



CIA Tool presentation

Symphony

Jonas Pålsson

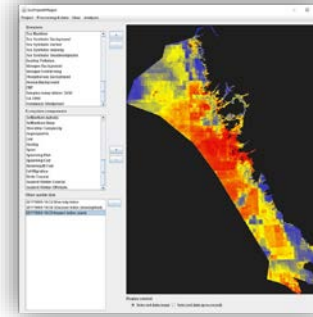
Swedish Agency for Marine and Water Management (SwAM)



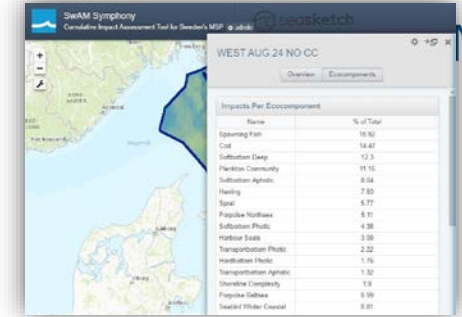
Introduction

- Developed for Marine Spatial Planning 2015
 - *Where are the marine activities?*
 - *Where are the nature values?*
 - *What is the environmental impact?*
 - *Data & method development*
- Pilot SeaSketch 2017
- Interim solution Medins 2018-2019
- In house development 2019-2020

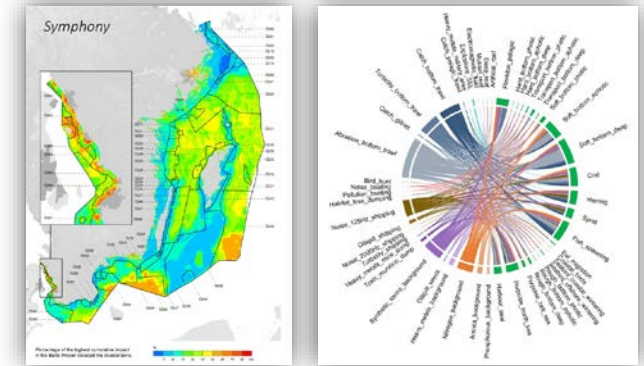
Impact Mapper



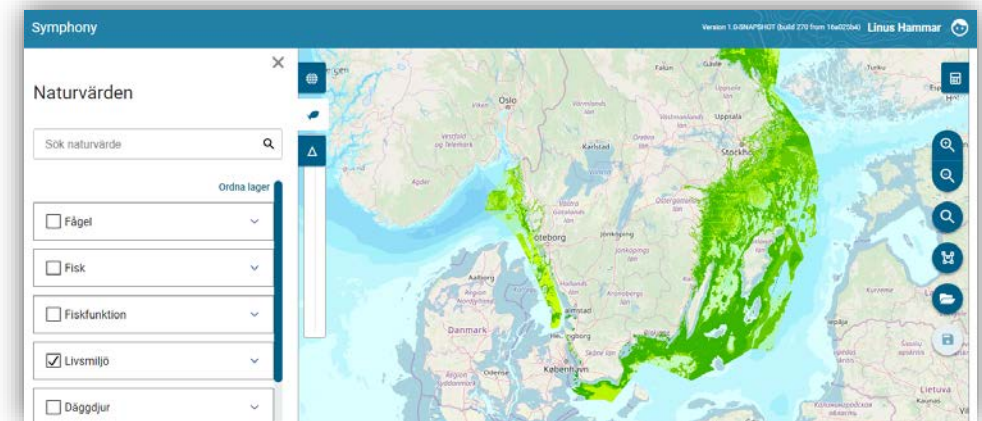
SeaSketch



Medins SyM

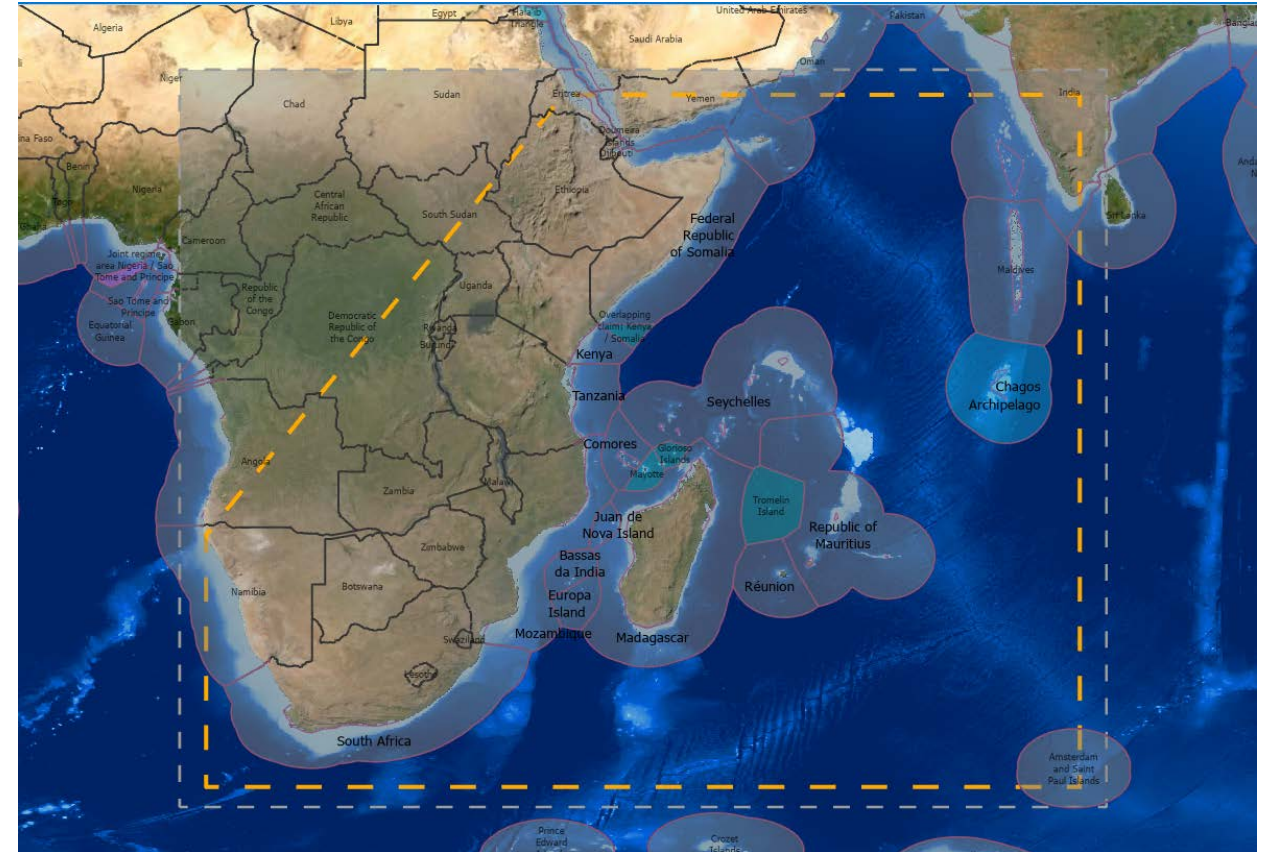


HaV Symphony



Uses

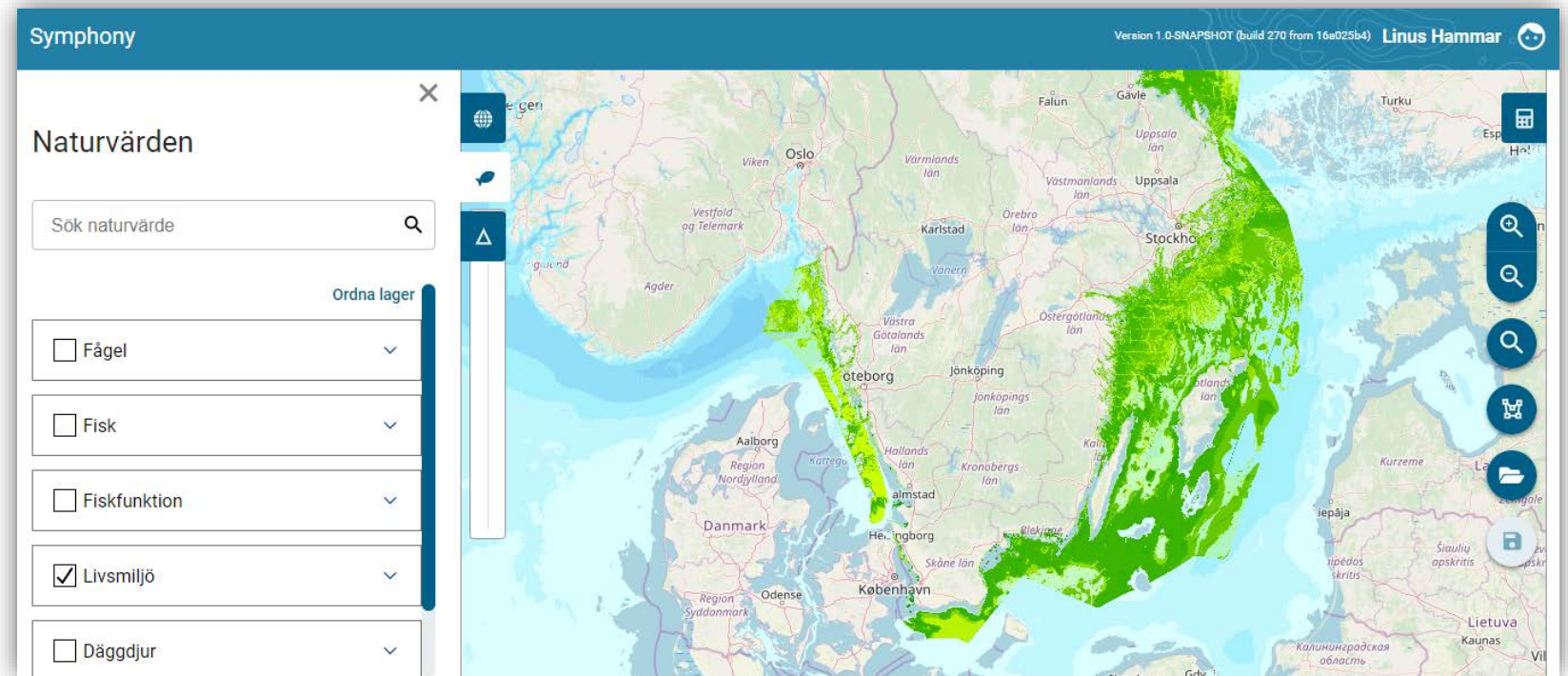
- MSP
 - Evaluation planning alternatives
 - Communication
 - SEA document
- SwAM Ocean
 - Nairobi convention - WIOSym
- Bilateral cooperation
 - South Africa
- UN Ocean conference 2021



Spatial scope

- Swedish seas
- Can be any geographic scope

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Input data

- What input data does the tool use?
 - Raster files - GeoTIFF
- How does the tool handle input data of varying quality and resolution?
 - Downsampled to Symphony grid (250 x 250m)
 - Data is normalised before input (only national datasets used)
 - Will develop this more through WIOSym



Resolution

- At what resolution are results provided?
 - Symphony grid (250 x 250m)
 - Continuous communication that underlying datasets are most likely low resolution

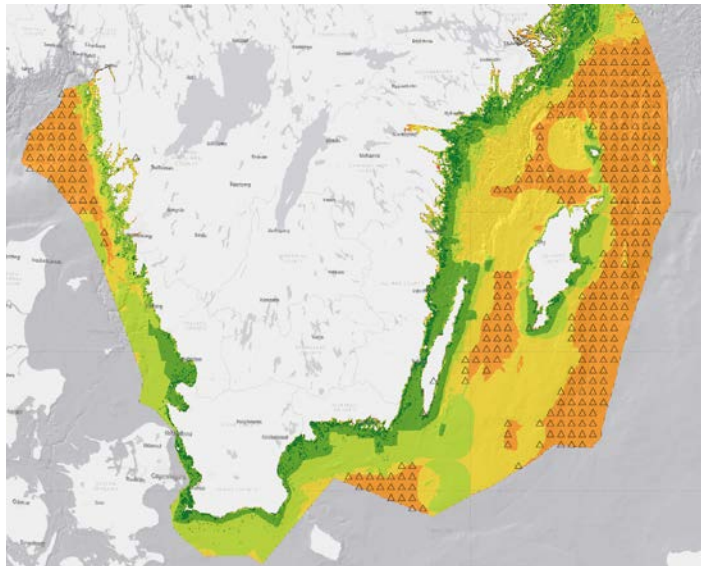


Confidence/uncertainties

- How is confidence assessed and presented?
 - Data availability maps

"Green map" data availability

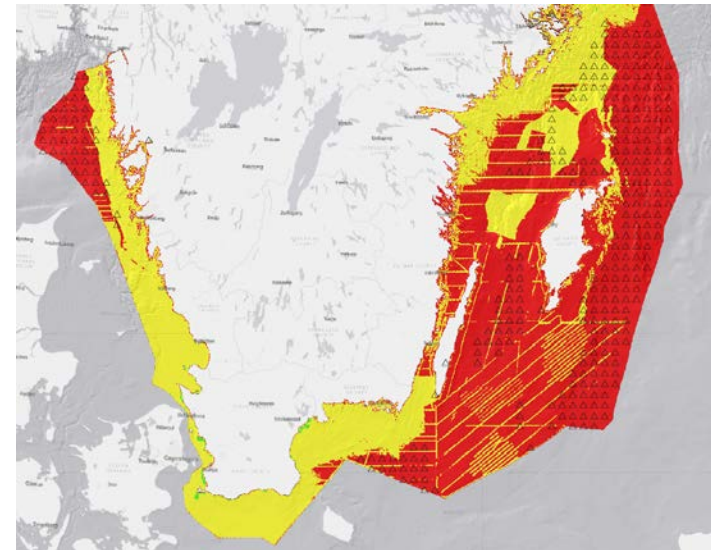
% layers with data (uncertainty layer > no data)



- How are uncertainties handled?
 - Uncertainty maps

"Green map" data uncertainty

Show combined uncertainty of models
(poor model – confirmed presence)



Calculation principle

- On which cumulative impact calculation principle is the tool based (e.g. Halpern et al. or some other method), can the approach be adjusted?
 - Halpern, simple addition (1+1+1+1...)
 - Can be adjusted



Platform

- On which platform does the tool run (separate software, ArcGIS toolbox, webtool..)
 - SwAM developed webtool (Java)
 - Can be packed and adjusted for offline use (South Africa, Moçambique)



Ownership

- Ownership of the tool. Can the tool be used for a public web based tool, i.e. is it open source or is it based on a commercial software?
 - SwAM owned (some form of CCBY-need to share modifications)
 - Yes, open source



Strengths (optional)

- What do you consider the main strengths of the tool?
 - Simple to use
 - No need to be a programmer or GIS expert
 - Published
(<https://www.sciencedirect.com/science/article/pii/S0048969720325419>)



Weaknesses (optional)

- What do you consider the main weaknesses of the tool?
 - Needs more development
 - Lack of updated data
 - Not easy to add new pressures/nature values
 - Method does not address foodweb interactions (ongoing research project to develop this)
 - Not currently open to public



Proportional values

- How can the tool, either now or as a result of further development (<1 year), account for presenting proportional values of impact for different pressures?
 - It already does, graph or numbers. Based on sensitivity matrix question on environmental effect, not on pressure intensity.
- How can the tool, either now or as a result of further development (<1 year) link proportional impact back to the source activity?
 - It already does, graph or numbers. Pressures are grouped into activities.



Indirect and direct pressures

- Does the tool already, or can it as a result of further development (< 1 year), differentiate between direct and indirect pressures?
 - Nope, only direct effects included at the moment.
 - Indirect pressures are even harder to validate.
- Can this information be spatially presented?
 - Not applicable



Scalable spatial presentation

- Can the tool support a scalable spatial presentation? E.g. acknowledging different possible pressures at various resolution.
 - Not sure exactly what is meant here.
 - All pressures are present regardless of resolution.
 - But you can choose to exclude whichever pressure you want in any calculation.



Pressure-effect response

- Could the tool accommodate/incorporate non-linear pressure-effect responses?
 - With work, yes.
 - However, the calculations would become much more complex and next to impossible to verify.



Aggregations and constellation analyses

- Can the tool in its current format, or with further development (<1 year) support a dynamic assessment approach? E.g. assessment can be done for varying subsets of activity/pressure/component combinations.
 - It already does.



Uses for ecosystem based management (EBM)

- What potential concrete management uses (in addition to the current uses already listed in the presentation) do you foresee the tool could support in its current form/with further development?
 - Scenario building, testing the impact of various management options to find the most cost-effective measure.



Climate change

- Does the tool already incorporate climate change in any way? Do you foresee how climate change might be included as part of future development?
 - Climate change as pressure layers.
 - 2 at the moment (for 2050)
 - Ocean acidification
 - Temperature
 - 5 more layers ready (RCP 4.5 and 8.5 for 2085)
 - Surface & bottom temperature
 - Surface & bottom salinity
 - Ice cover
 - Baltic wide, and will be shared with you as soon as we get metadata and distribution paperwork ready



Forecasting/projections

- Could the tool incorporate some form of forecasting? If yes, how could the tool handle forecasting?
 - It already does. You can manually change the intensity of any pressure or ecosystem component +/- 100%, or add a fixed value.
 - Results will be mathematically strange if this takes the intensity above the maximum value in the area.



Thank you!

jonas.palsson@havochvatten.se

<https://www.havochvatten.se/en/eu-and-international/marine-spatial-planning/symphony---a-tool-for-ecosystem-based-marine-spatial-planning.html>

