Building a Climate Change adaptation strategy for the PA network in Finland

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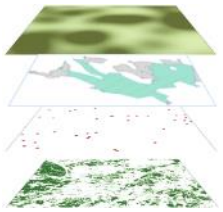
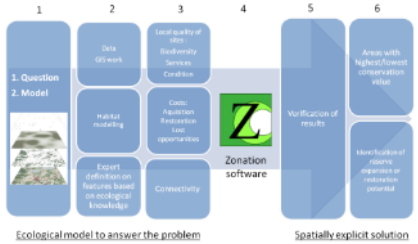
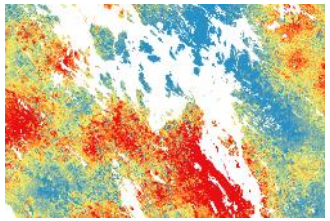
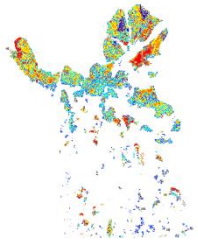
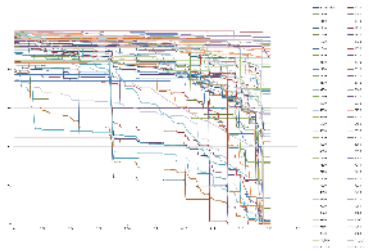










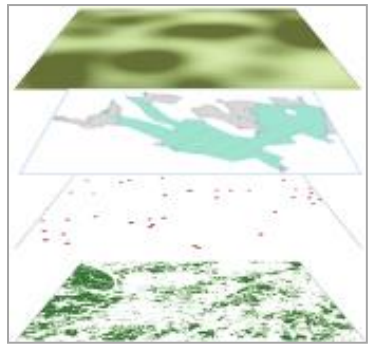
What do we need to strategically assess how to react to Climate Change and where?

1) Spatially explicit Climate Change rate -model -> where and how much
2) Spatially explicit habitat specific CC sensitivity -> where and how the CC is affecting the habitats (and species)
3) Spatially explicit biodiversity irreplaceability -> how important elements we lose if it happens

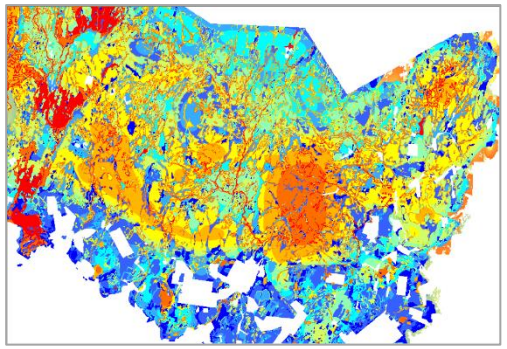
Many large-scale threat analyses seem to be missing the third part, i.e. the analyzed irreplaceability of different parts of a PA network. This is crucial information for larger scale strategic planning.

Network-level Climate Change adaptation strategy for protected areas in Finland

Data and analysis available:

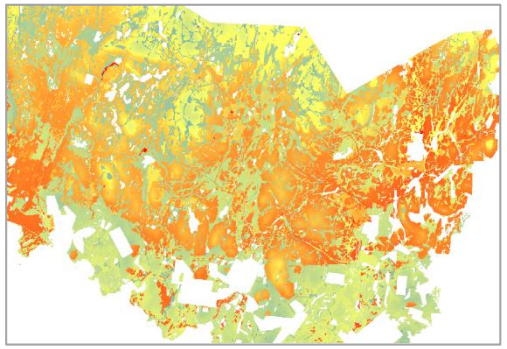


- PA irreplaceability analysis (Zonation software)
  - Habitats and their rarity, red list status, and condition: **detailed habitat polygon data for 1 541 protected areas**
  - **Threatened species occurrences**
  - **Connectedness in the landscape**

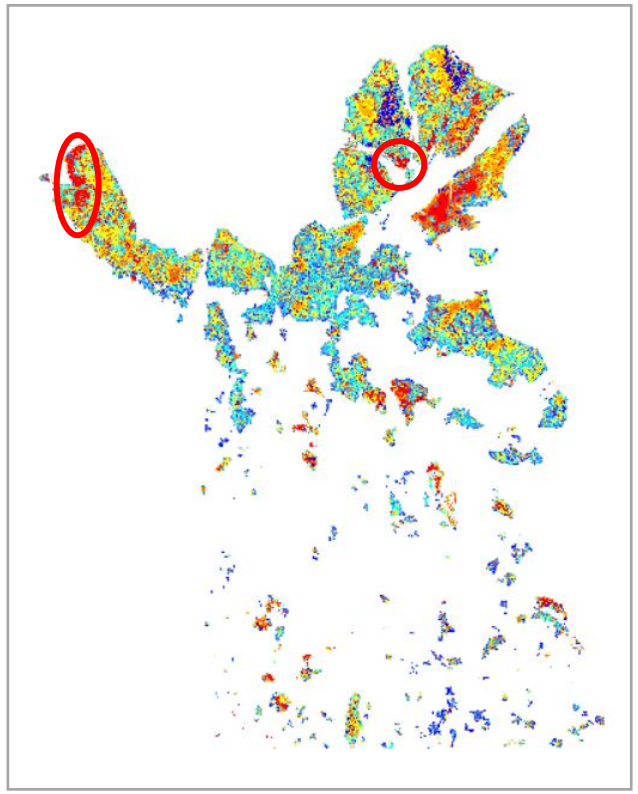


- Spatially explicit and habitat specific CC model by Finnish Environment Institute and the Finnish Meteorological Institute (https://link.springer.com/content/pdf/10.1038/s41598-020-58638-8.pdf)

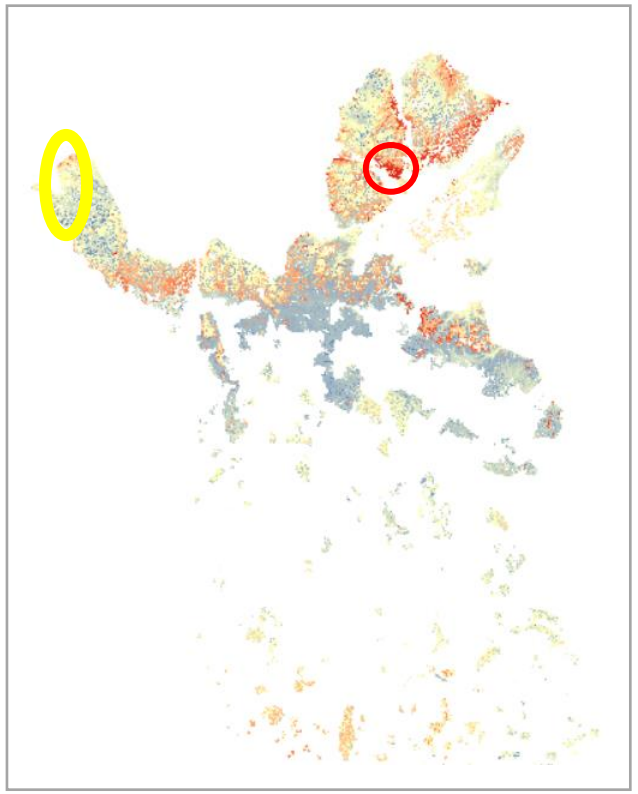
  Change in 6 factors : January avg. temp., July avg. temp., heat sum, water precipitation, snow precipitation, water balance, 10m raster data



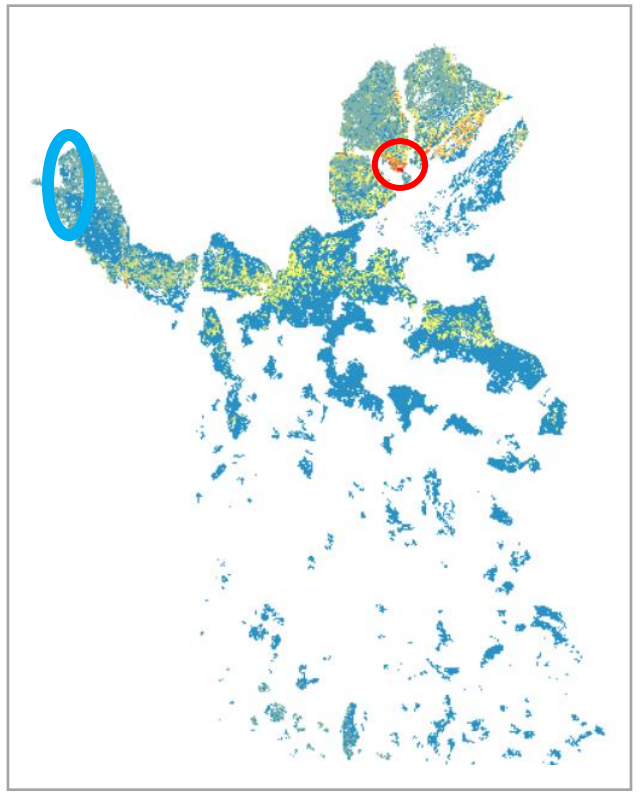
1. **Change within habitats' climate envelopes**
2. **How many of the 6 different factors will go outside their current habitat specific climate envelopes**



Irreplaceability of biodiversity features (habitats and species)



Level of change in habitat patches' environmental conditions



Number of parametres moving outside the habitat's climate envelope

How to react? Building strategy following the Resist-Accept-Direct (RAD) concept

(https://www.nps.gov/subjects/climatechange/radframework.htm)

Two major elements

1. Climate Change at habitat patch level
2. Irreplaceability/importance of the areas for biodiversity at network level

The matrix of outcomes: **no change x not important**, **no change x important**, **change x not important**, **change x important**, **too much change x important**

1. **No change x not important** and **change x not important**: **identifying no need and lowest priority** –> accepting or directing (if feasible, or other reasons than BD)
2. **Change x important** : **Identifying where we can most potentially make a difference!** -> resisting or significantly directing
3. **Too much change x important**: **Identifying areas where we need to monitor the changes, think new ways, or look for possible opportunities to arise** –> or just accept
4. **No change x important**: **Identifying Climate Change refugia where all <u>stoppable (other) threats must be stopped</u>!!**

How to react? Building strategy following the Resist-Accept-Direct (RAD) concept

(https://www.nps.gov/subjects/climatechange/radframework.htm)

How to best complement the areas that seem to be remaining

- Building a complementary based analysis based on knowledge about the refugia

Identifying knowledge and data gaps

Identifying trade-offs and analyzing cost-effectiveness

Identifying the magnitude of the problem

Implementation

Analysis results will affect strategic planning, but are also implemented at PA level management planning

Tools for PA level planning are being selected and tested for effective systematic implementation of the network level results

Think big, act local!

Thank you for listening!

Collaboration is the key for looking into the future:

Tuula Kurikka, Parks & Wildlife Finland (Metsähallitus)
Risto Heikkinen, Finnish Environment Institute (SYKE)
Kaisu Aapala, Finnish Environment Institute (SYKE)
Niko Leikola, Finnish Environment Institute (SYKE)
Linda Kartano, Finnish Environment Institute (SYKE)
Juha Aalto, Finnish Meteorological Institute

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MEAHCIRÁÐÐEHUS