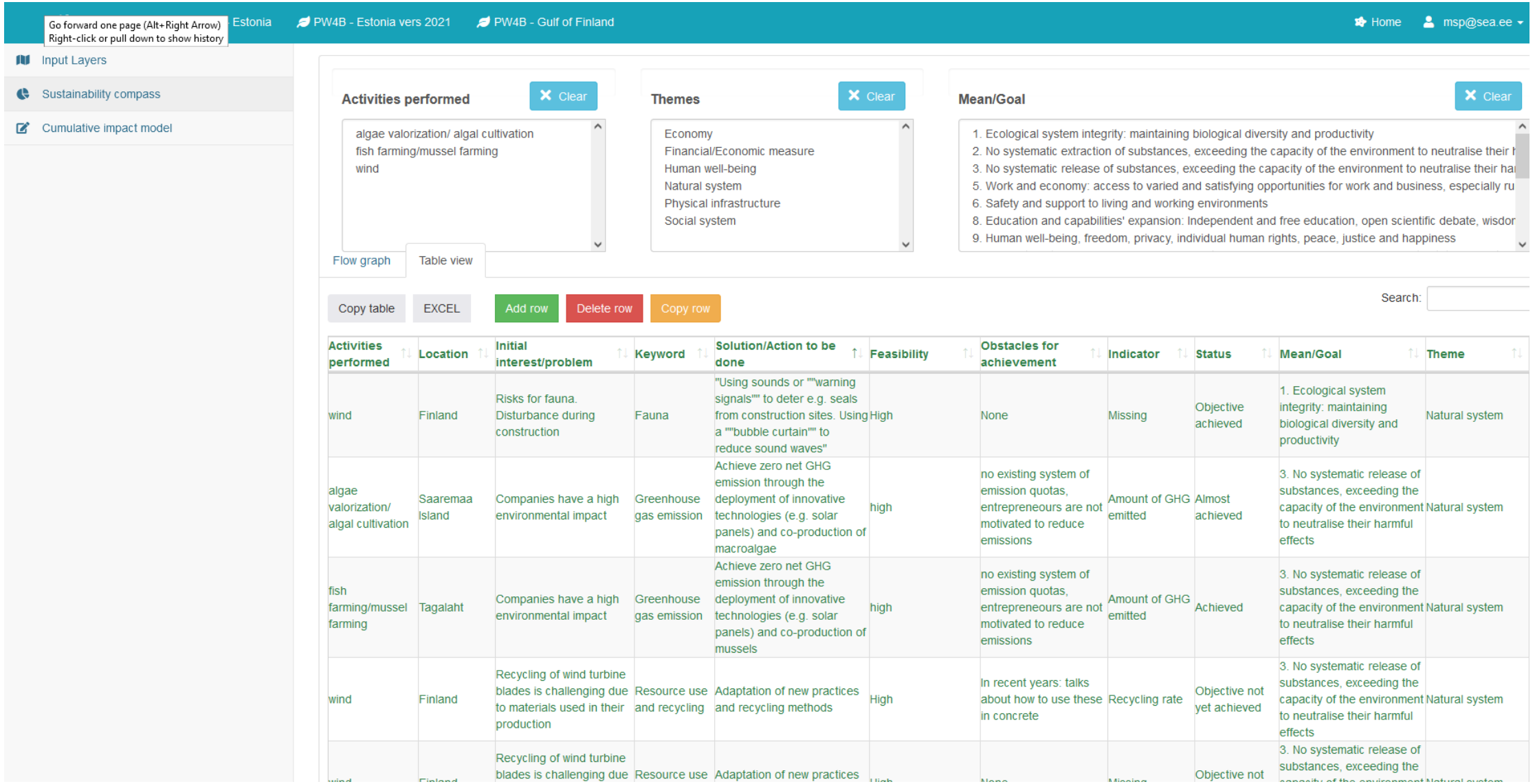
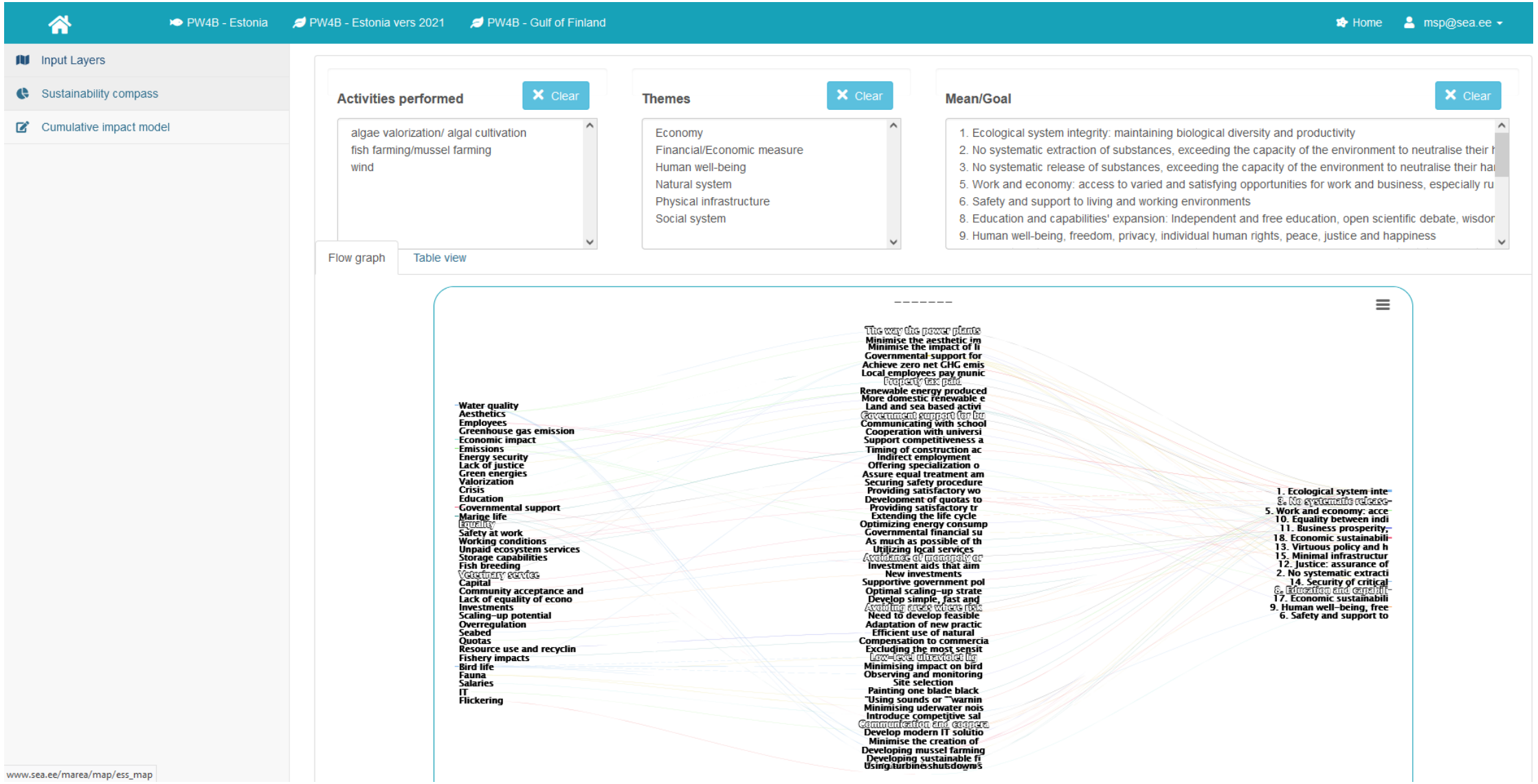


Sustainability compass



Activities performed	Location	Initial interest/problem	Keyword	Solution/Action to be done	Feasibility	Obstacles for achievement	Indicator	Status	Mean/Goal	Theme
wind	Finland	Risks for fauna. Disturbance during construction	Fauna	"Using sounds or ""warning signals"" to deter e.g. seals from construction sites. Using a ""bubble curtain"" to reduce sound waves"	High	None	Missing	Objective achieved	1. Ecological system integrity: maintaining biological diversity and productivity	Natural system
algae valorization/ algal cultivation	Saaremaa Island	Companies have a high environmental impact	Greenhouse gas emission	Achieve zero net GHG emission through the deployment of innovative technologies (e.g. solar panels) and co-production of macroalgae	high	no existing system of emission quotas, entrepreneours are not motivated to reduce emissions	Amount of GHG emitted	Almost achieved	3. No systematic release of substances, exceeding the capacity of the environment to neutralise their harmful effects	Natural system
fish farming/mussel farming	Tagalaht	Companies have a high environmental impact	Greenhouse gas emission	Achieve zero net GHG emission through the deployment of innovative technologies (e.g. solar panels) and co-production of mussels	high	no existing system of emission quotas, entrepreneours are not motivated to reduce emissions	Amount of GHG emitted	Achieved	3. No systematic release of substances, exceeding the capacity of the environment to neutralise their harmful effects	Natural system
wind	Finland	Recycling of wind turbine blades is challenging due to materials used in their production	Resource use and recycling	Adaptation of new practices and recycling methods	High	In recent years: talks about how to use these in concrete	Recycling rate	Objective not yet achieved	3. No systematic release of substances, exceeding the capacity of the environment to neutralise their harmful effects	Natural system
wind	Finland	Recycling of wind turbine blades is challenging due	Resource use	Adaptation of new practices	High	None	Missing	Objective not	3. No systematic release of substances, exceeding the	Natural system

Sustainability compass



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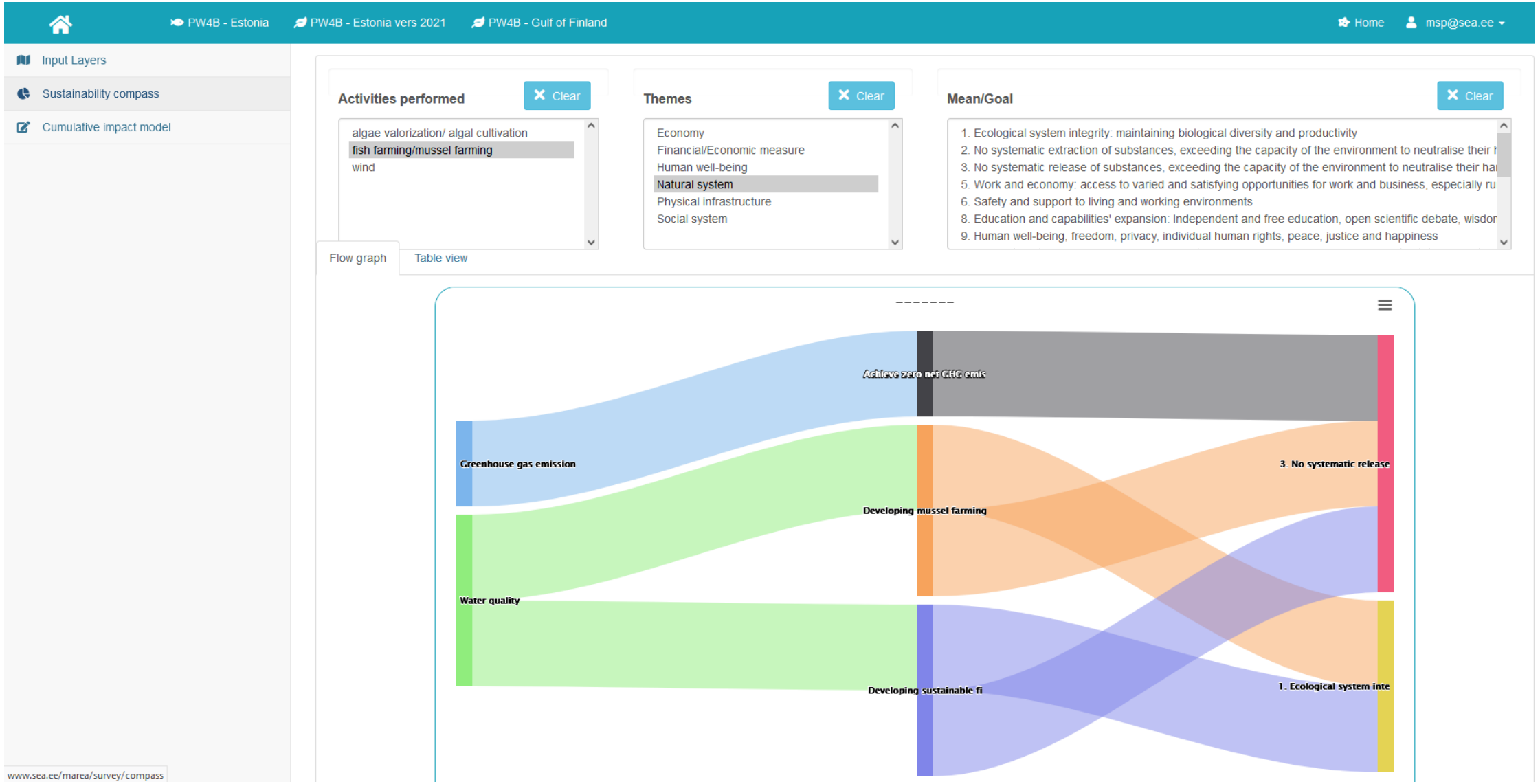

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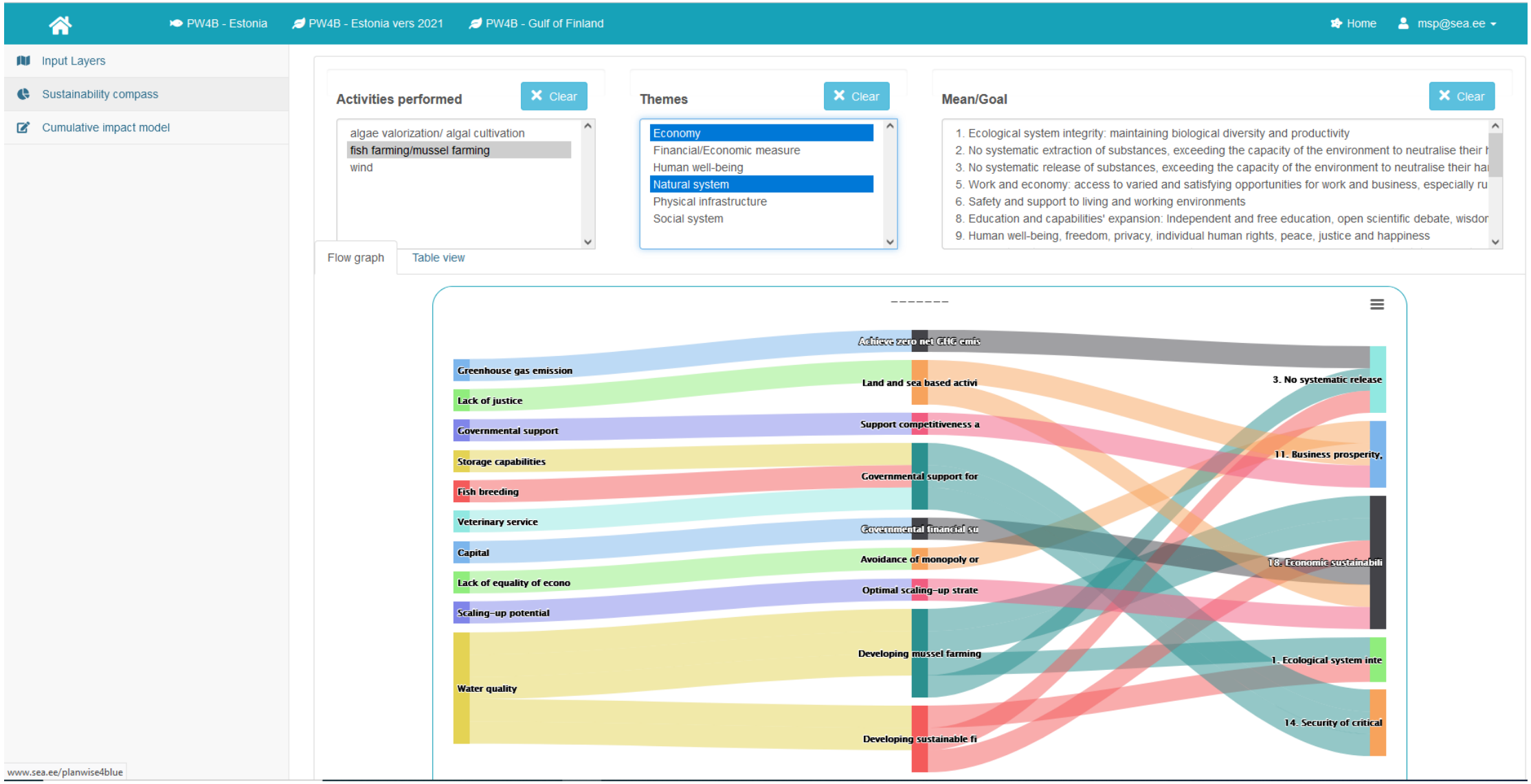

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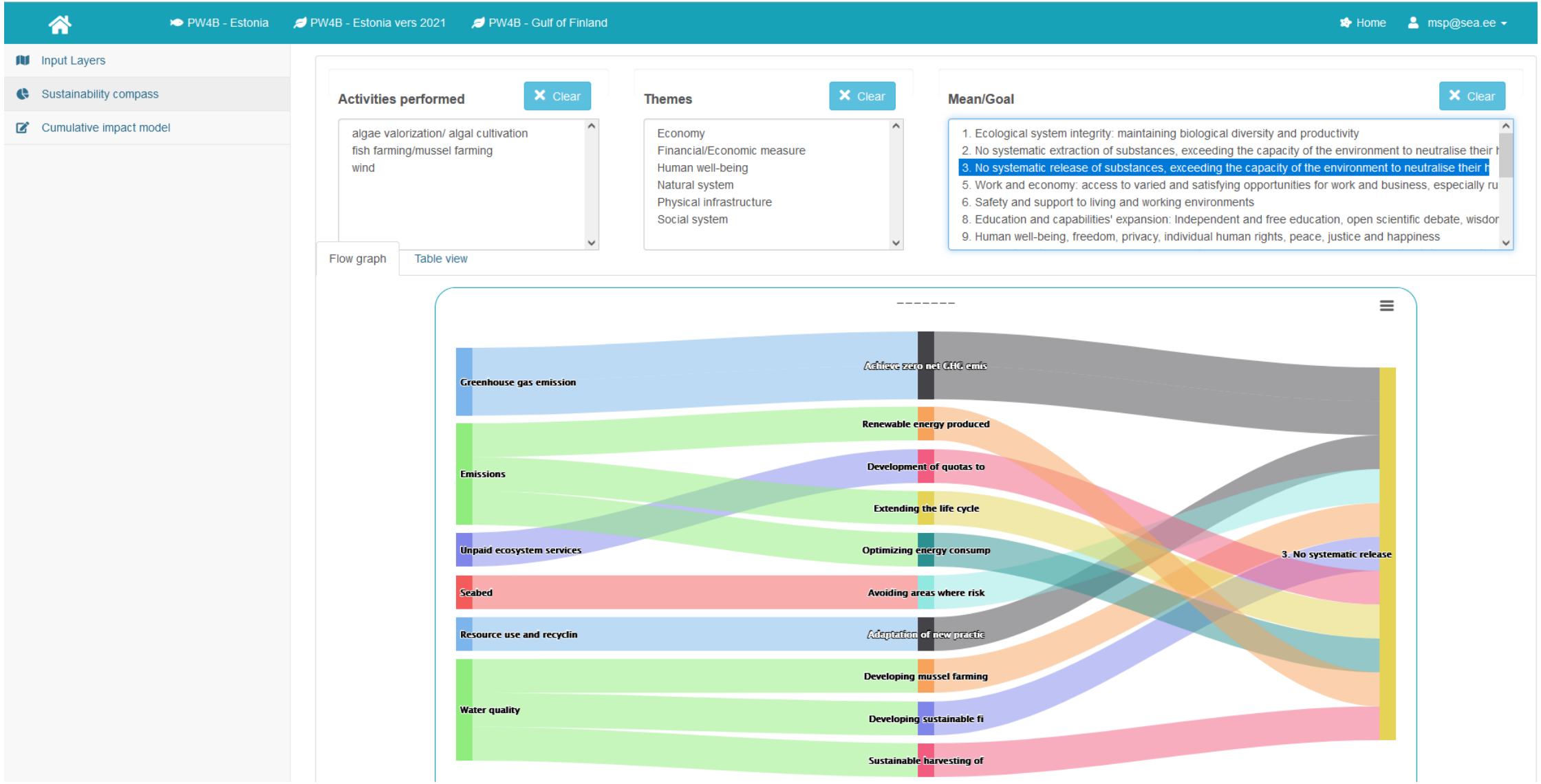
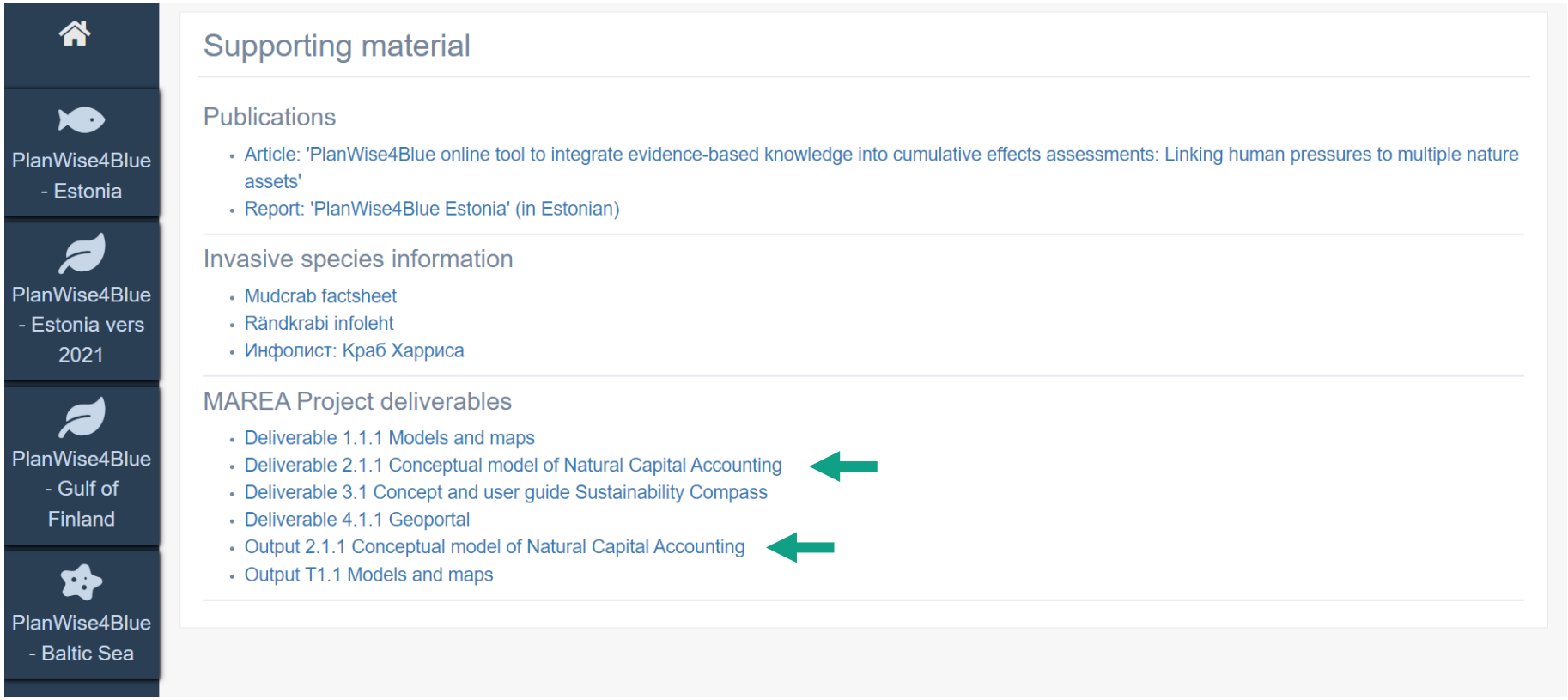


Environmental accounting

New modules based on state-of-the-art economic approaches are being implemented in PW4B for valuing the supply of relevant ecosystem services (e.g., mussel production under farming conditions, carbon sequestration and stock for *Zostera marina*).

For more information: http://www.sea.ee/planwise4blue/home/material



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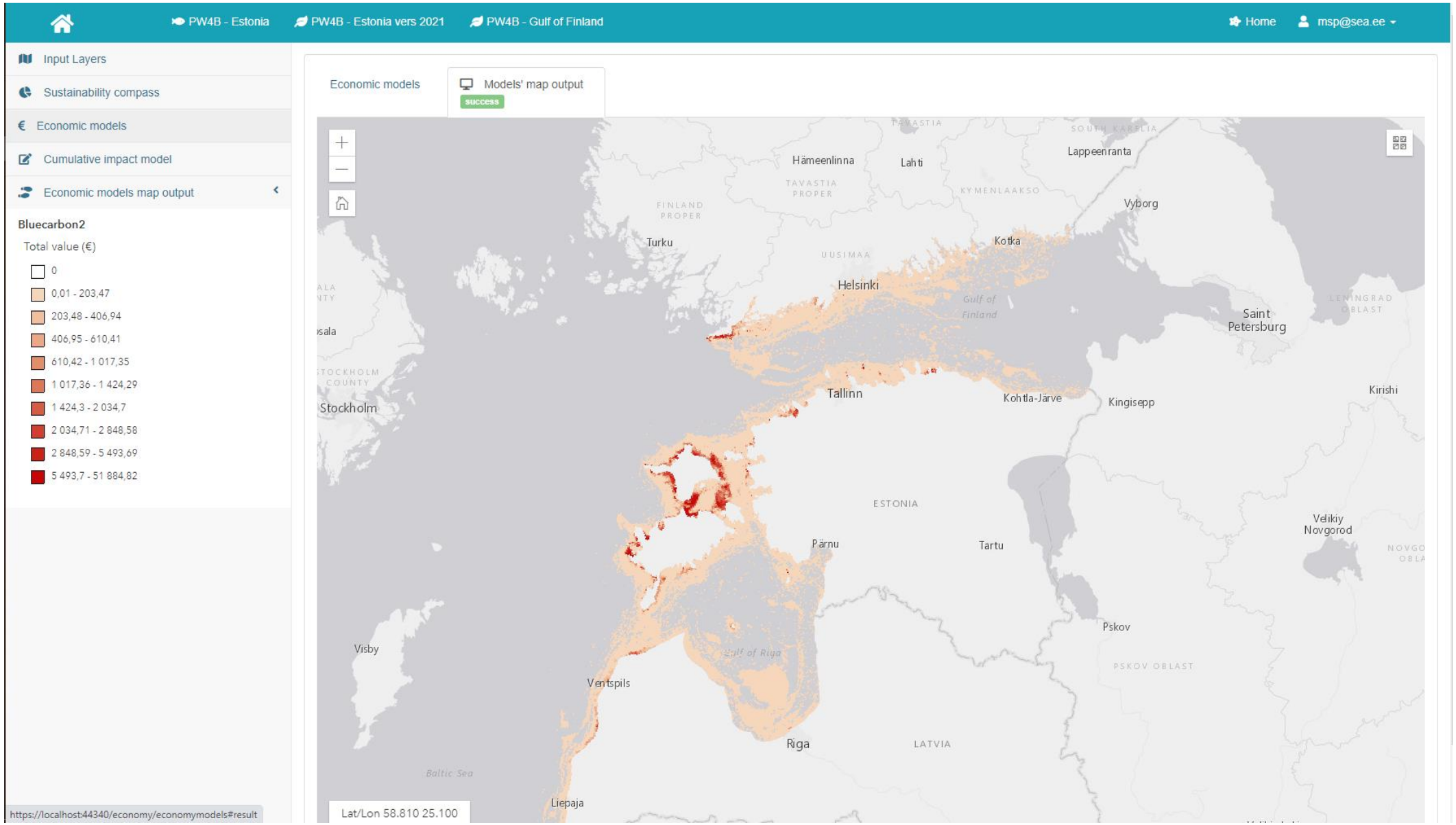

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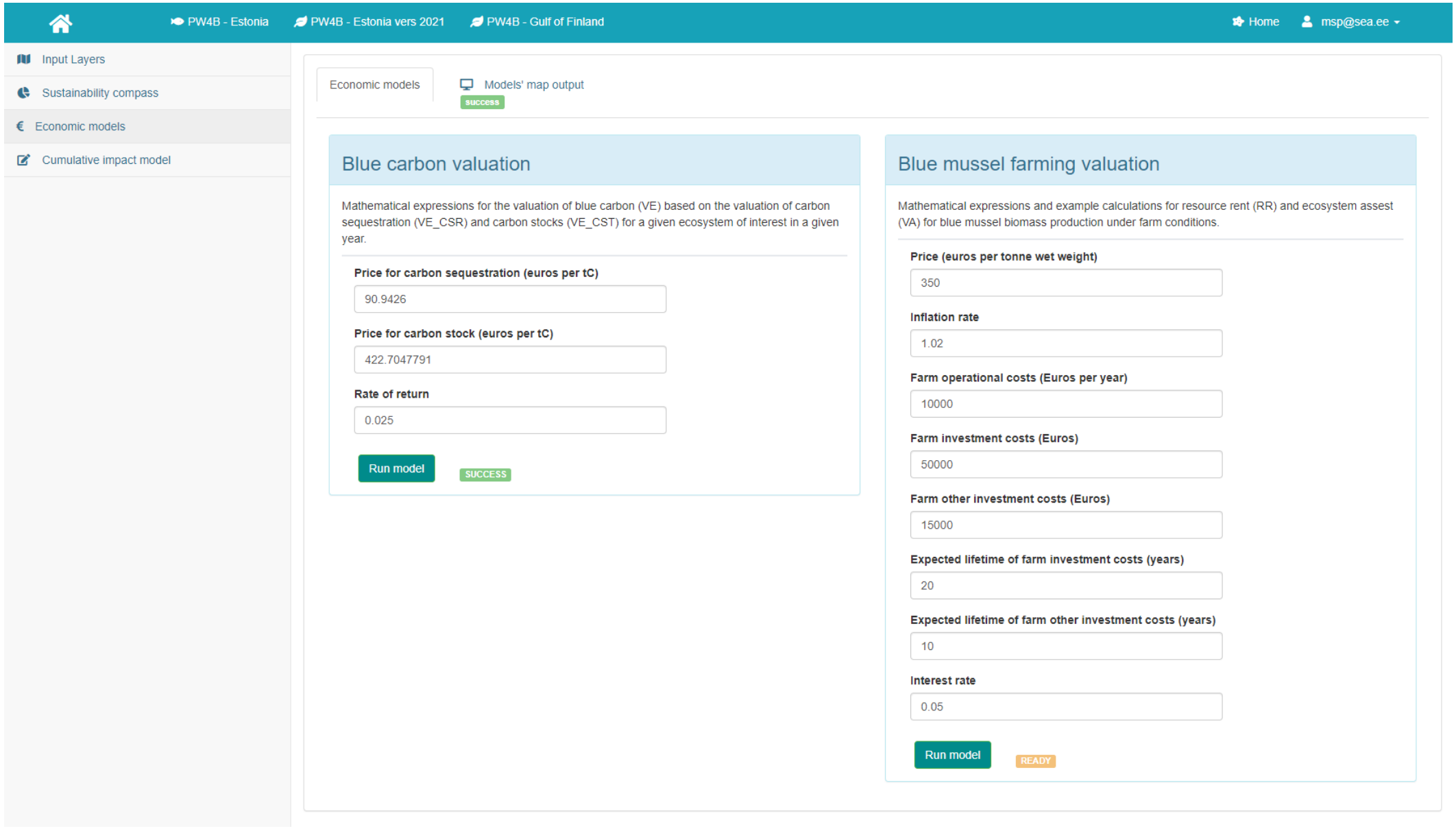

Thank you for your attention

Acknowledgements: *This study is supported by European Regional Development Fund, INTERREG Central Baltic project MAREA "From MARine Ecosystem Accounting to integrated governance for sustainable planning of marine and coastal areas" and the Estonian Environmental Investment Centre*