

Determining the hydrological implications of regulation on Swedish lakes with space observations

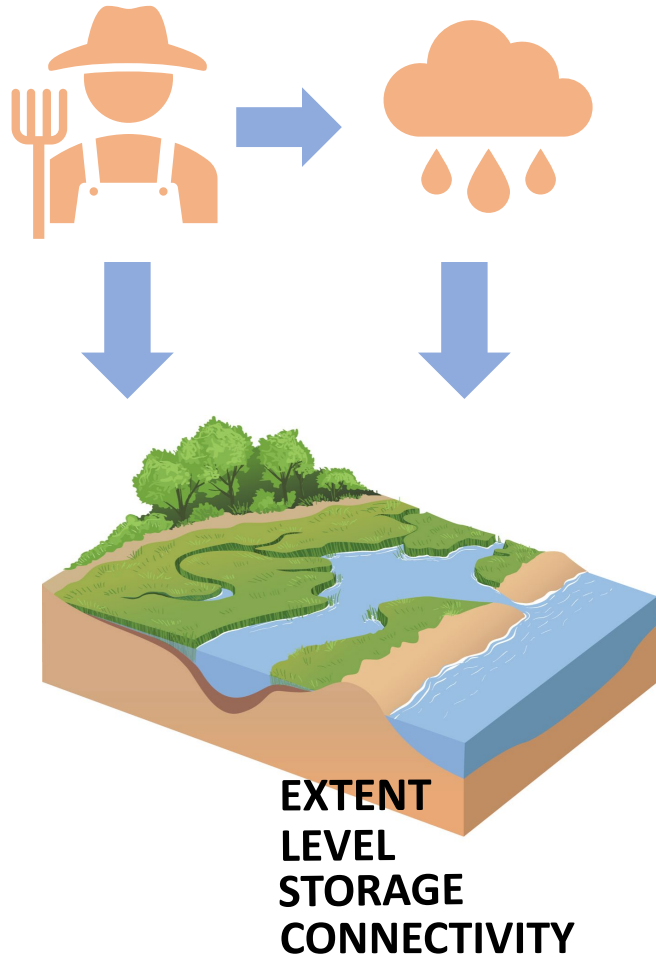
Fernando Jaramillo, Saeid Aminjafari,
Ian Brown, Frédéric Frappart, Fabrice Papa
Department of Physical Geography
Stockholm University



Stockholm
University

We need to understand changes in water resources

Changes in water availability

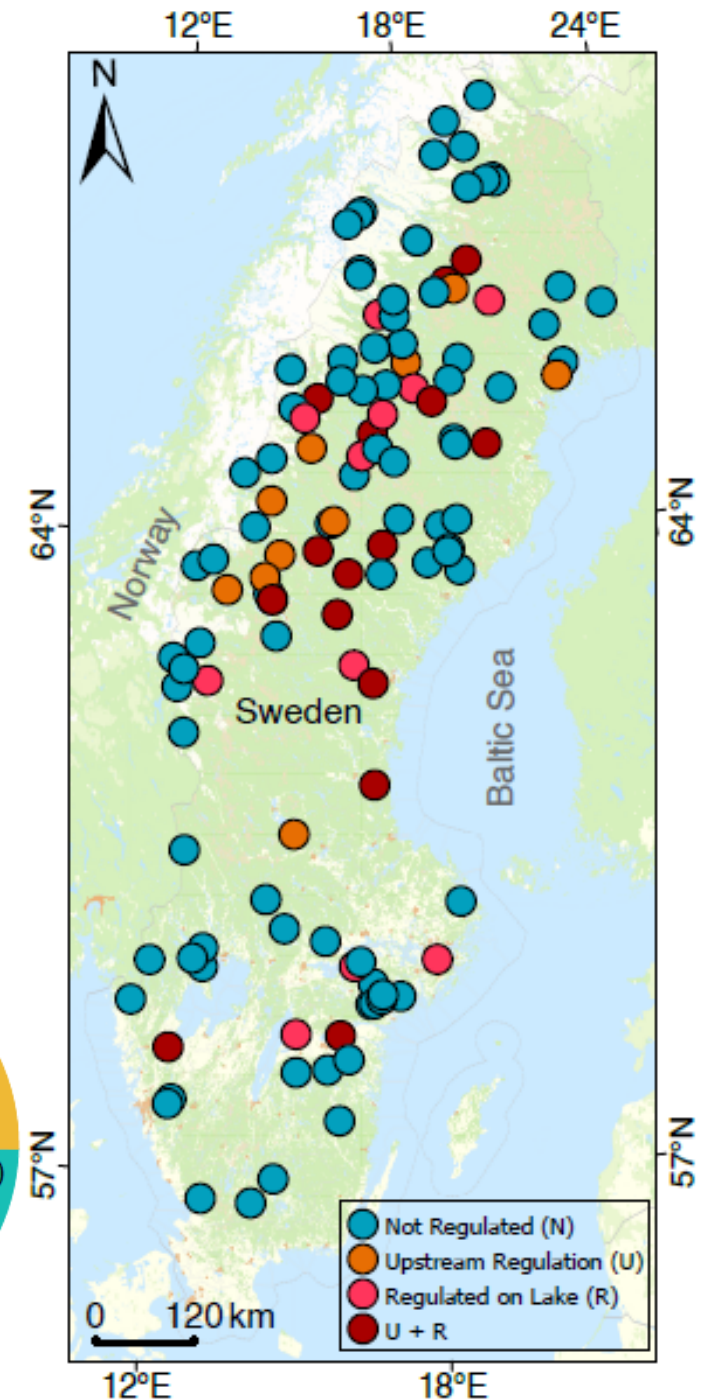
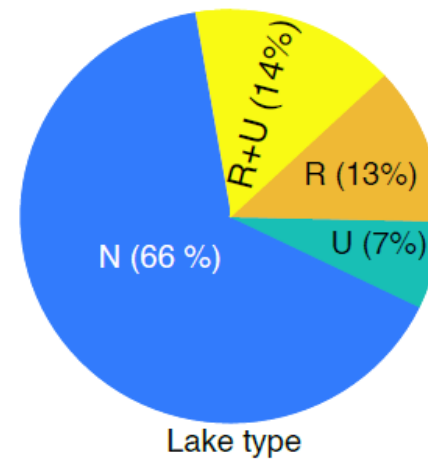


Research questions

1. How are water levels in Swedish lakes recently changing?
2. Is there any evident signal of regulation on these changes?

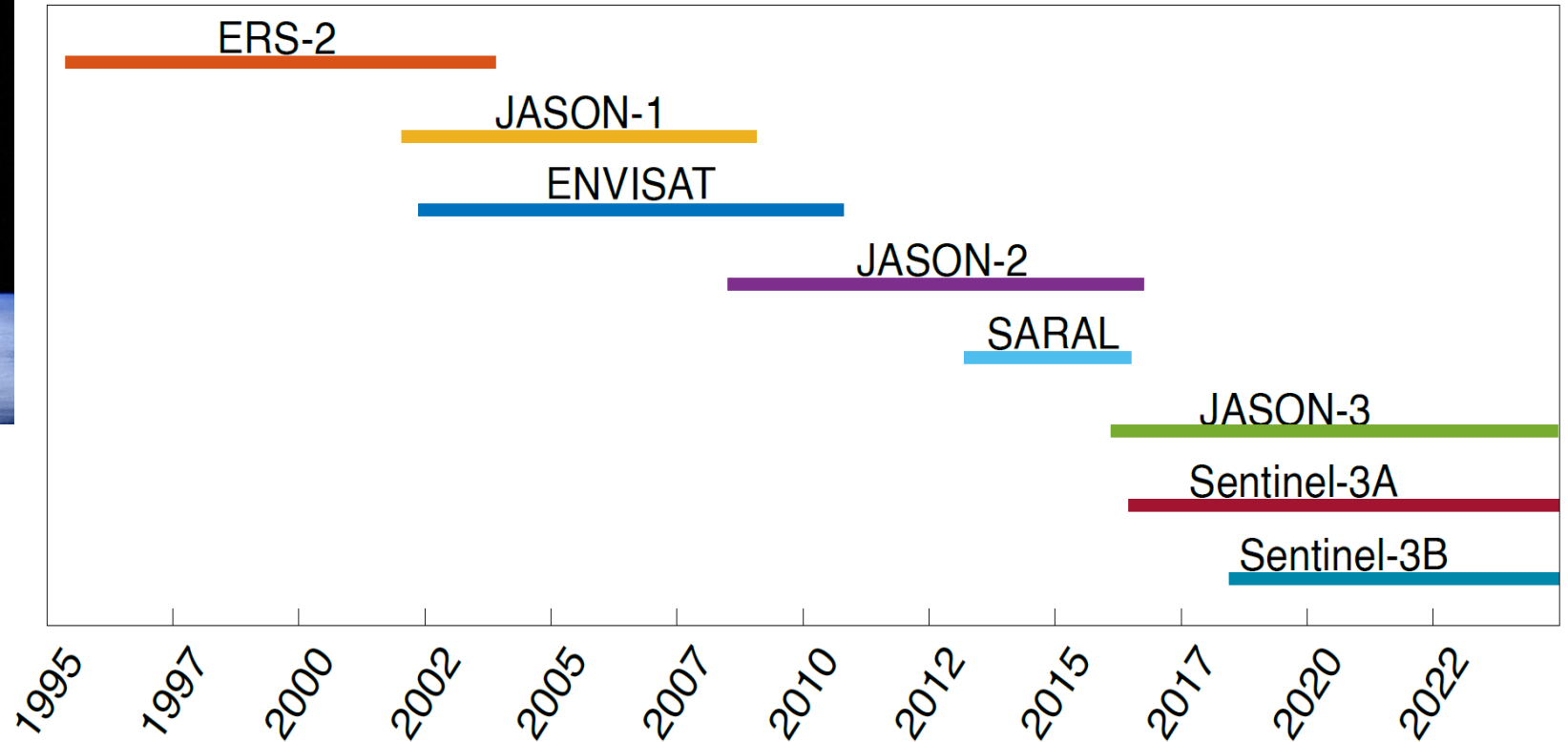


- 39 lakes monitored with gauges by SMHI
- ~150 lakes monitored from space





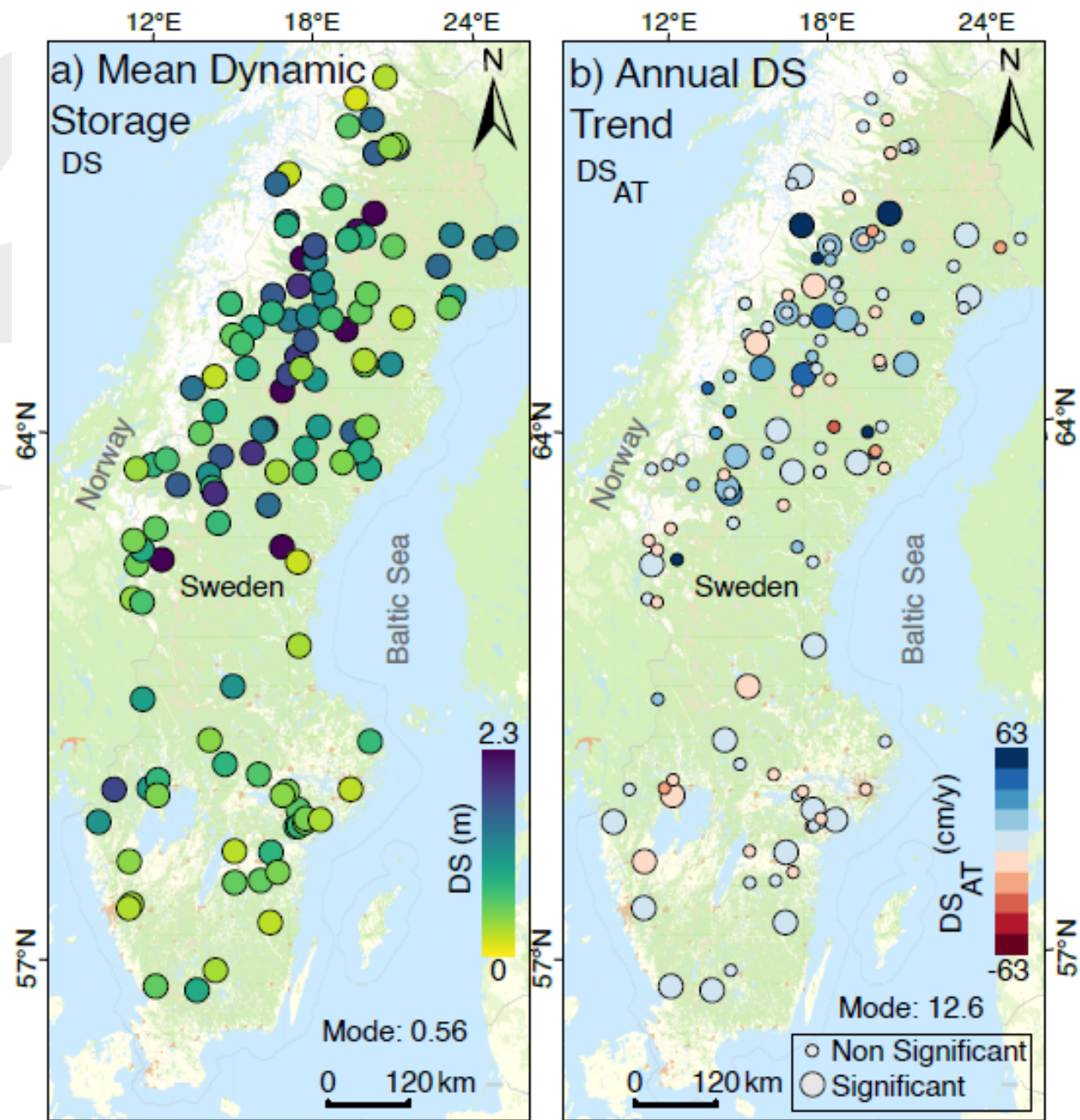
Water level can be monitored from space...

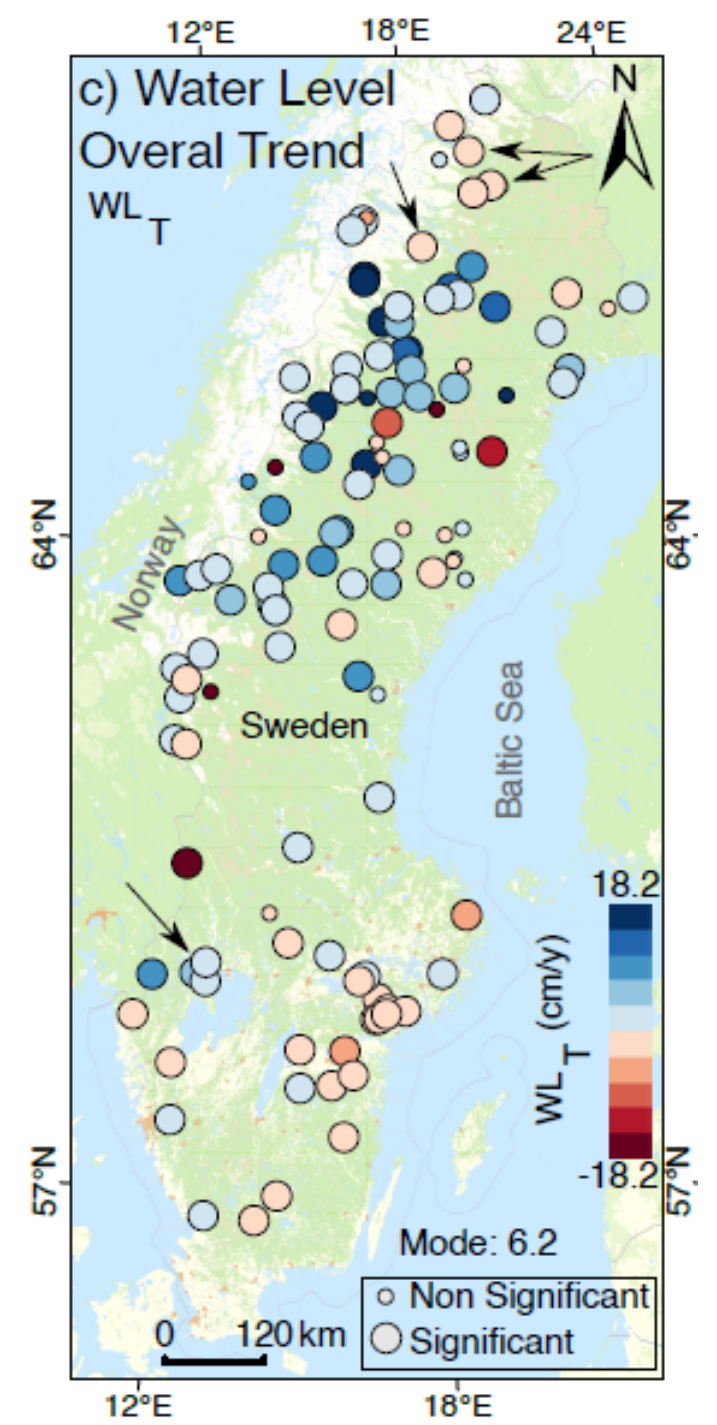


Maillard et al. (2015)



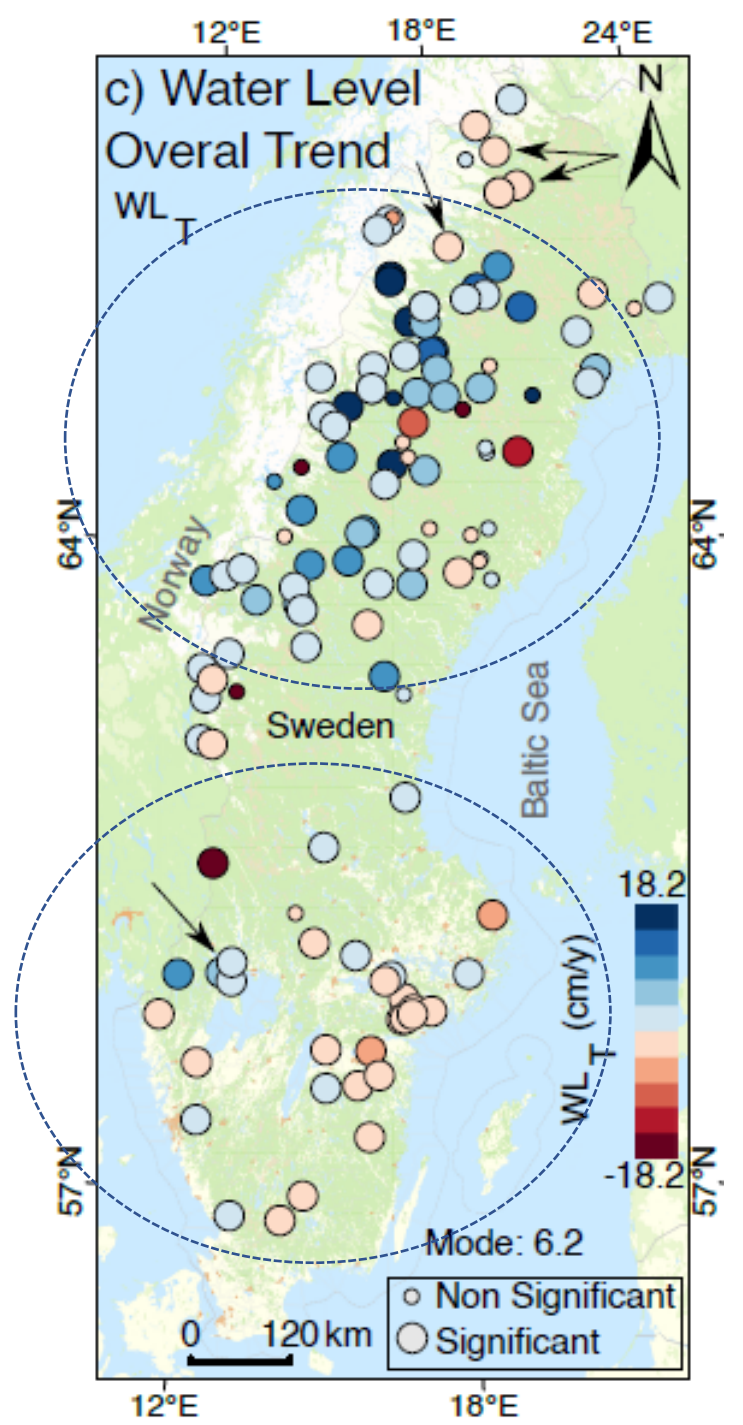
Dynamic Storage in lakes and reservoirs (2013-2022)



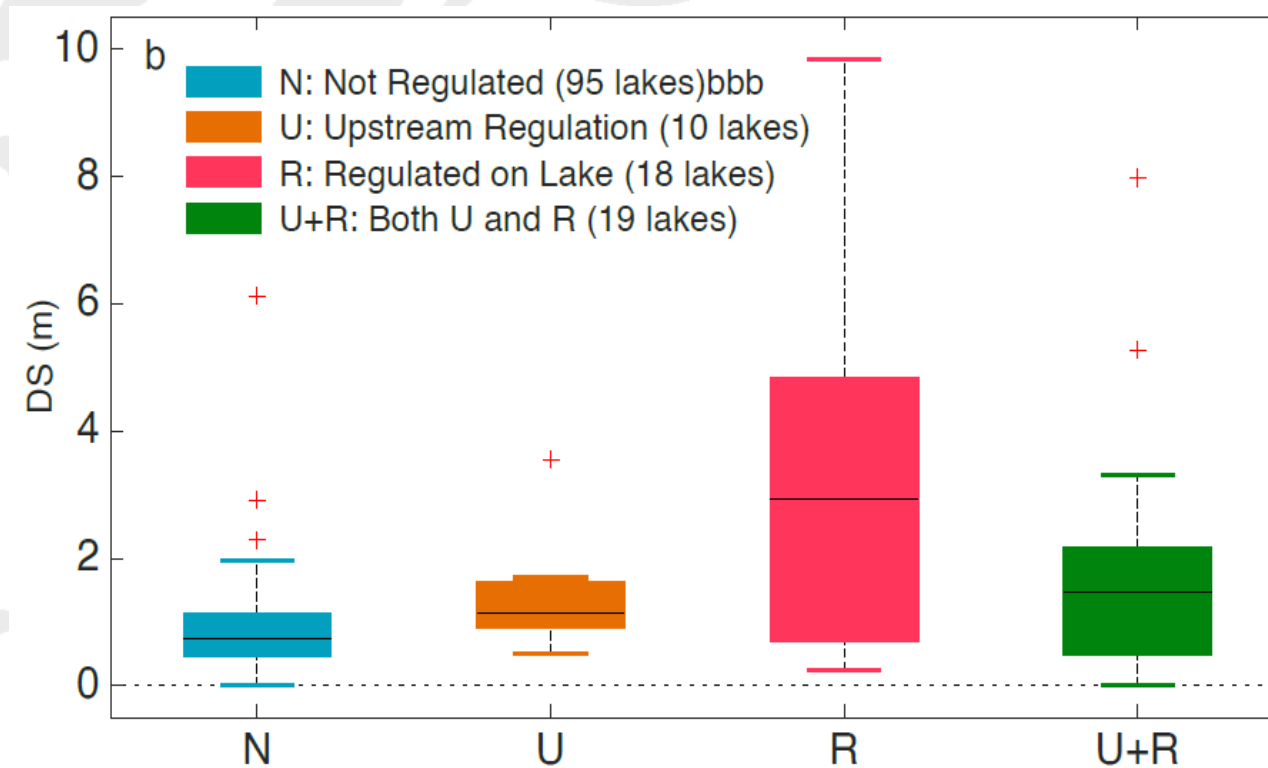


Increase

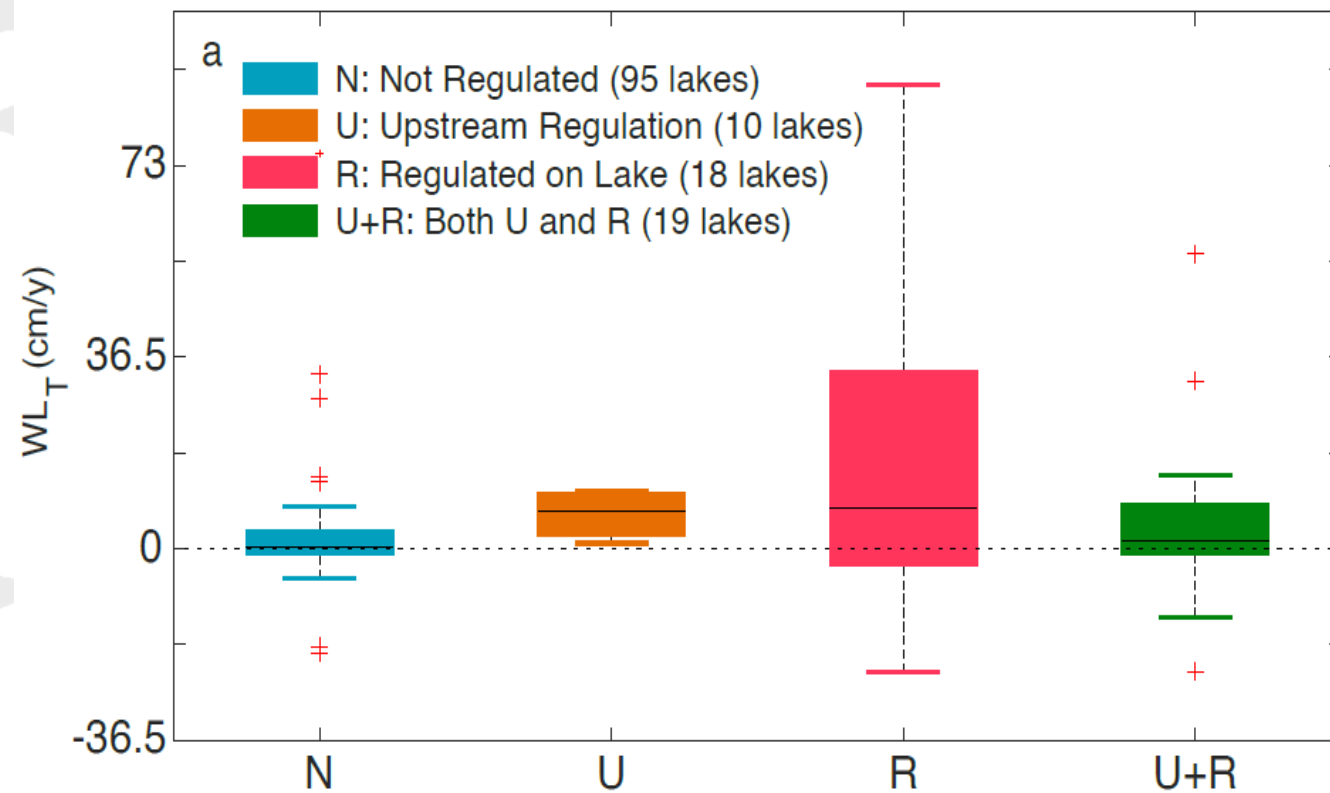
Decrease

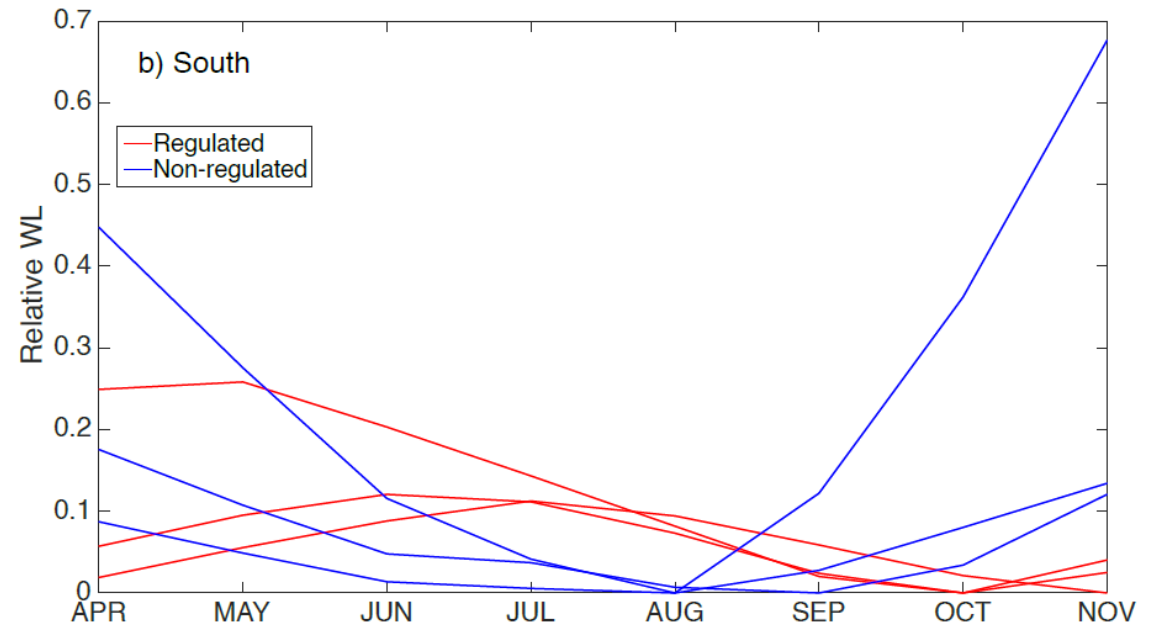
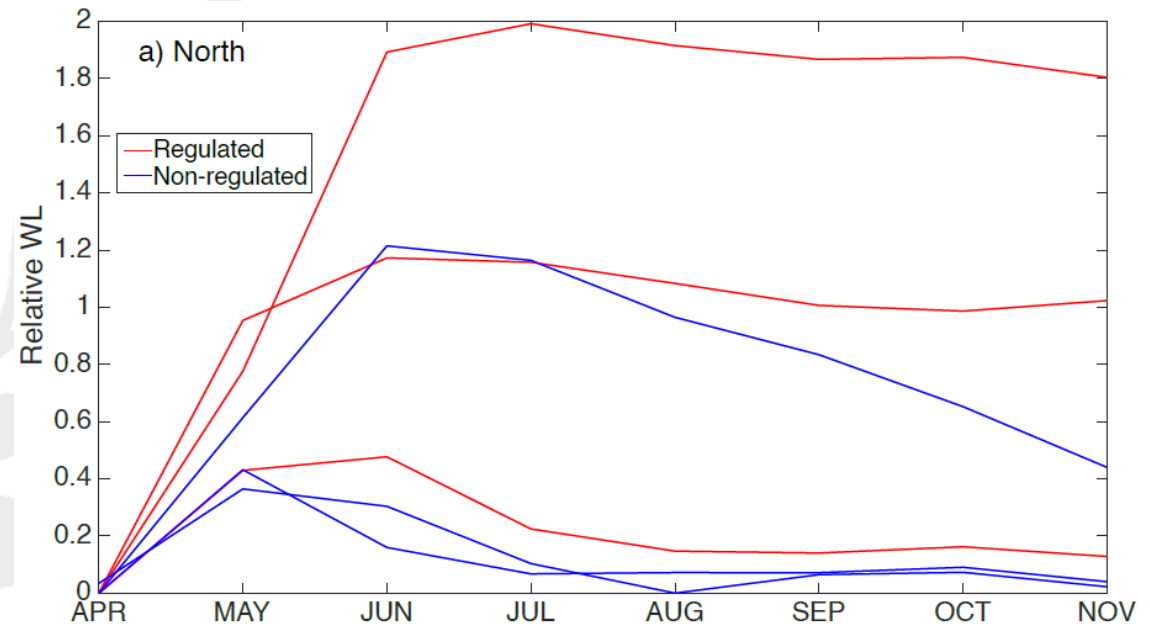
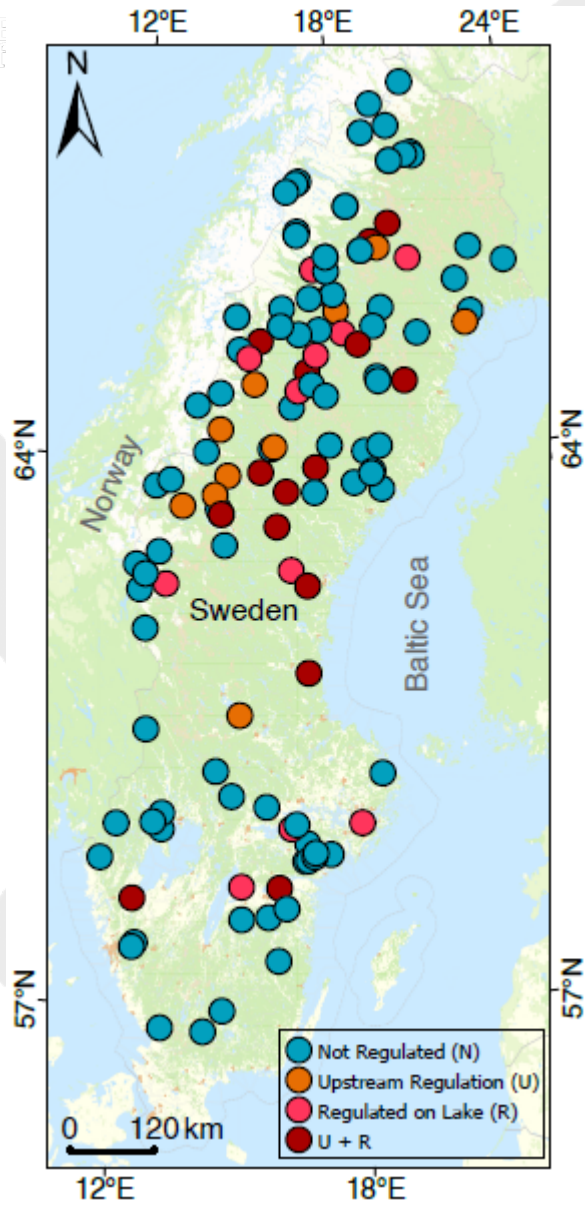


Dynamic Storage impacts of regulation 2013 - 2022



Water level trends in 150 lakes (2013 – 2022)







Conclusions

1. The first country-scale study of changes in Swedish lake water levels
2. Successfully determined water level changes from space
3. Distinctive patterns of changes:
North-South and
Regulated-Not Regulated

FORMAS



Vetenskapsrådet



Myndigheten för
samhällsskydd
och beredskap



Rymdstyrelsen
Swedish National Space Agency