

# A status report on coastal groundwater in Western Sweden



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## Background

- Project title: *“The status and future of coastal groundwater – implications for groundwater quality and quantity under increased pressures and climate change”*
  - Financed by SGU
  - Knowledge-base of coastal groundwater in Sweden
  - Tools and guidelines for planning and management for municipalities



# Groundwater problems in coastal areas in Sweden

- Saltwater (intrusion)
  - Proximity to the sea
  - Relict salt
- Water Scarcity
  - Coastal areas (outside town centers) are usually sparsely populated and **not connected to public water supply**
- Water Quality: natural and anthropogenic contamination
  - See above: salt [metals]
  - See above: not connected to public waste water systems, private wells often “in bad shape” – microbiological contamination



# Methodology

- Literature review, collection and evaluation of previous investigations and data;
- Interviews and surveys;
- Case studies at selected field sites;
- Compilation of a knowledge base of coastal zone groundwater in Sweden.



## Results / done so far: overview

- Review article
  - Coastal groundwater in crystalline bedrock areas: what can be learned from international literature
- Case studies
  - **Koster islands: 2 articles in preparation (Hydrogeological aspects and Social Aspects)**
  - Uddevalla
- **Evaluation of the private well groundwater chemistry data (SGU)**
- Inventory of approaches and tools used by Swedish municipalities



## Surveys: Answers, examples

“Miljöbalken reglerar redan användning, med möjlighet till lokala föreskrifter för att undvika brist på sött grundvatten. **Behov finns att se över lagstiftningen och förtydliga miljöbalkens generella skrivningar** med detaljerade föreskrifter som omfattar både användning och undersökning av grund- och dricksvatten i kustområden. **Lagstiftning om undersökningar skulle också tvinga kommunerna att prioritera dricksvattenfrågan.**”

”Det borde finnas en **nationell styrning**, då detta är det ett livsmedel”



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# Enskilda brunnar och dricksvattenförsörjning

En fallstudie med fokus på att generera en  
överblick av problem, handläggning, reglering  
och kunskap i en västsvensk kustkommun.

Two Master's Thesis focusing on how Swedish municipalities deal with problems with coastal groundwater, one local, one nationwide:

- Problem awareness
- Knowledge
- Investigations and measures
- Rules, Laws and guidelines



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STANDARDISING COASTAL GROUNDWATER RESOURCE  
ASSESSMENTS IN SWEDEN – A FEASIBILITY STUDY

INGMAR GEUZE

# Case study: The Koster islands



Claiming to have most sunshine hours in Sweden ...

Winter / all year round population on Koster: ~ 235

Summer, peak holiday season: ~ 6000 overnight guests / day

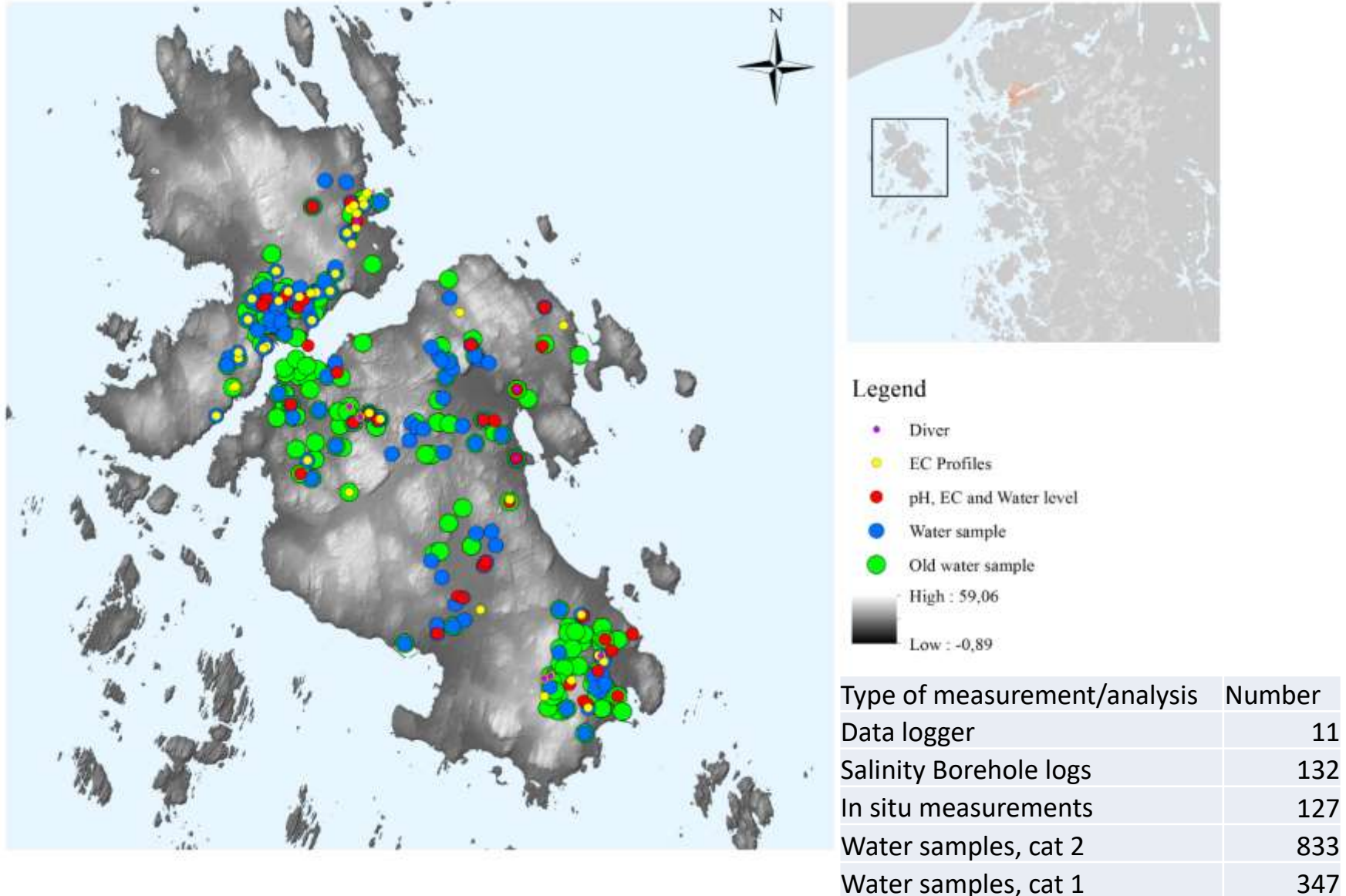
**All water supply: local**





# Sampling and Monitoring: started spring 2016

5 sampling campaigns: April 2016 – July – October – December - April 2017





# Conclusions

- Hydrogeological conditions in coastal areas are complex and heterogeneous; each location is unique
- By combining all existing data (old and new) with advanced data analysis we can improve the understanding of coastal groundwater system in Sweden a lot
- The question is though: Can we improve and generalize our knowledge to a degree that enables us to answer the **actual questions?**
- What are the **actual questions**, anyway?



# Conclusions – or rather: more questions

- Are we talking about problems related to public water supply or private well issues? “Who owns the problem?”
- For the majority of coastal communities this is a private well issue only and relatively few see it as the municipality’s responsibility
- Our surveys, interviews and case studies indicate that coastal municipalities struggle less with hydrogeology than with unclear legislation, unclear distribution of responsibilities and a lack of guidance: What problems need to be considered, avoided, and why?

”Det borde finnas en **nationell styrning**, då detta är det ett livsmedel”