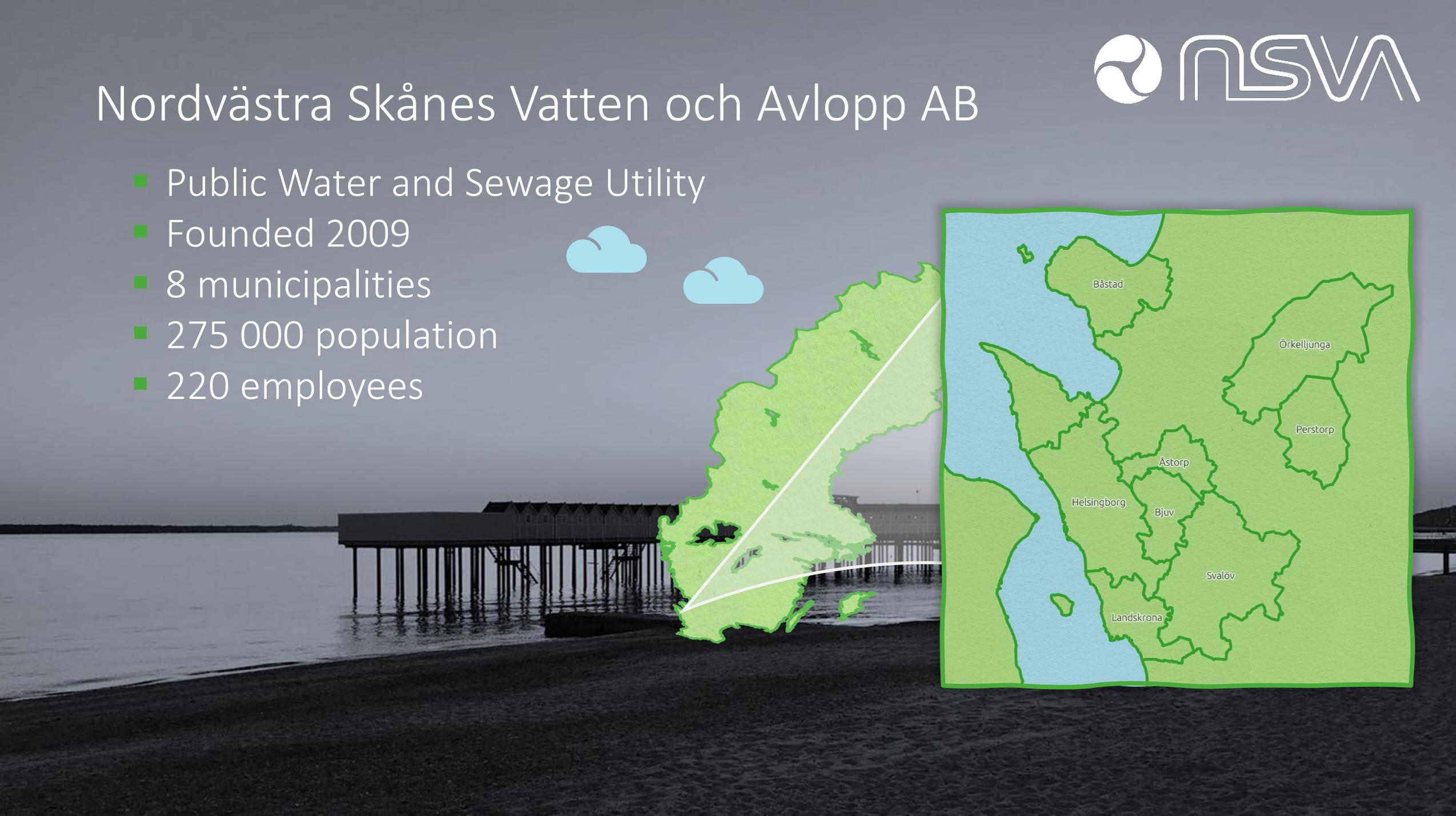


Why do utilities need a weather radar and why collaborate?



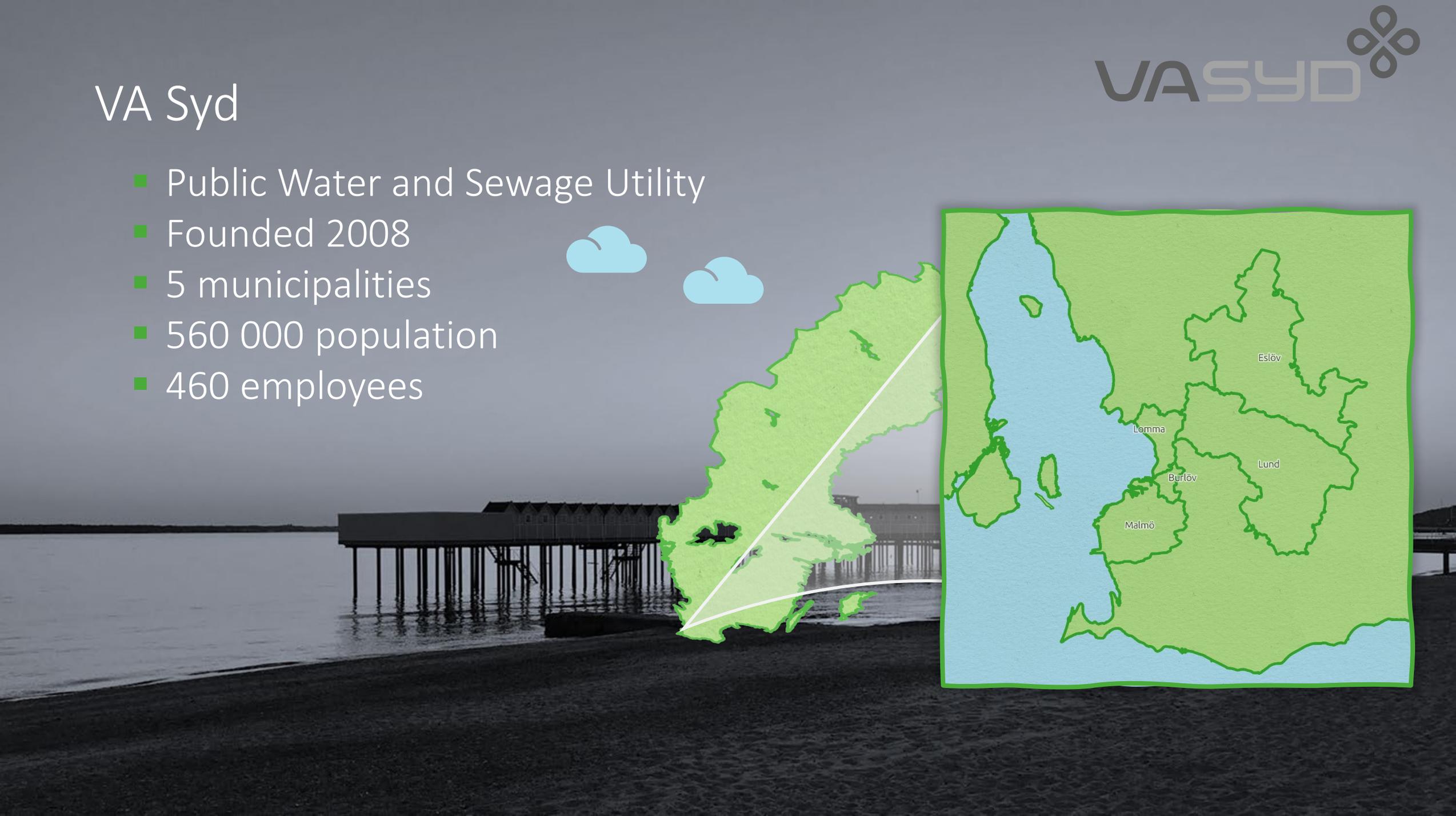
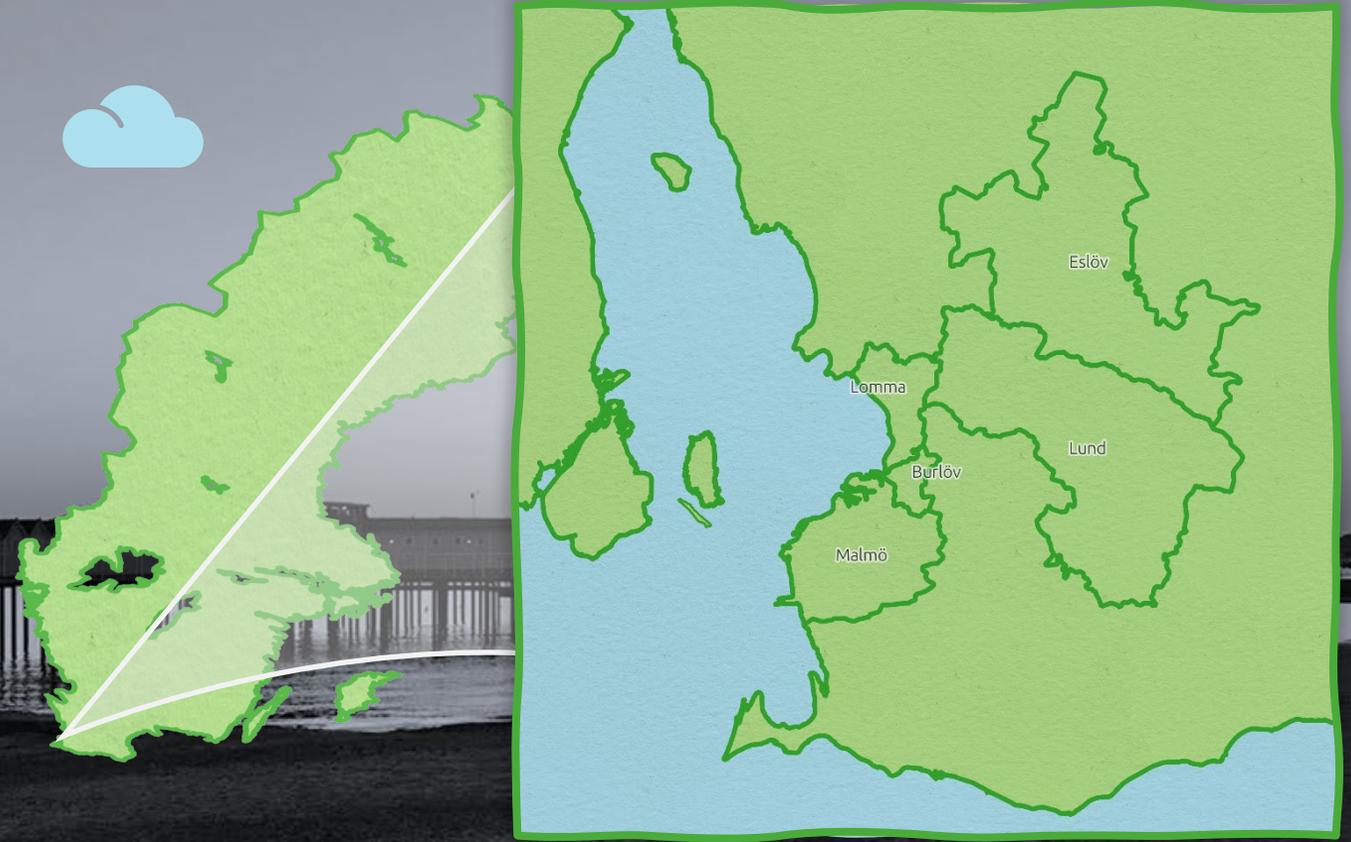
Nordvästra Skånes Vatten och Avlopp AB

- Public Water and Sewage Utility
- Founded 2009
- 8 municipalities
- 275 000 population
- 220 employees



VA Syd

- Public Water and Sewage Utility
- Founded 2008
- 5 municipalities
- 560 000 population
- 460 employees



Why do utilities need a weather radar and why collaborate?



- Knowledge of rain is really important
- We are looking to implement and operate the necessary technologies enables us the best utilisation of available radar data.



sweden
water
research

- And to lower thresholds for utilisation of and research with this data going forward.



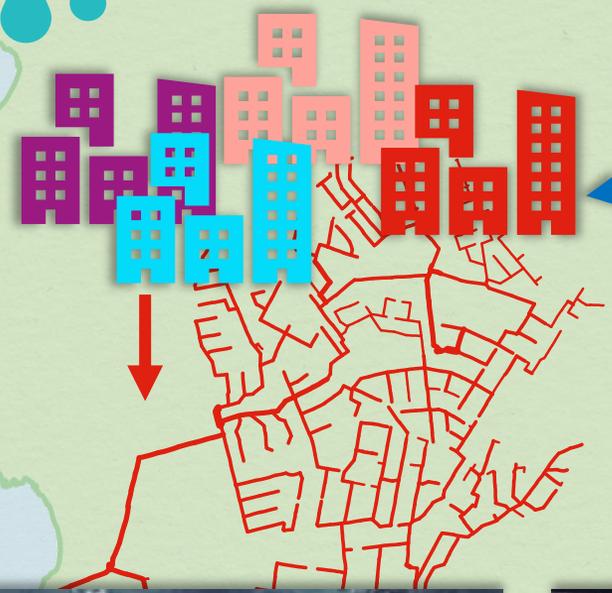
Revolution

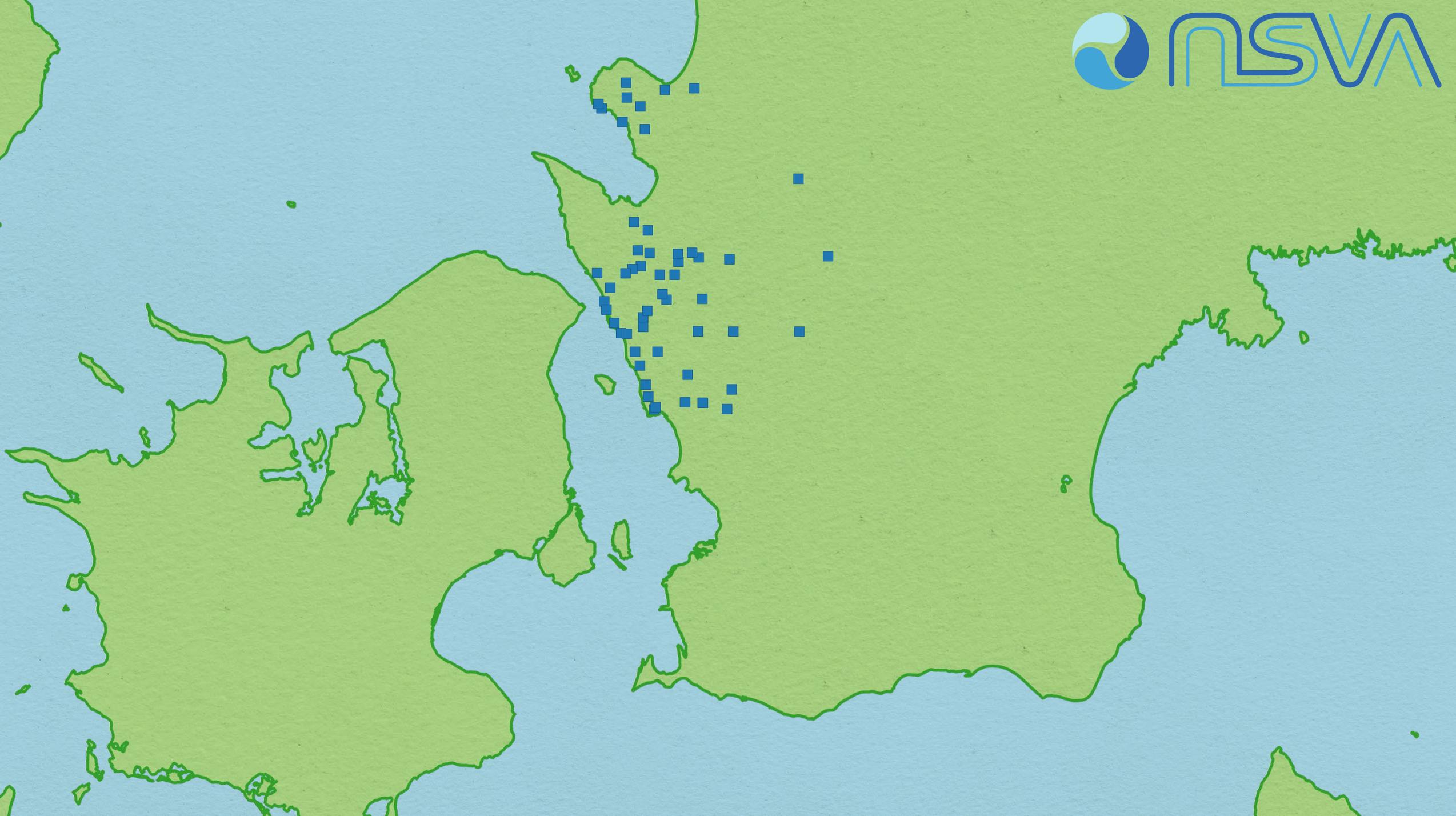
revolution, in social and political science, a major, sudden, and hence typically violent alteration in government and in related associations and structures. The term is used by analogy in such expressions as the Industrial Revolution, where it refers to a radical and profound change in economic relationships and technological conditions.

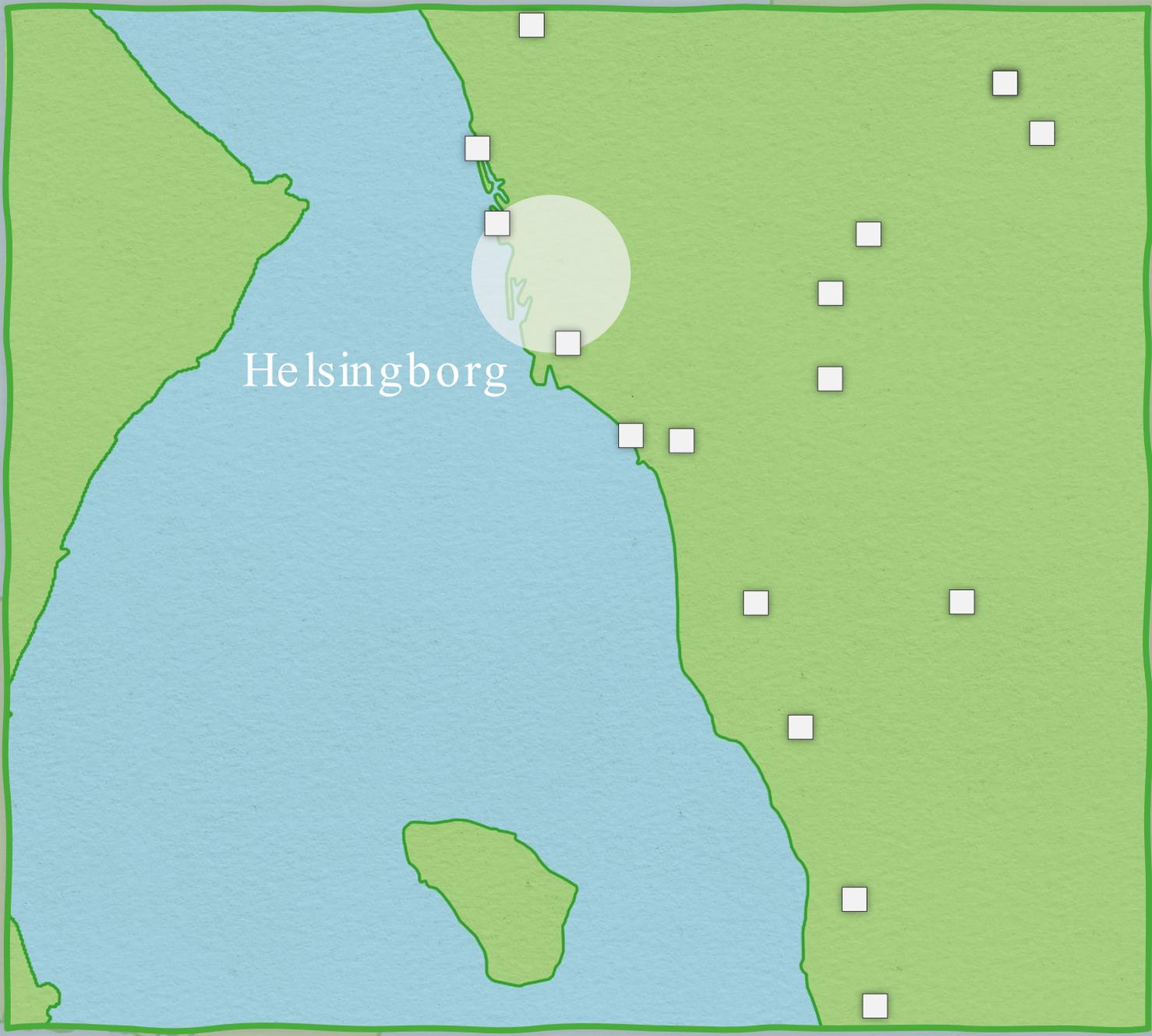


[Reference](#)

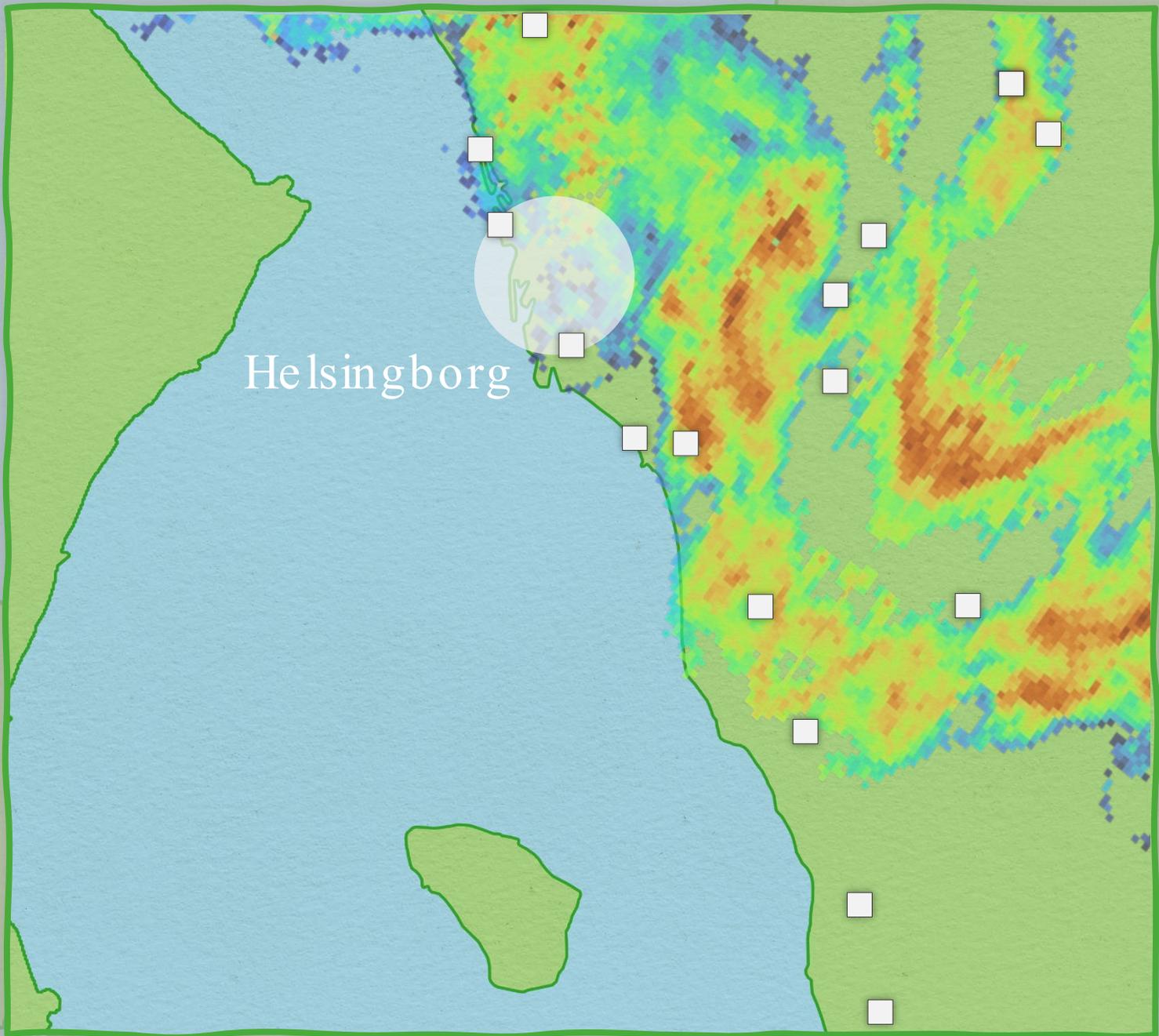




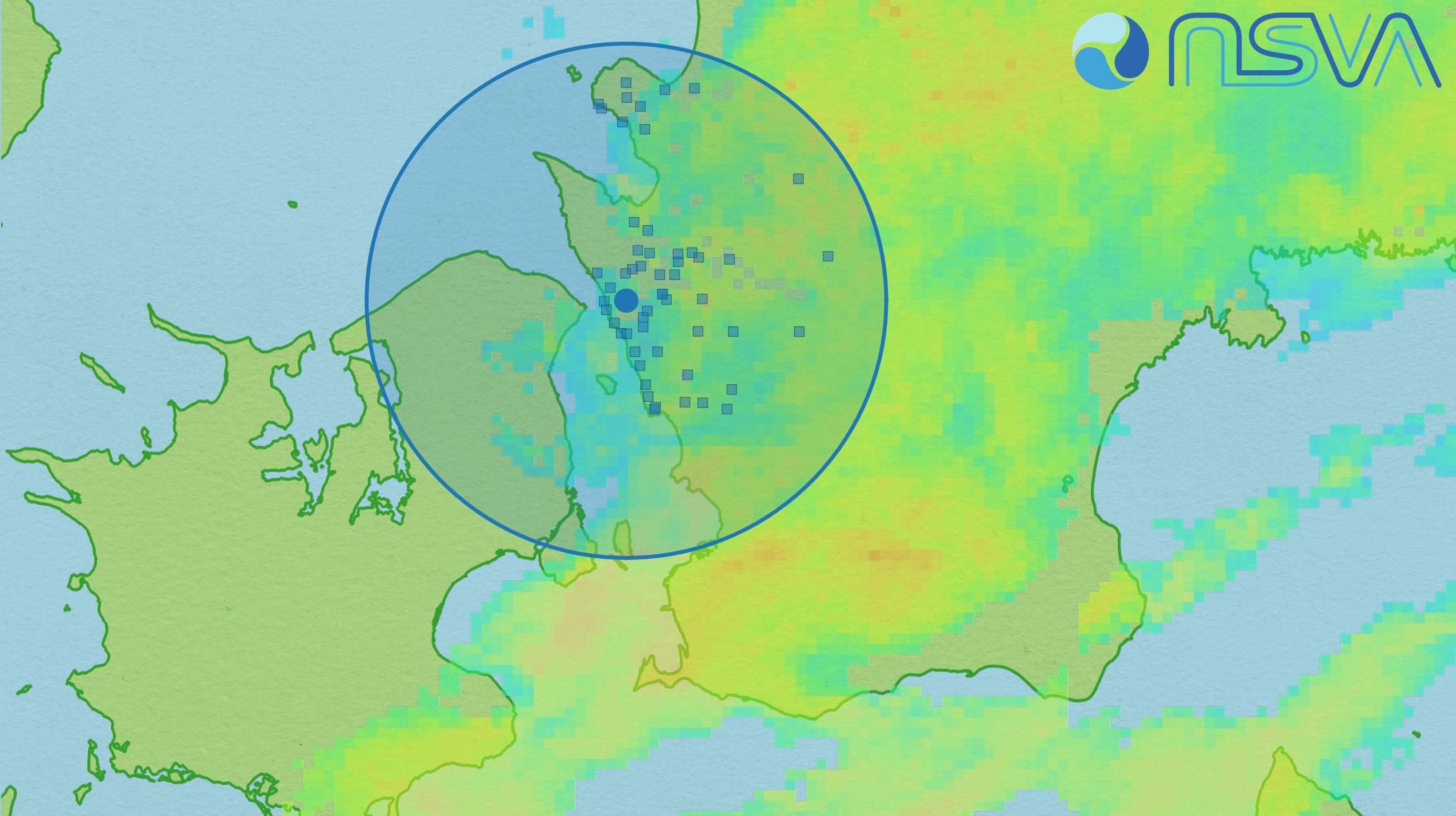




Helsingborg



Helsingborg



Curious about rain

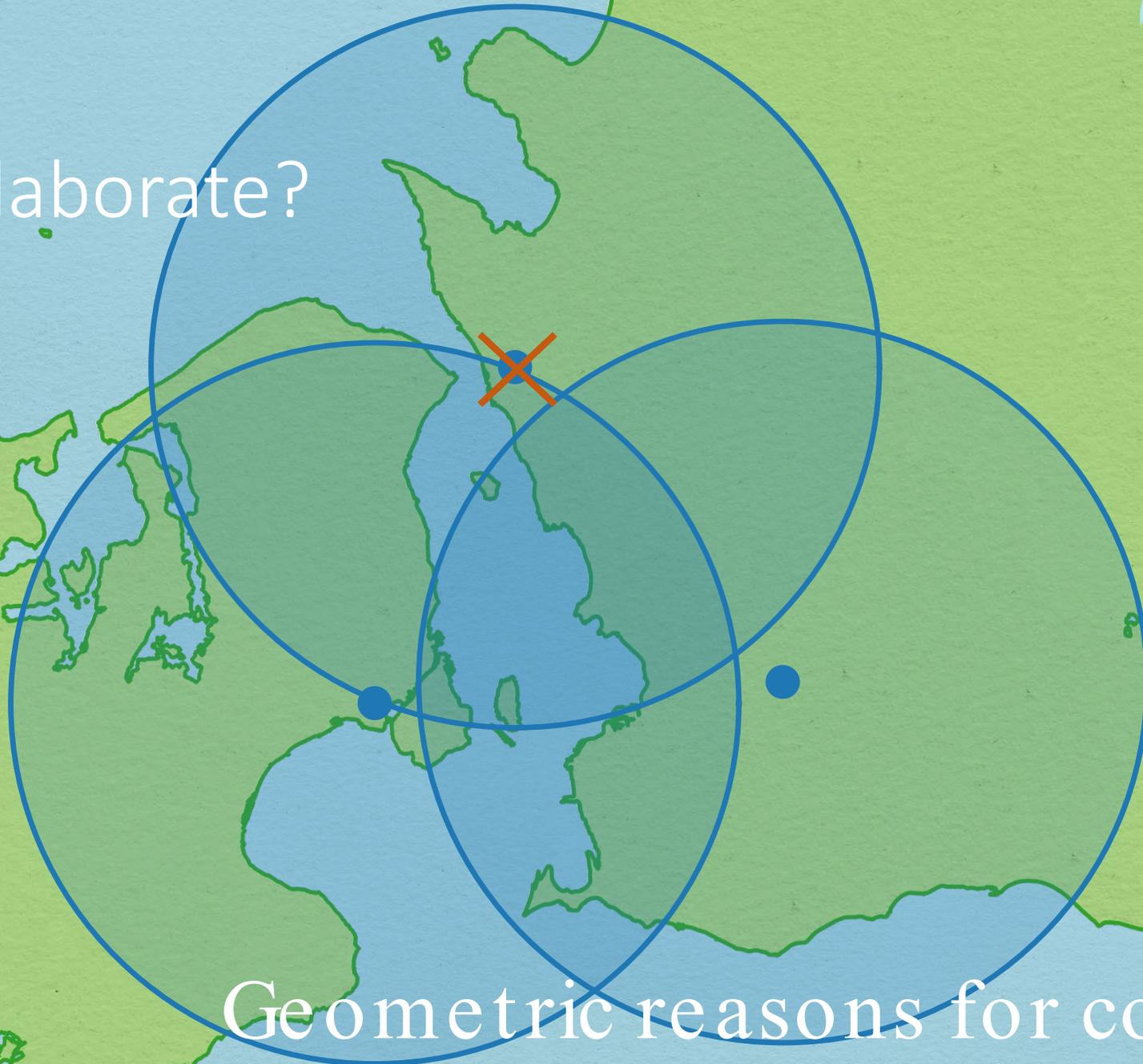


Radar



Filborna water reservoir

Why collaborate?



Geometric reasons for collaboration

Why collaborate?



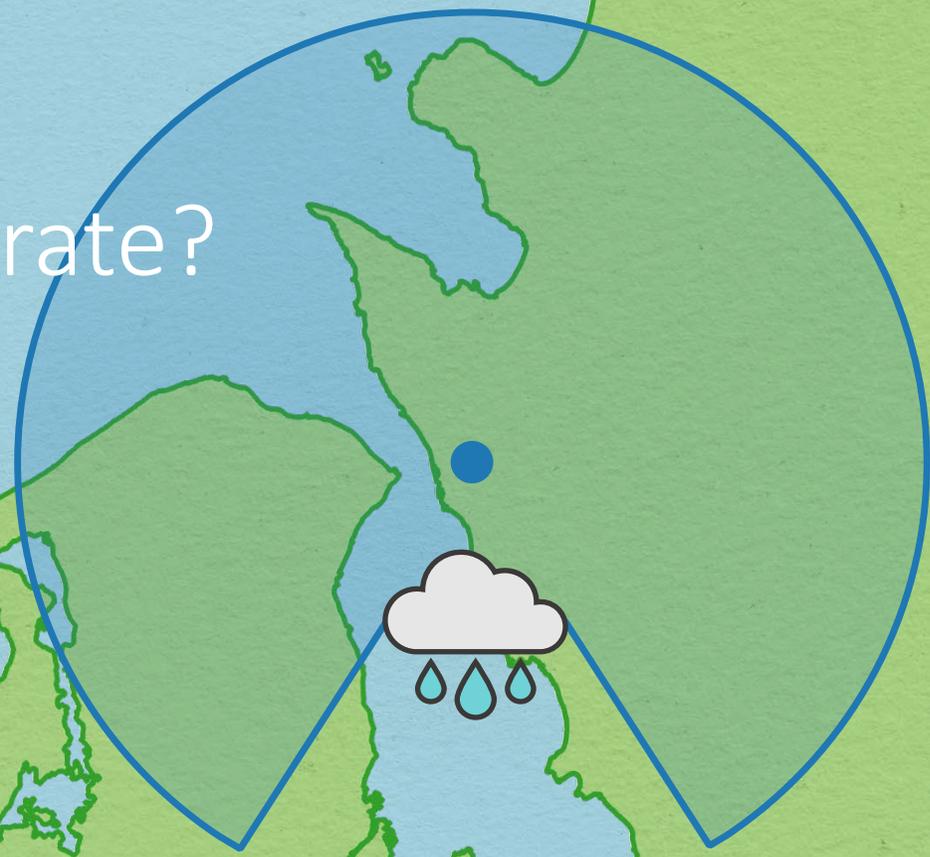
Radar down

Why collaborate?



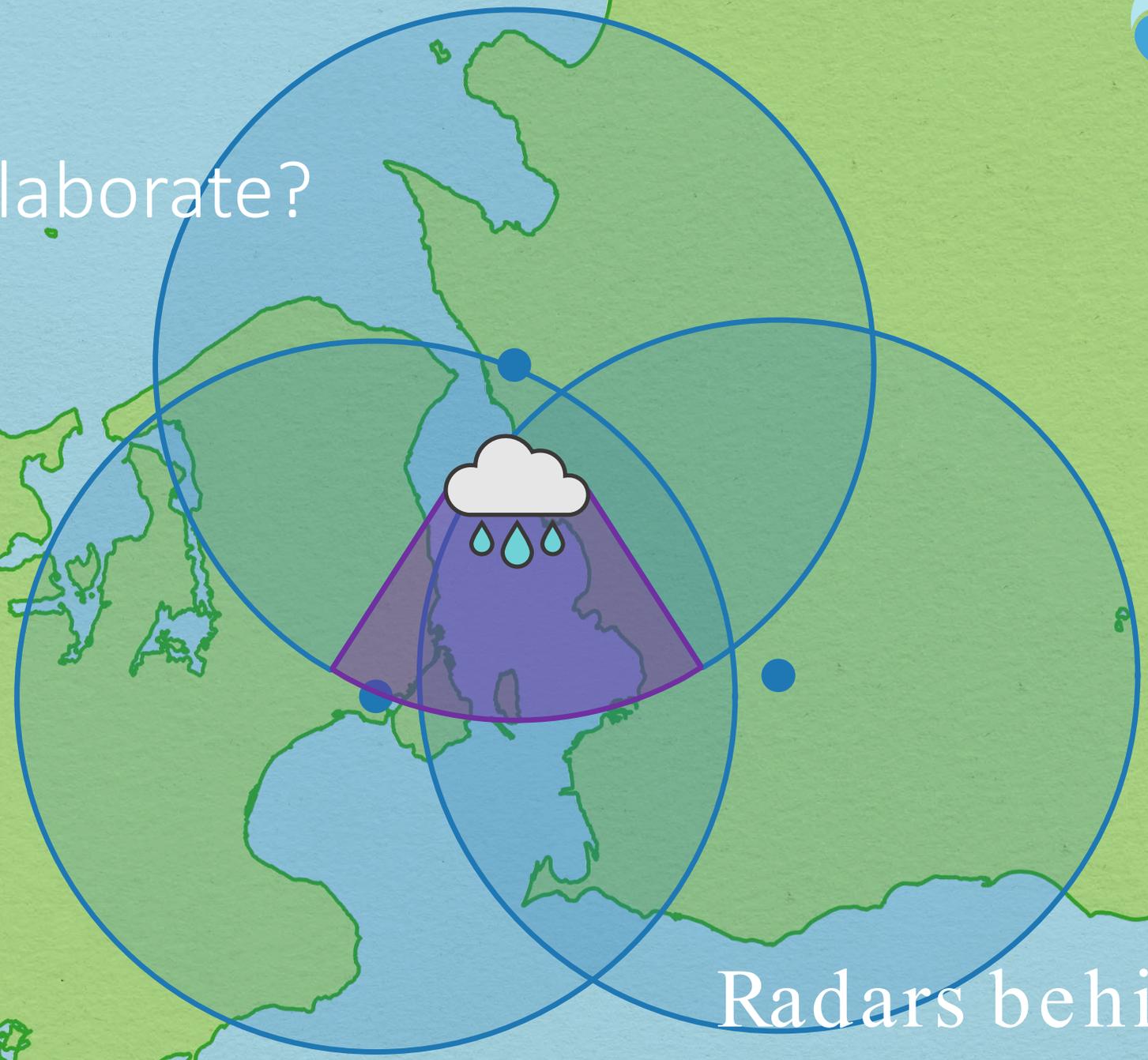
Intense rain

Why collaborate?



Radar shadow

Why collaborate?

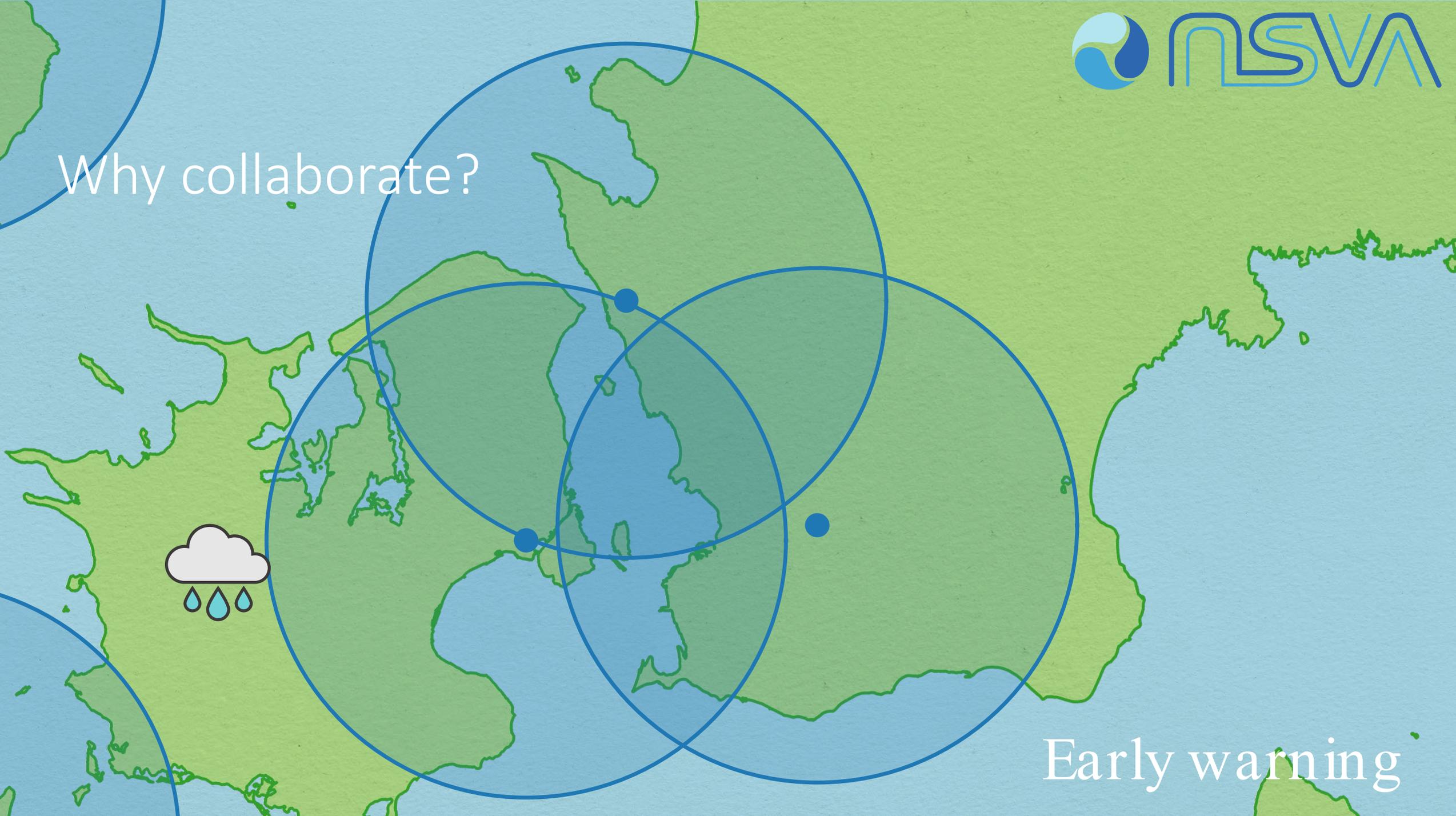


Radars behind the cloud

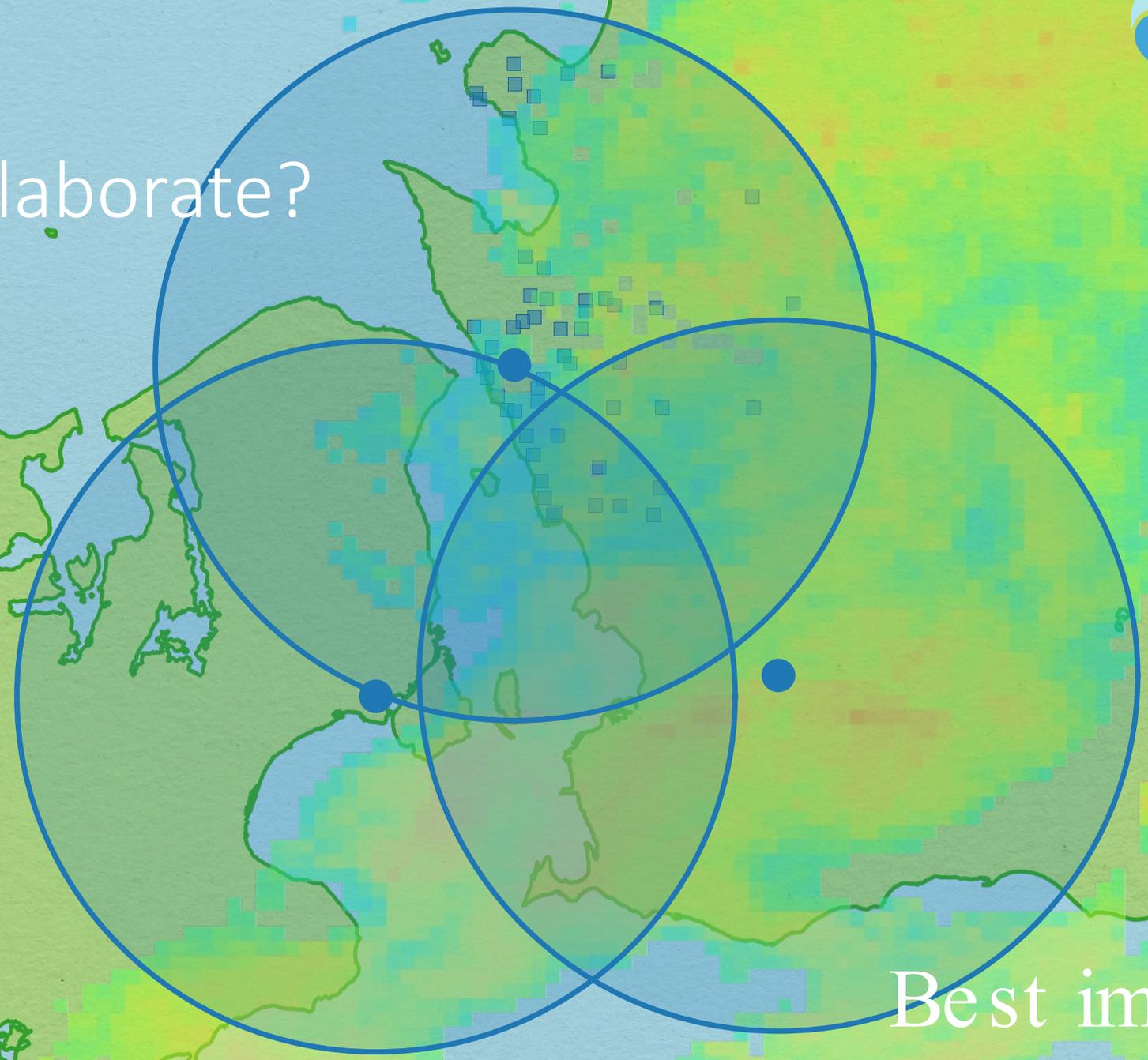
Why collaborate?



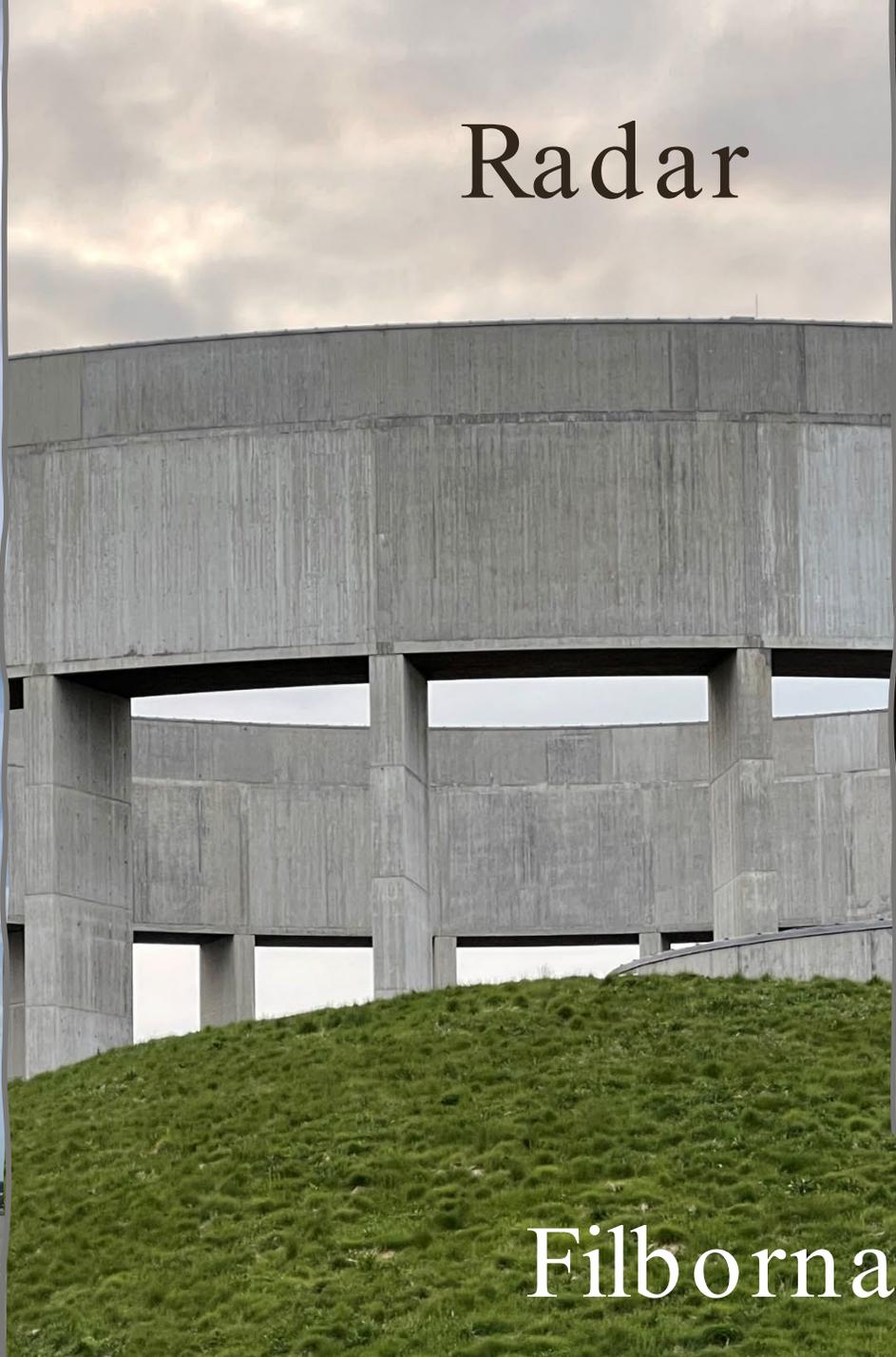
Early warning



Why collaborate?



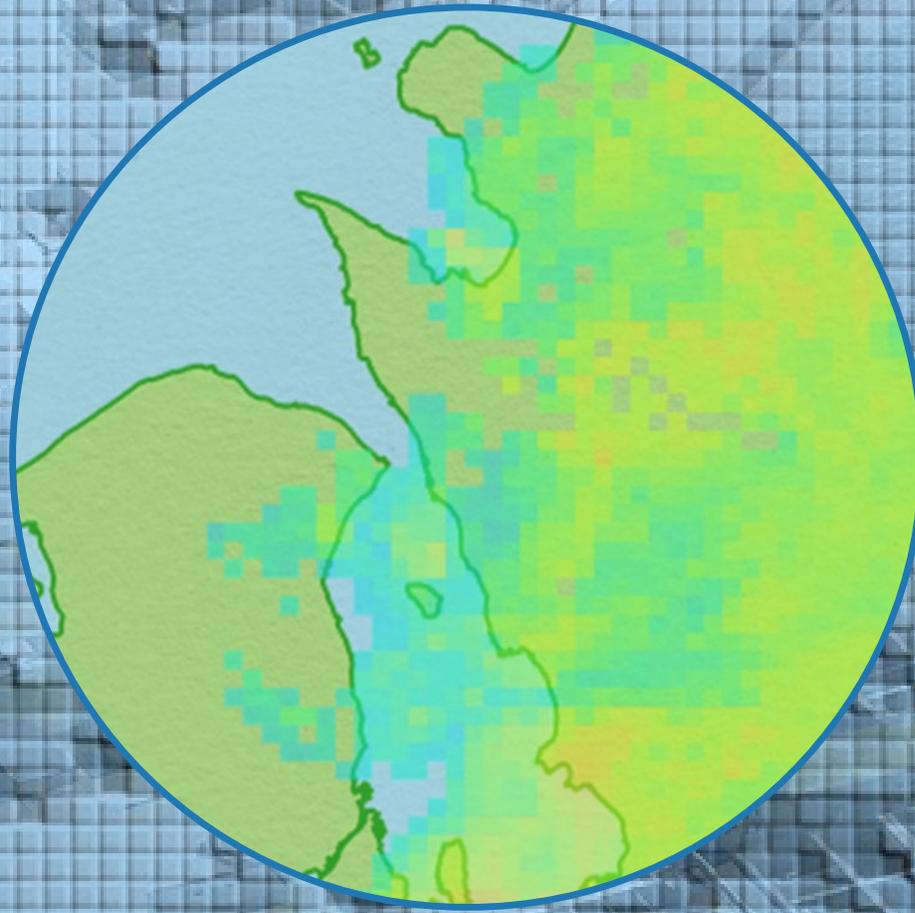
Best image possible



Filborna water reservoir

Digital Twin

Rain data



Helsingborg waste water treatment plant

Vision



A composite of our best rain knowlege



Technical reasons for collaboration

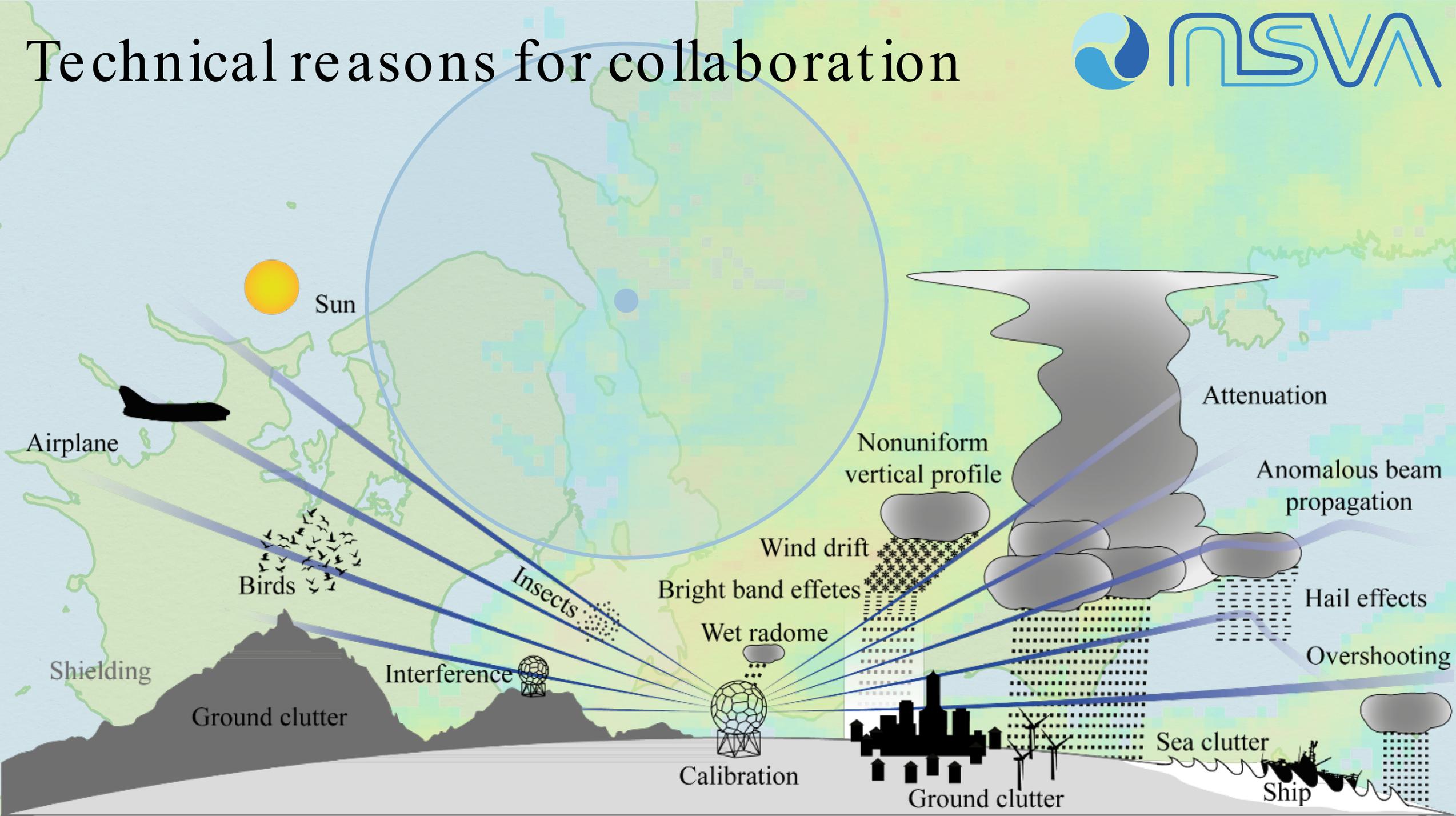


Illustration of the overall data flow

Data flow fra vejradarobservation til bruger applikationer

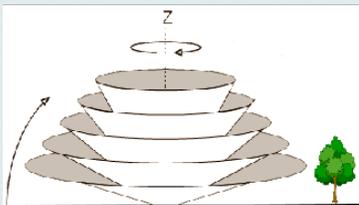
Vejrradardata



S-bånd
SK1000H

C-bånd
WRM200

X-bånd
WR-2100
WR-10x



Data interface
ODIM H5

Data justering og kvalitetssikring

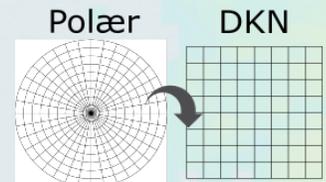
3D - Fysisk datakorrektion

Dæmpnings- VPR Fjernelse af støj og
korrektion korrektion ikke-nedbørs signaler

2D - Projektion og koordinat transformation



Georeferering og
projektion



Polær DKN
Gridding/resampling

Konvertering til distribueret areal nedbør

Bias justering til
jordobservationer

Konvertering fra
reflektivitet [Z] til
regn intensitet [R]



Verifikation og
kvalitetskontrol

Data interface
VeVaDaM H5

Data processing



Eksempler på dataprodukter:

- Forecast
- Prognoser
- Varsling
- Akkumulering
- Radar/NWP assimilering
- ...



Andre datakilder

Satellit

Afstrømnings-
målinger mv.



NWP



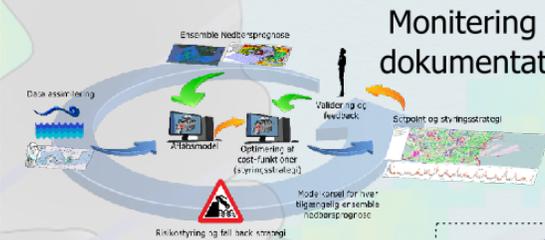
Data interface

Data anvendelse



Simulering og
modellering

- Realtidsmodellering
- Realtidsstyring
- Retrospektive analyser
- Planlægningsanalyser
- ...



Monitering og
dokumentation



Beslutnings-
support

- Myndighed
- Forsyning
- Beredskab
- Planlægning
- Drift
- ...

Tredjeparts
applikationer

VeVa



Vejrradar i
Vandsektoren





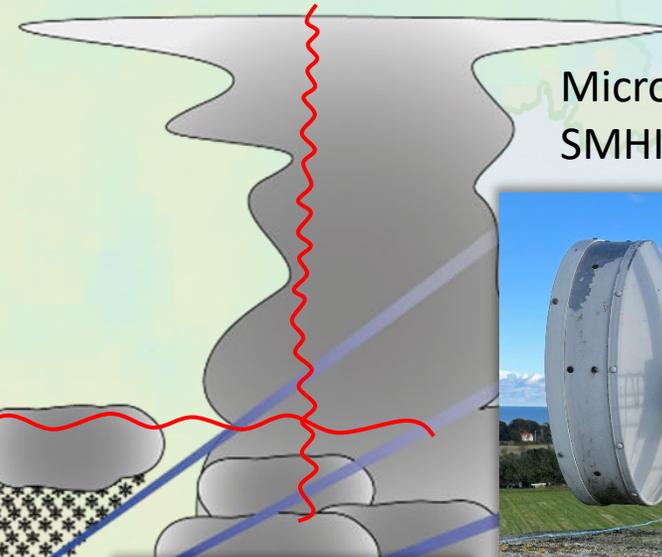
X-band Radar



Distrometer

More ways to measure and collaborate

Microrain radar



Microwave links
SMHI/Ericsson



C-band Radar



Tipping bucket rain gauge



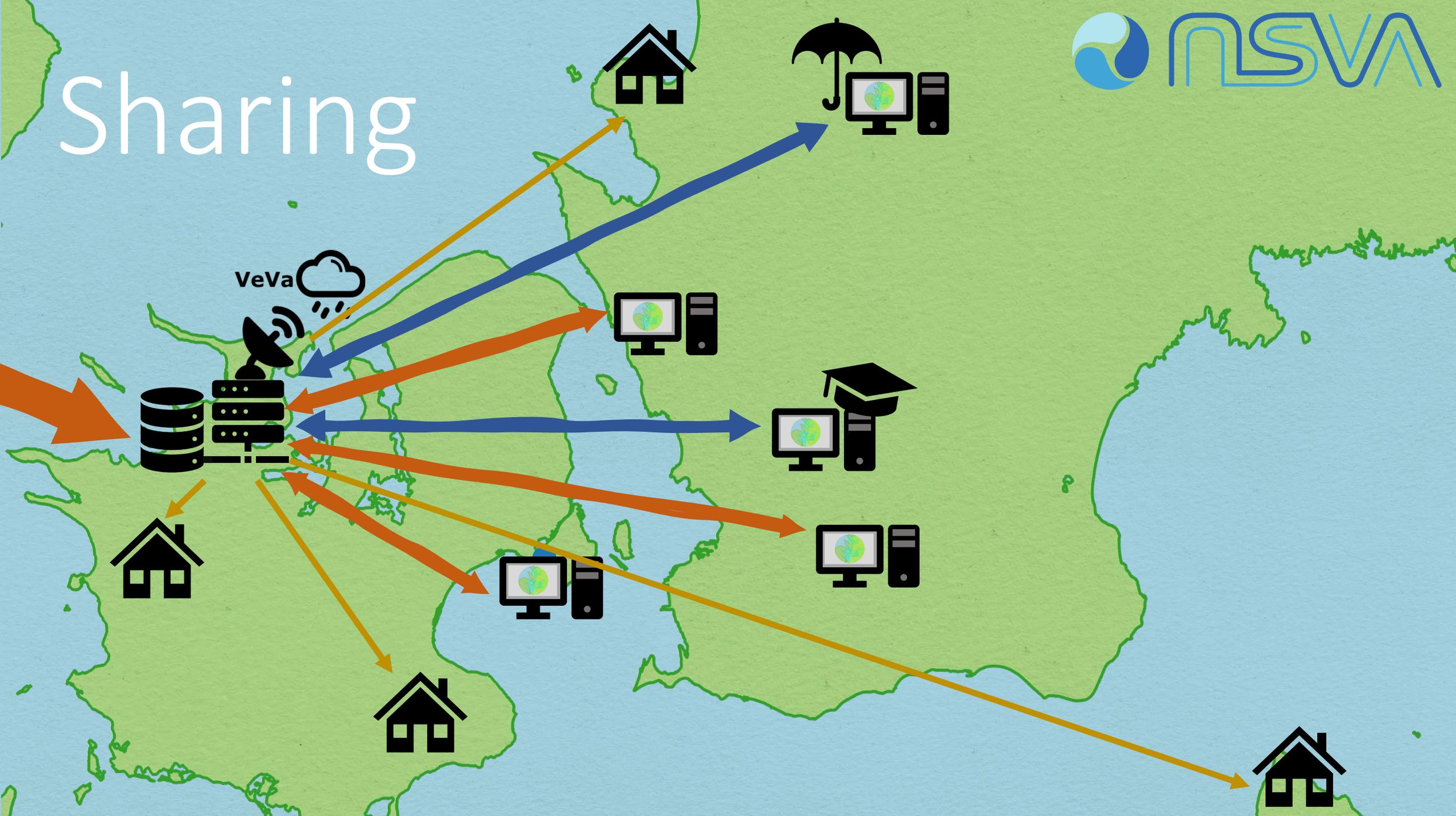
Vision



A composite of our best rain knowlege



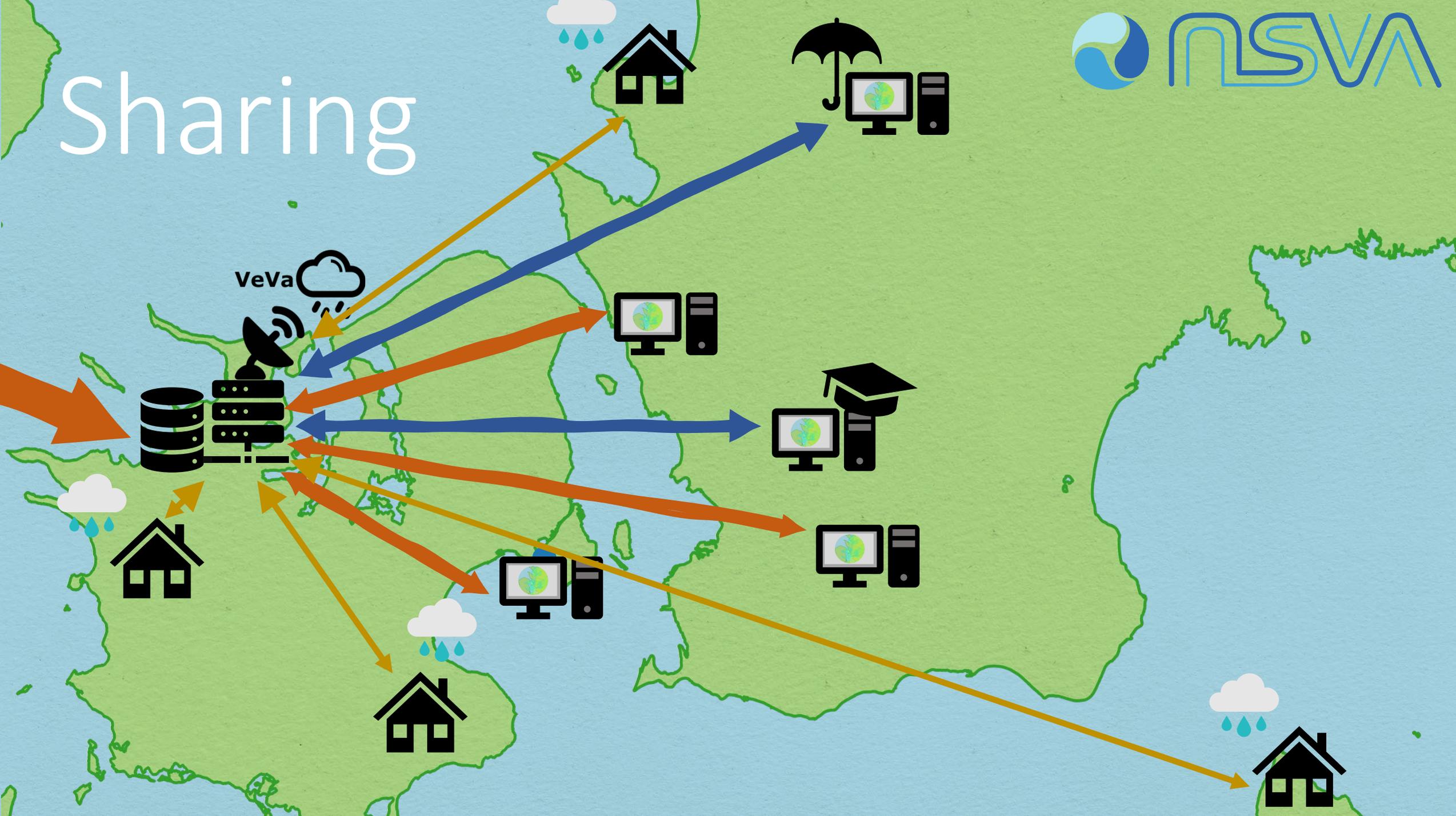
Sharing



VeVa



Sharing



Examples

- Evaluating different data processing for calculating CSO
- Working within the Future City Flow project to create composites and forecasts from our different sources
- Using radar data to do a backward calculation of expected inflow and infiltration in pipe networks



Knowledge of rain is really important



Combining knowledge and resources to implement and operate the necessary technologies enables us to **reach our vision** of “a composite of our best rain knowledge” earlier.

Solid and **available data** lowers thresholds for **utilisation and research** going forward.

Cross border collaboration For The Win!





Thank you
Andreas & Sven

