Seamless biodiversity maps in the northern Bothnian Bay

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Finnish Environment Institute

SEAmBOTH final seminar

Oulu

20.02.2020

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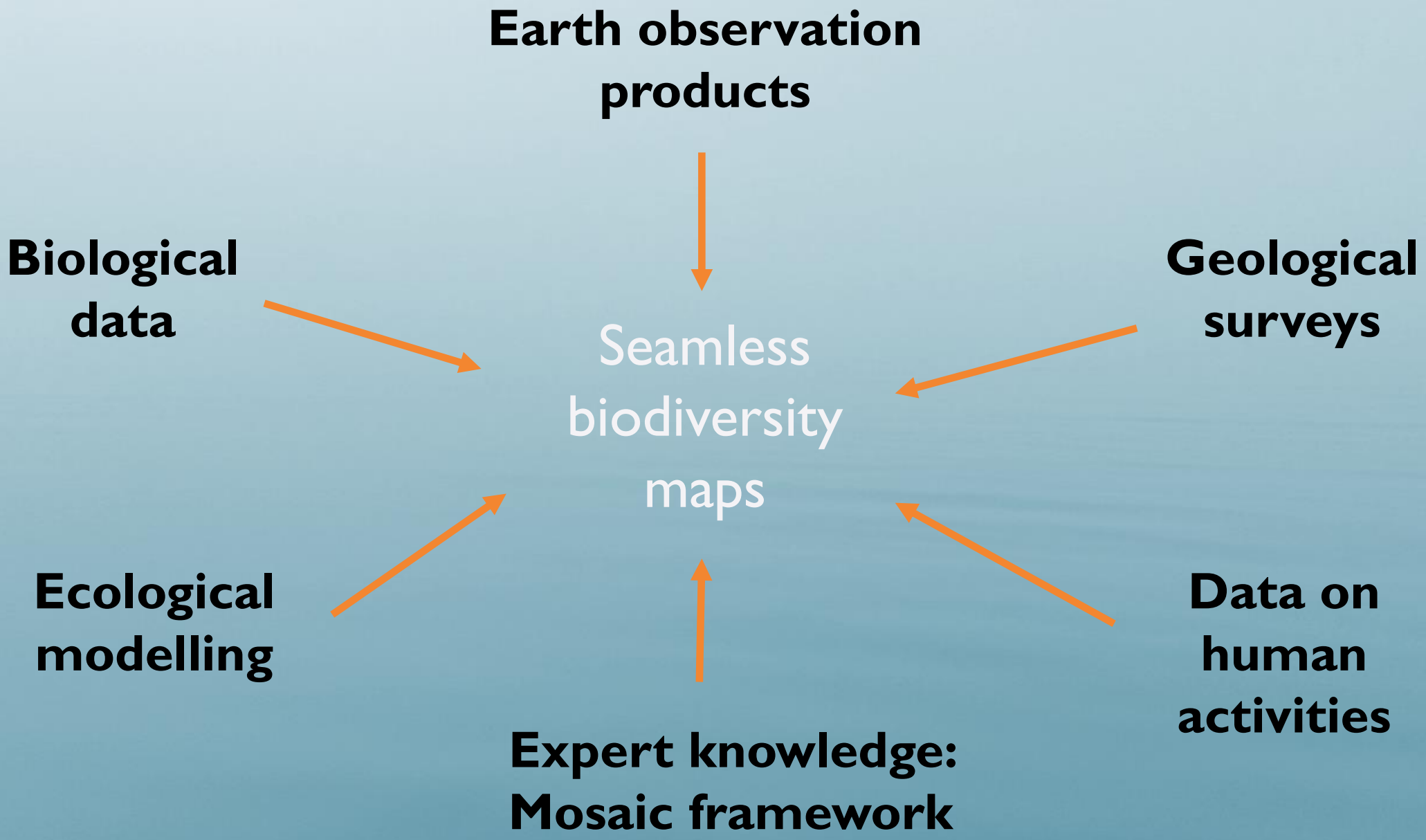
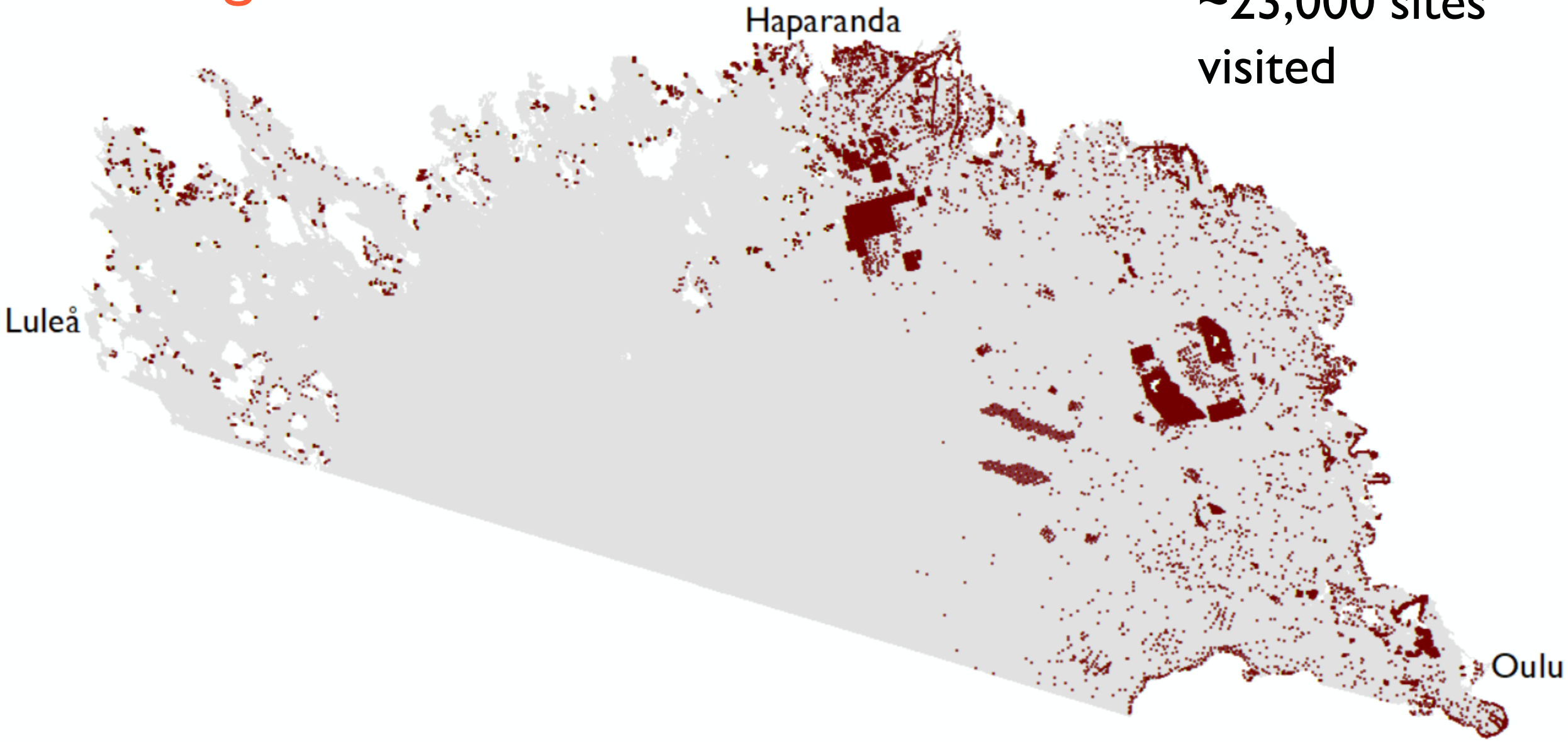

Earth observation products
Biological data
Geological surveys
Seamless biodiversity maps
Ecological modelling
Data on human activities
Expert knowledge: Mosaic framework

Biological data

~23,000 sites visited

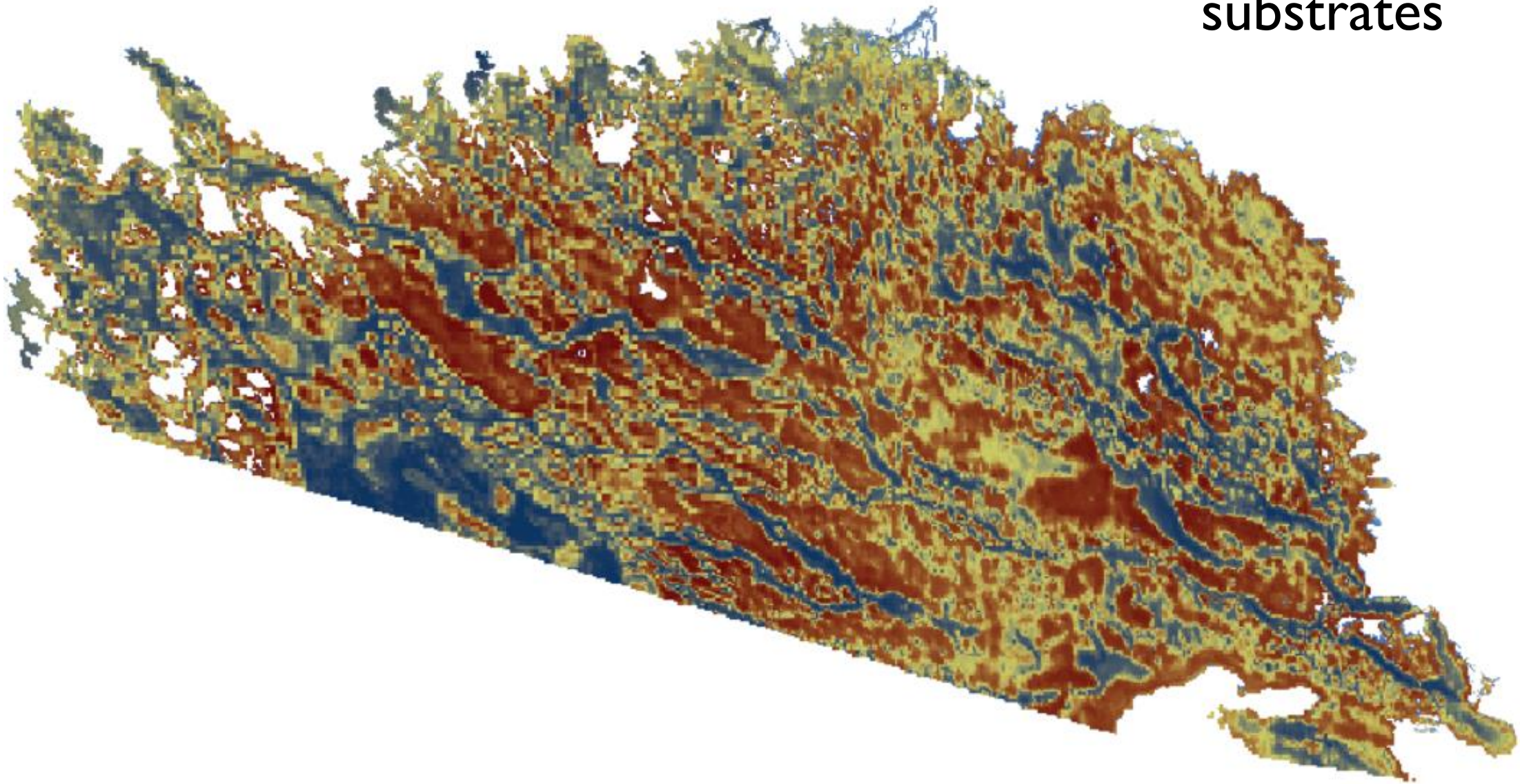


Environment: 23 data layers

- Physical and chemical parameters (e.g. salinity, nutrients, wave exposure)
- Geological surveys: seabed substrates
- Earth observation products

Geological surveys

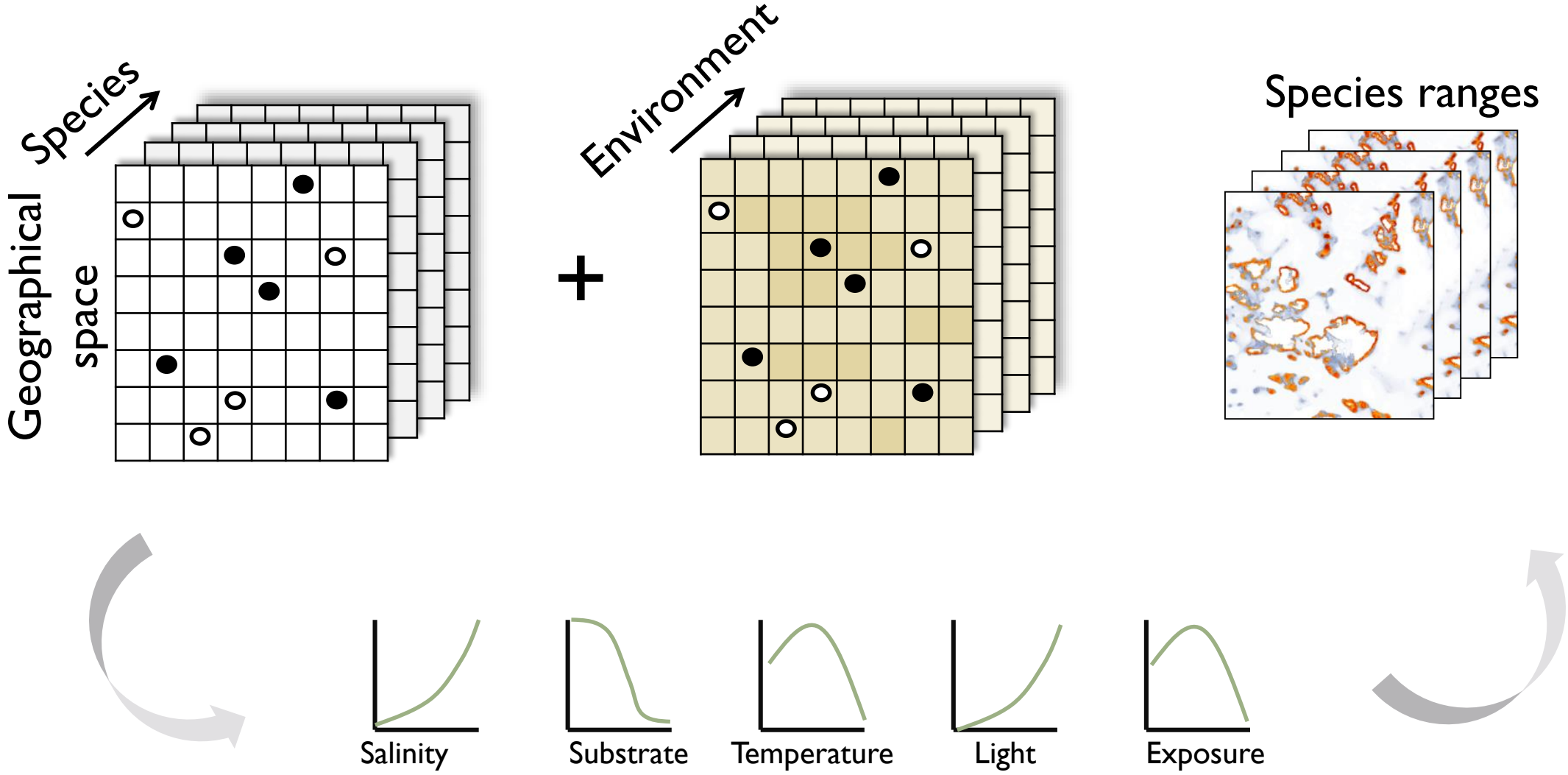
Hard substrates



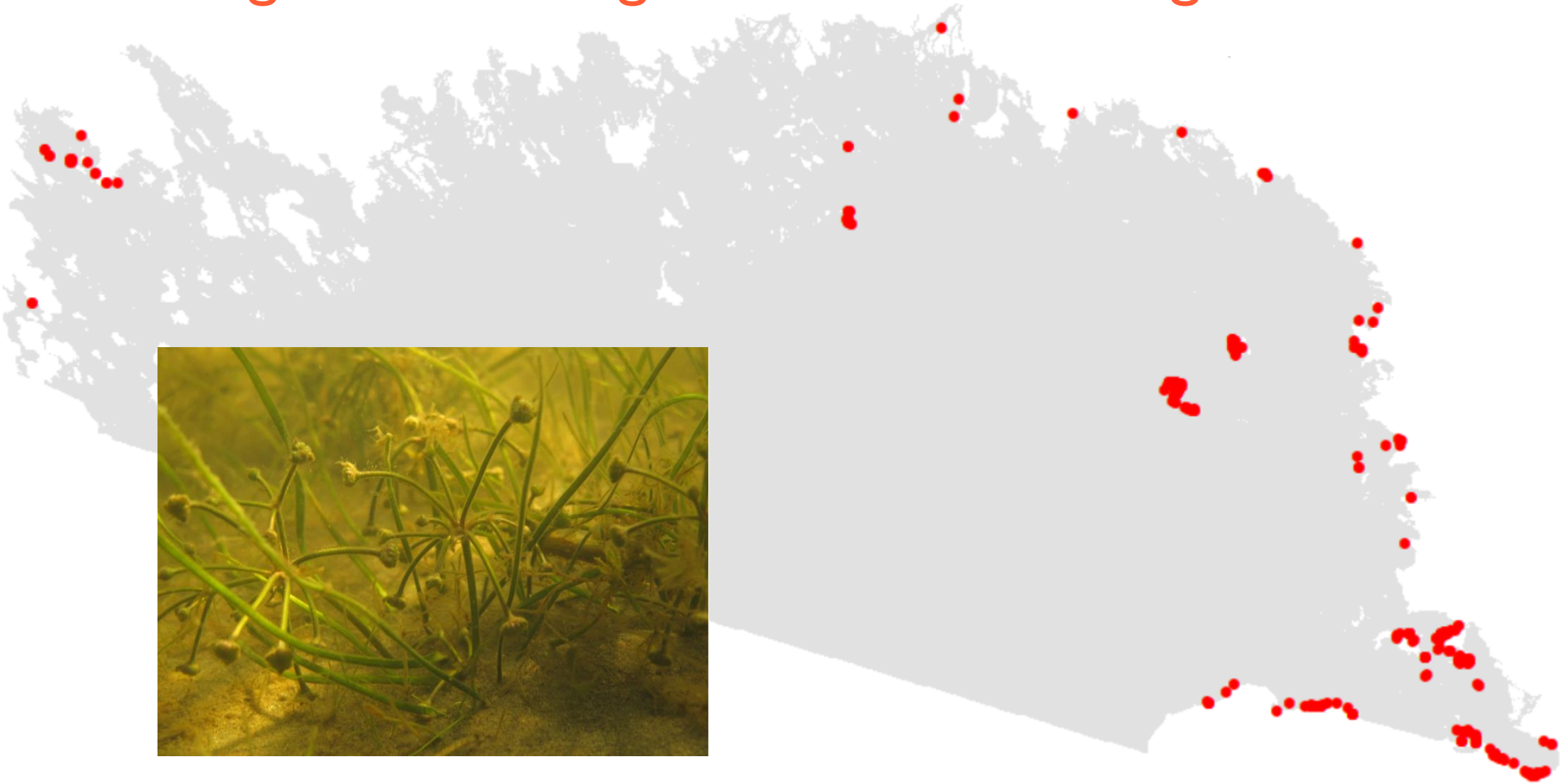
Earth observation

Shallow areas

Ecological modelling

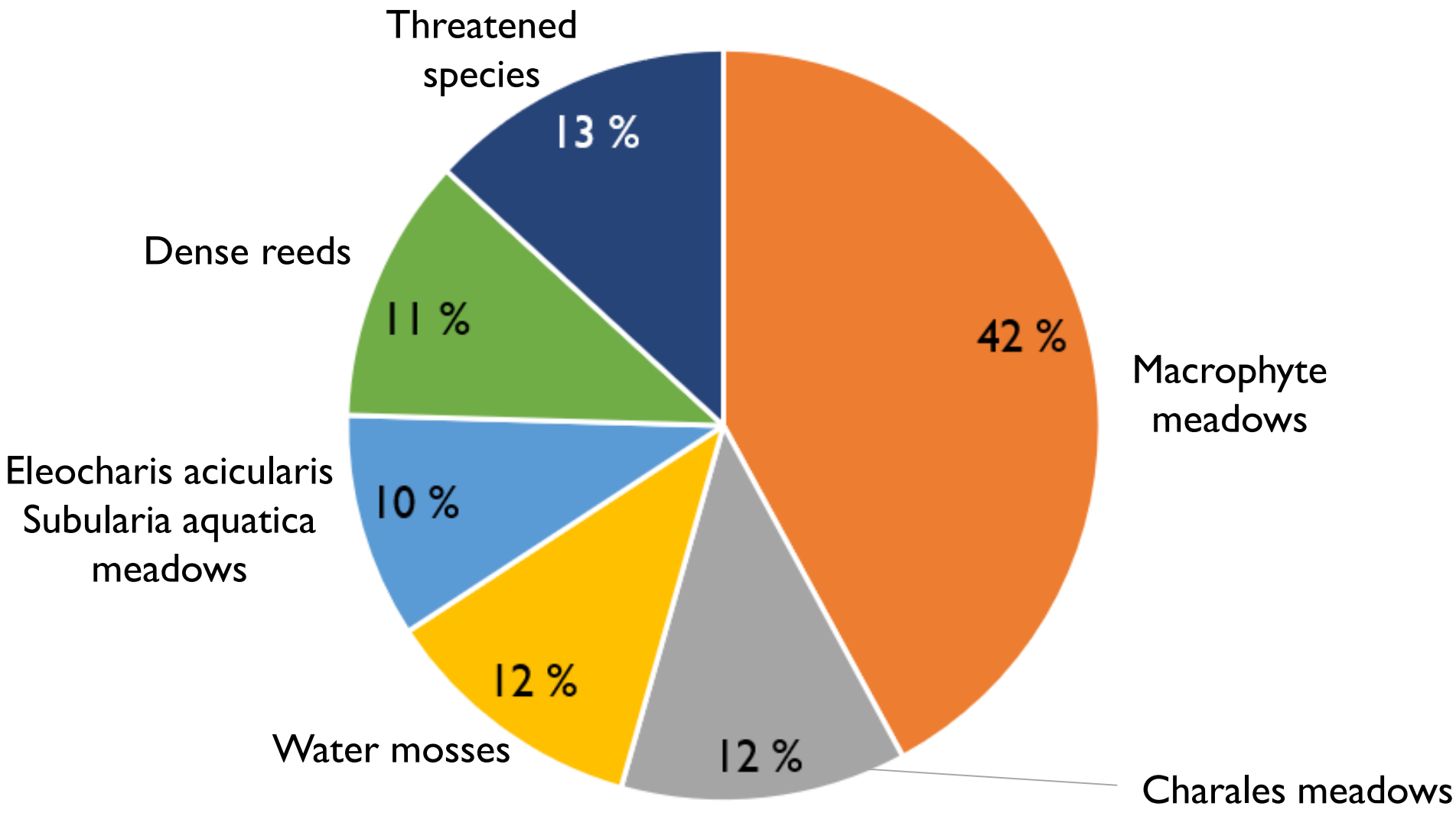


Ecological modelling: Alisma wahlenbergii

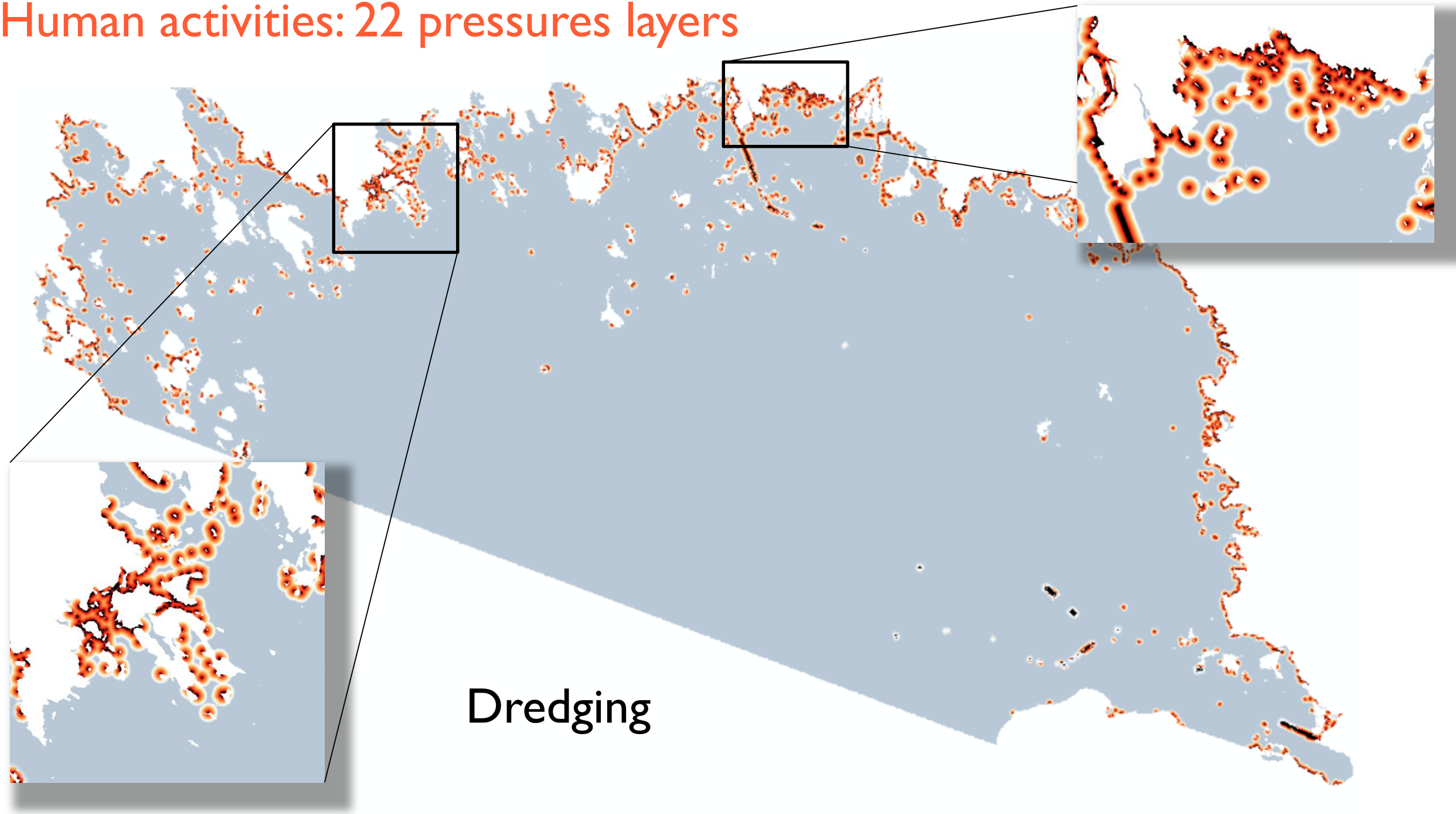


Probability of finding Alisma wahlenbergii

112 ecological models developed

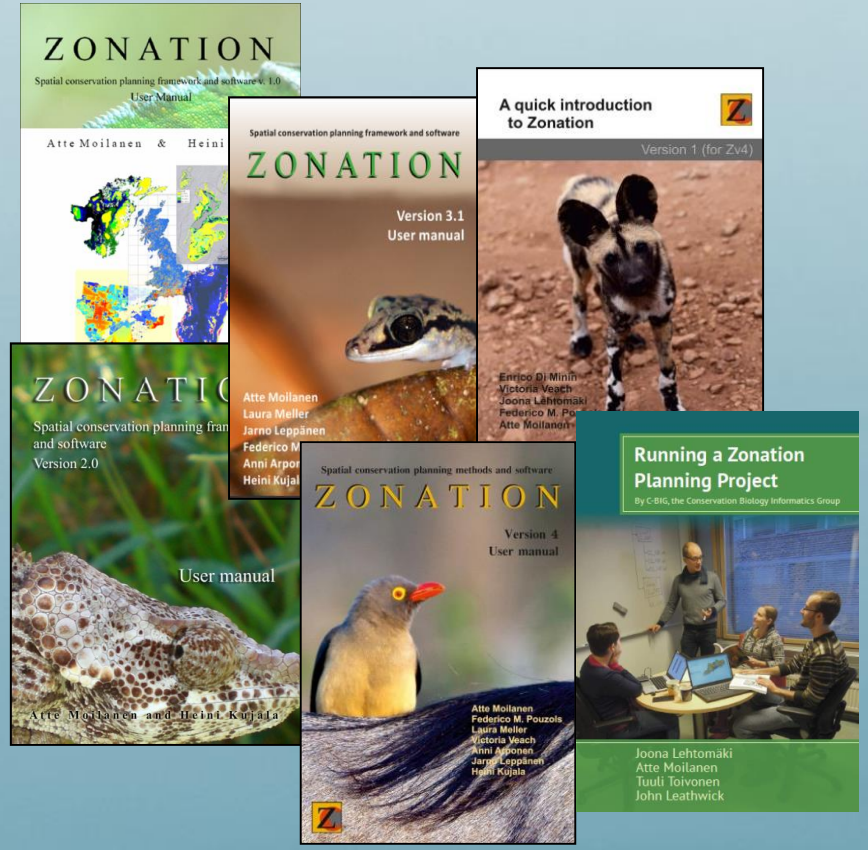


Human activities: 22 pressures layers



Where are the most valuable areas located?
© Manuel Deinhardt, MH

Zonation



Decision support-tool for ecologically based land use planning

Zonation:
Spatial prioritization through iterative ranking

Original values

4	10	15
5	23	32
20	40	51

Normalized values
Deletion of cells

	0.0510	0.0765
0.0255	0.1174	0.1632
0.102	0.2041	0.2602

Zonation:
Spatial prioritization through iterative ranking

Original values

4	10	15
5	23	32
20	40	51

Normalized values
Deletion of cells

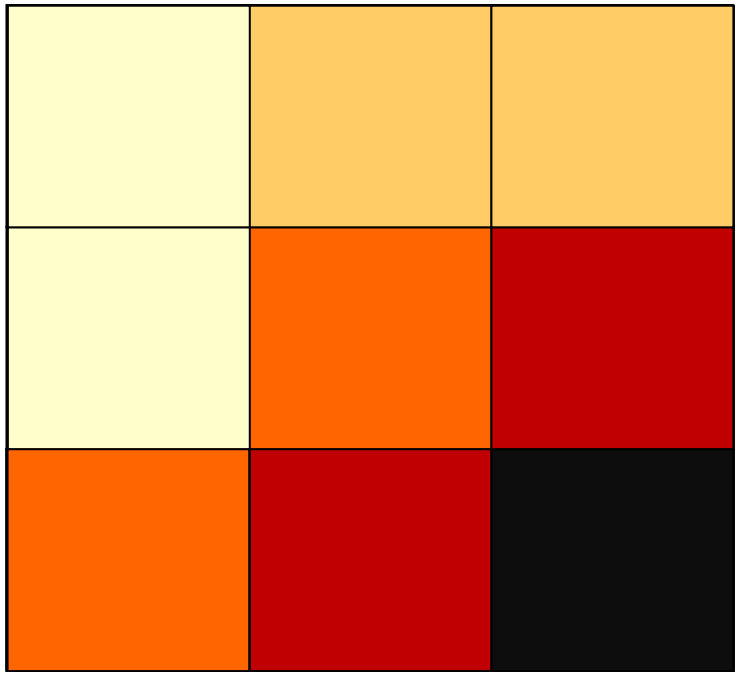
		0.2601
	0.3252	0.4146

Zonation:
Spatial prioritization through iterative ranking

Original values

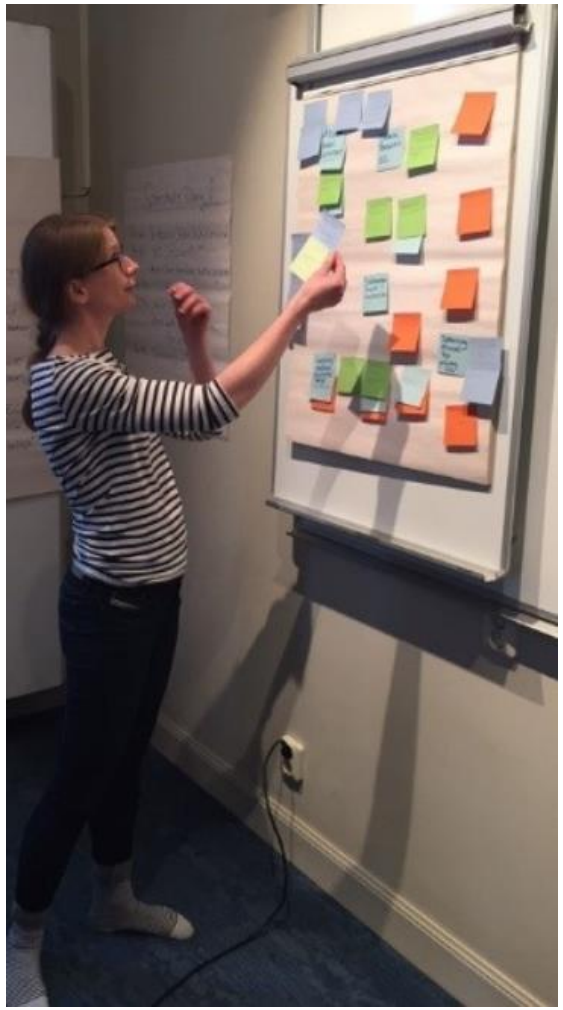
4	10	15
5	23	32
20	40	51

Normalized values
Deletion of cells



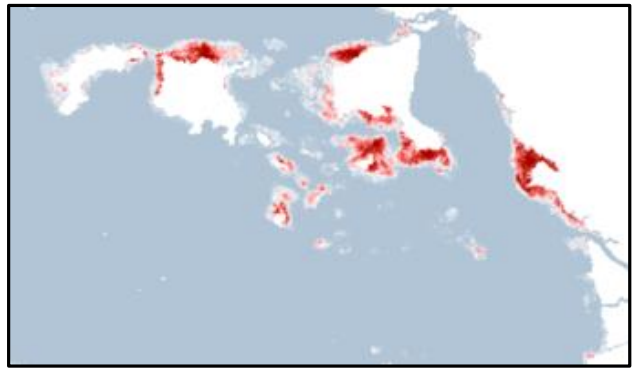
Definition of nature values: expert knowledge

- Mosaic framework
- Weights given to species, habitats and pressures
- Spatial extent and intensity of pressures defined

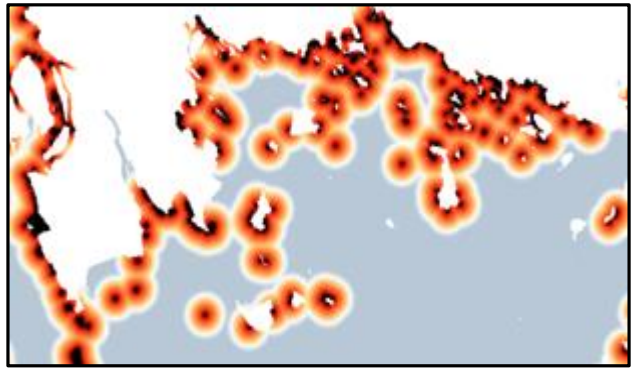


Nature values: input data

112 models



22 pressures



<u>In addition:</u>

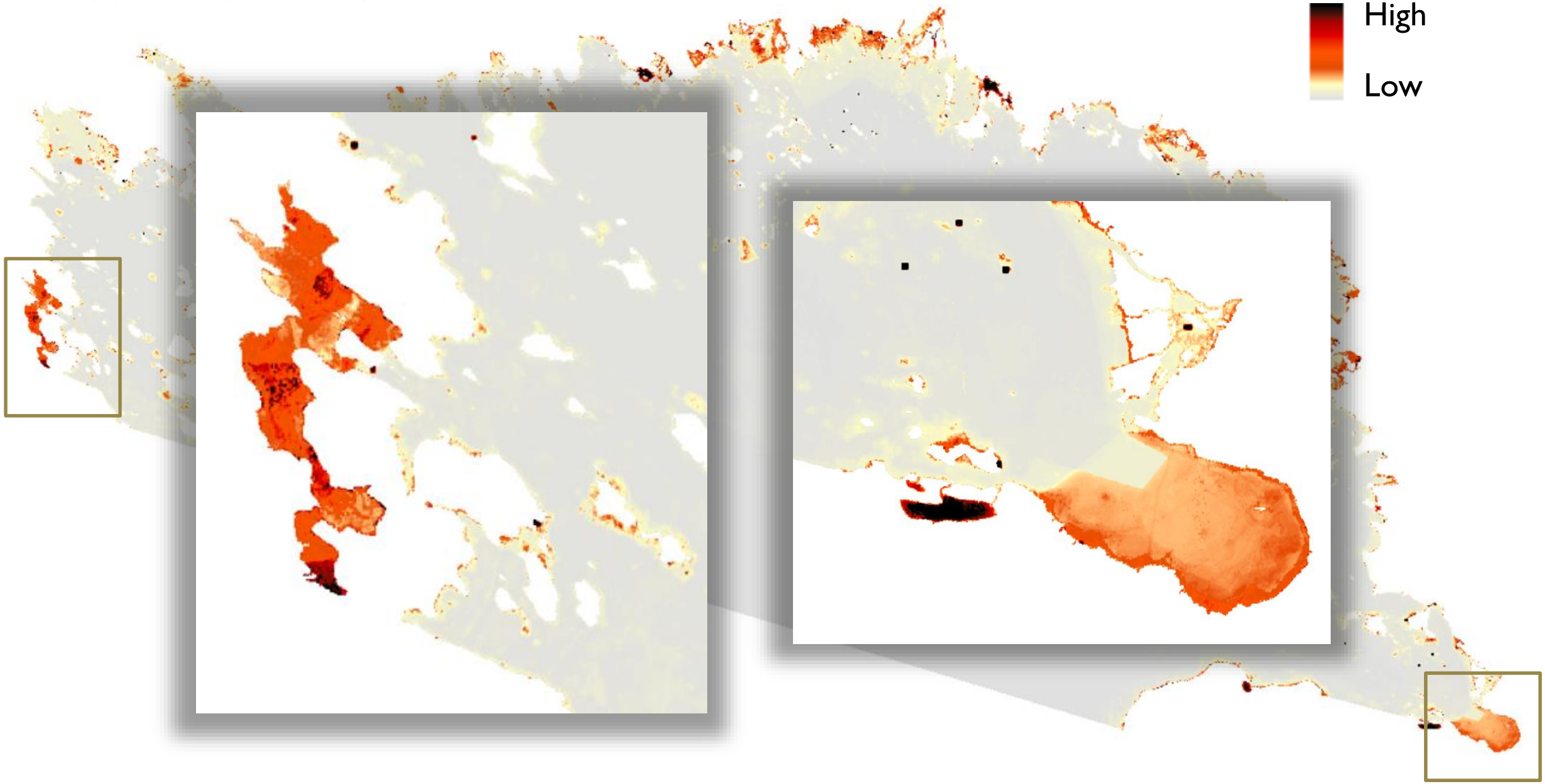
Habitats

Fish reproduction areas

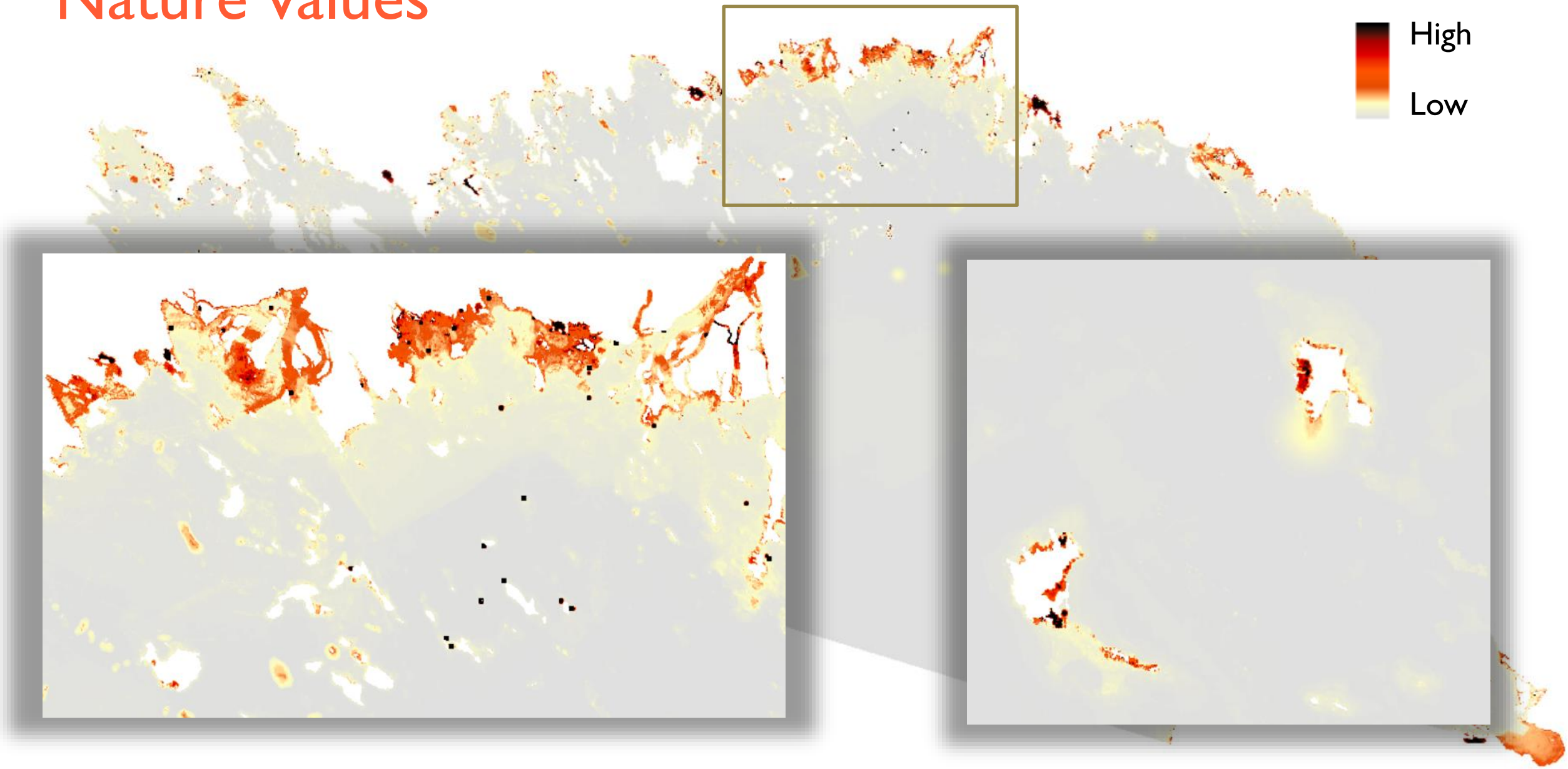
Important bird areas

Nature values?

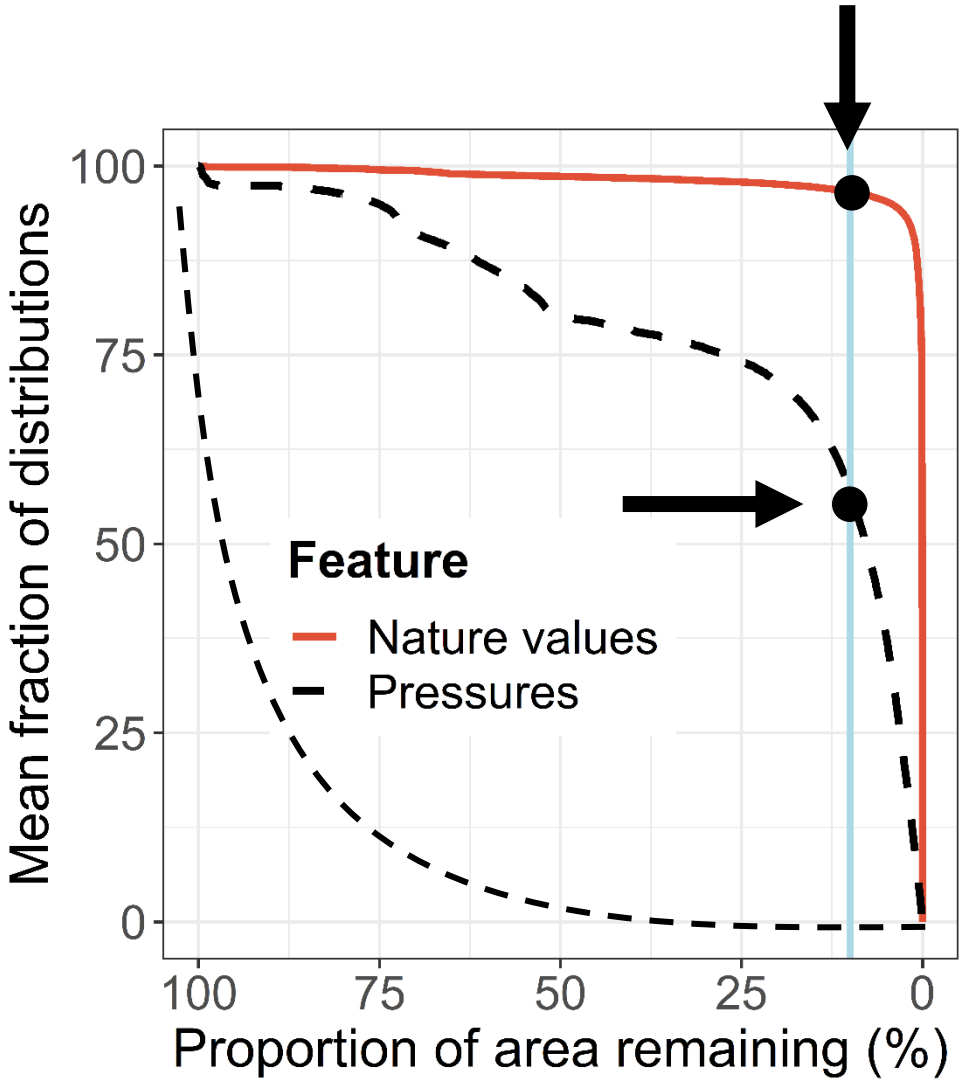
Nature values



Nature values



Nature values



- Nature values highly concentrated

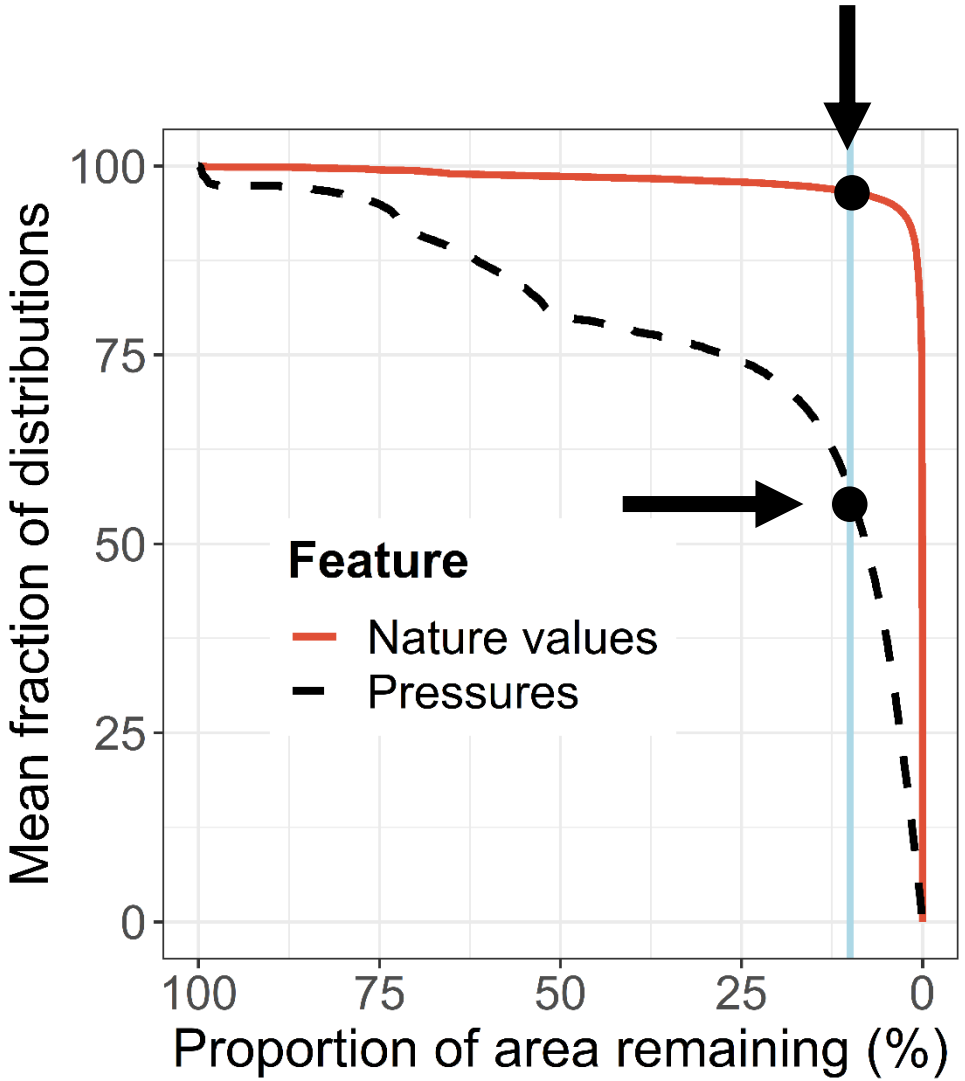
→10 % of the overall area includes

96 % of the nature values

AND

57 % of the pressures

Nature values



- Nature values highly concentrated

→10 % of the overall area includes

96 % of the nature values

AND

57 % of the pressures

- Nature values threatened by human activities

Conclusions

- Nature values highly concentrated in the Bothnian Bay

  … but threatened by various human activities

- Seamless biodiversity maps require a lot of data

  … and a good team!