

EnviSuM

Environmental Impact of Low Emission Shipping: Measurements and Modelling Strategies

Event: EUSBSR seminar

Place: Date Oslo 6. February 2018

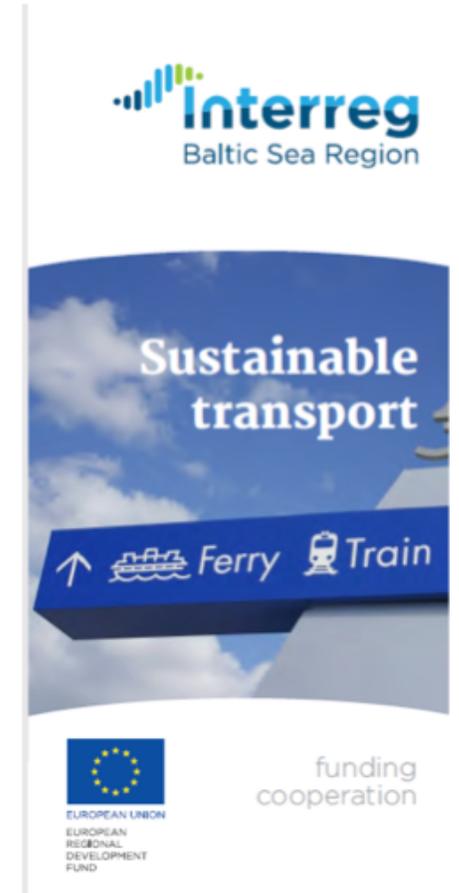
Name: Jan Eiof Jonson



EnviSuM

Environmental Impact of Low Emission Shipping: Measurements and Modelling Strategies

- Programme priority: 3. Sustainable transport
- Programme specific object: 3.4 Environmentally friendly shipping
- Project budget 3,2 million euros
- Duration of implementation phase 36 months
- 12 project partners from seven countries
- 17 associated partners from seven countries

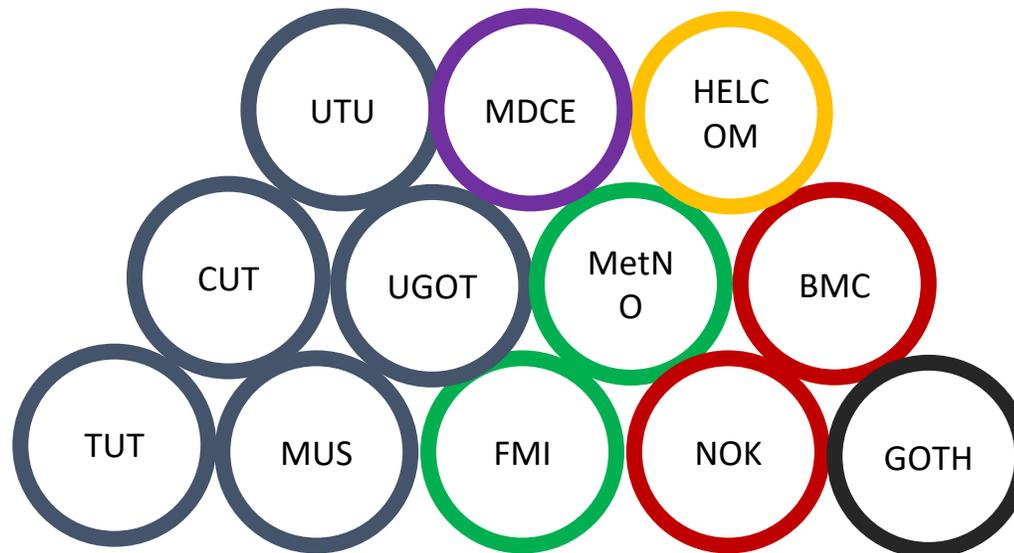


Programme area



■ EU Member States
■ non-EU States

Multidisciplinary Consortium



universities

research organizations

business support organization

private sector

NGO

city administration

+ 17 associated organisations, including Russian partners

WP 2 – Emissions and abatement strategies

What?

- Detailed emission data of sulphur, NOx and particles
 - Fixed site measurements
 - Two flight campaigns
 - On board measurements (ships utilizing scrubbers, LNG fuel)

What for?

- To validate ship emission modelling in relation to compliance with sulphur regulation
- To improve modelling tools regarding the impact of alternative fuels (LNG, methanol, biofuels) or emission abatement techniques (SOx scrubbing)

To whom and why?

- Occasions
 - A seminar/workshop for key stakeholders to clarify the expectations for the project
 - A study trip to increase the knowledge of stakeholders of clean shipping technology

WP 3 – Air Quality and Deposition

What?

- Assessing the effects of ship emissions (data from WP2) on air quality and depositions before and after the implementation of the sulphur regulation

Where?

- European scale, but focus on the Baltic Sea region
- Urban scale model calculations for three cities/urban regions (Gothenburg, Gdansk and St. Petersburg)

What for?

- Model calculations and measurements -> gridded concentrations and depositions -> calculations of the effects on human health and the environment under present and also under future (2020 and 2030) conditions

WP 4 – Social and Political Impact

What?

- Quantifying of effects of air pollutant emissions from ships (data from WP3 and up-to-date methods)
 - Human health: the health impact assessment couple emission data with geocoded residential addresses of the relevant population
 - Environment: acidification and eutrophication both on water and land (crops and forests)
 - Especially effects of NO_x to eutrophication and acidification is evaluated

Where?

- In three port cities
- On regional scale: the whole Baltic Sea region

What for?

- Estimations of improvements due to SECA and possible NECA regulations -
> are the regulations effective in achieving their aims

To whom?

- The recommendations for policy makers stemming from the project findings

WP 5 – Economic Impact

What?

- Assessment of costs and benefits of SECA/NECA regulations
- Evaluation includes emission abatement costs, administrative burdens, changes in modal split and socioeconomic impacts related to health and environment

How?

- Guidelines regarding SECA consist of 4 parts
 - investment analysis (i.a. surveys, case studies, interview, study trips)
 - administration cost/benefit analysis on micro and macro level
 - logistics cost/benefit analysis, SECA impact on changes of transport patterns and modal flows
 - socio cost/benefit analysis, health and environmental impact of SECA regulations (data from WP4)

What for?

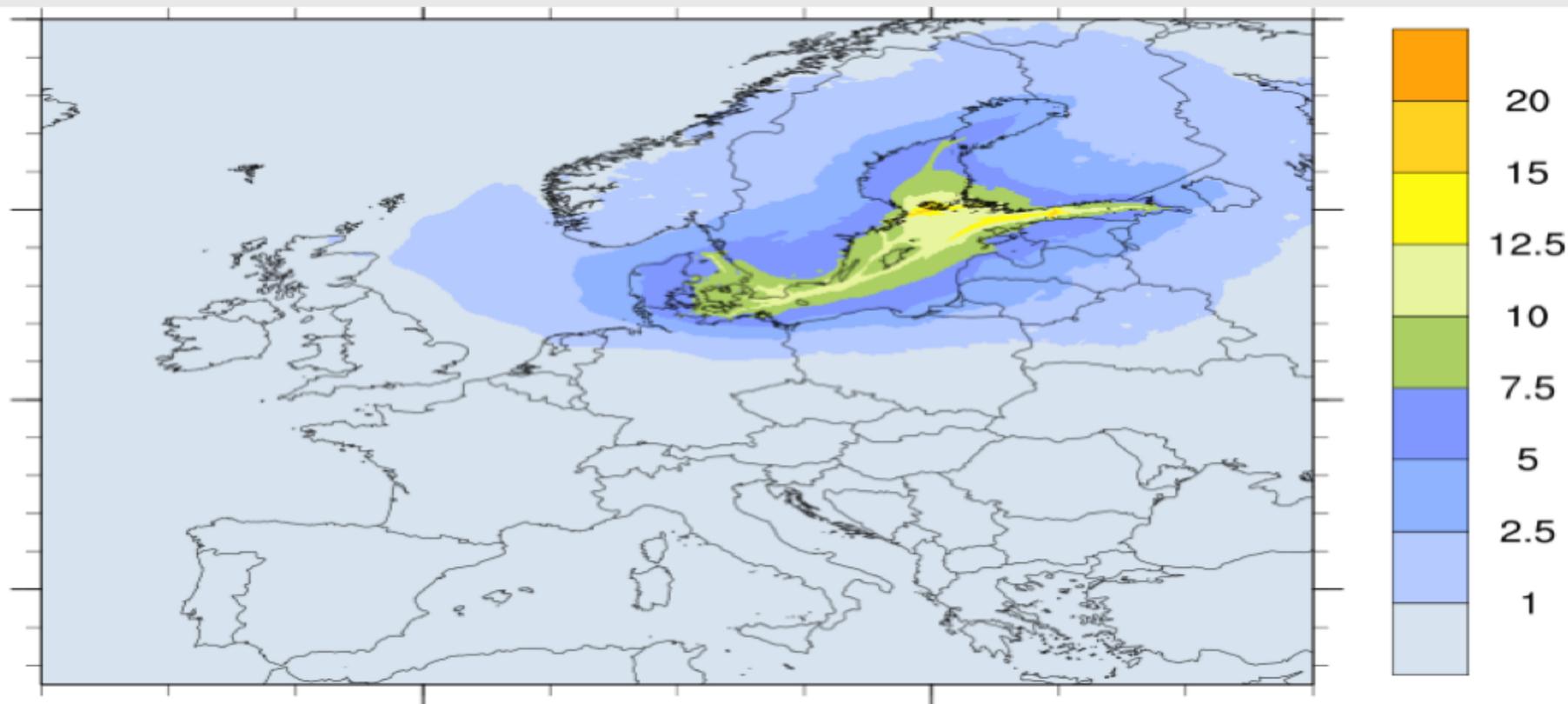
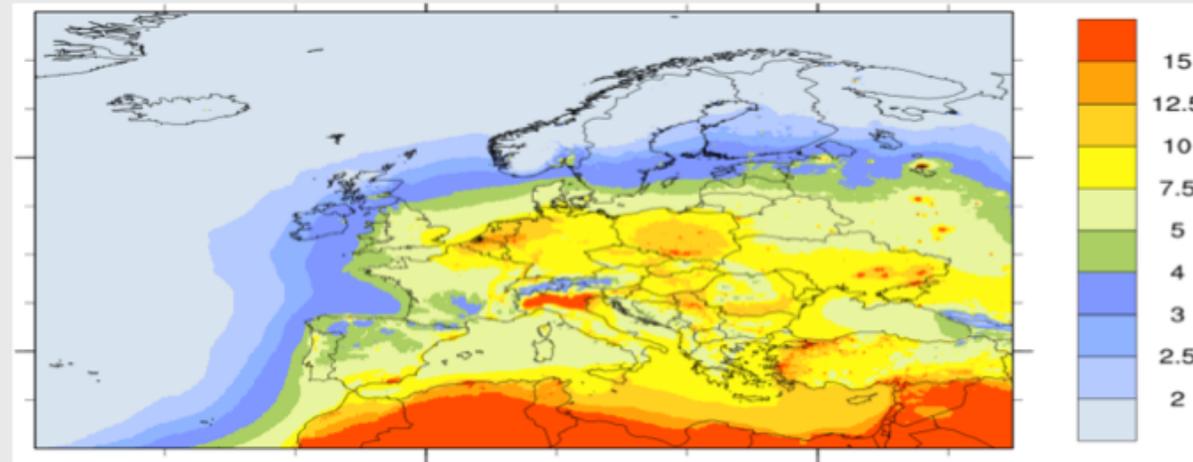
- The results of the activities will be compiled to "Economic Guidelines for SECA" comprising policy and business recommendations and an economic decision tool

Activities in WP3

- A3.1** Regional model calculations (lead: MET Norway, start: P2)
- A3.2** Urban modelling pilot studies
(lead: City of Gothenburg, start: P4)
- A3.3** Urban measurements (lead: FMI, start: P1)
- A3.4** Model/measurement intercomparisons
(lead: MET Norway, start: P3)
- A3.5** Future scenarios for air pollution/depositions in the BSR
(lead: MET Norway, start: P4)
- A3.6** Impacts of Clean shipping for Baltic Cities and Ports
(lead: MDCE, start: P2)

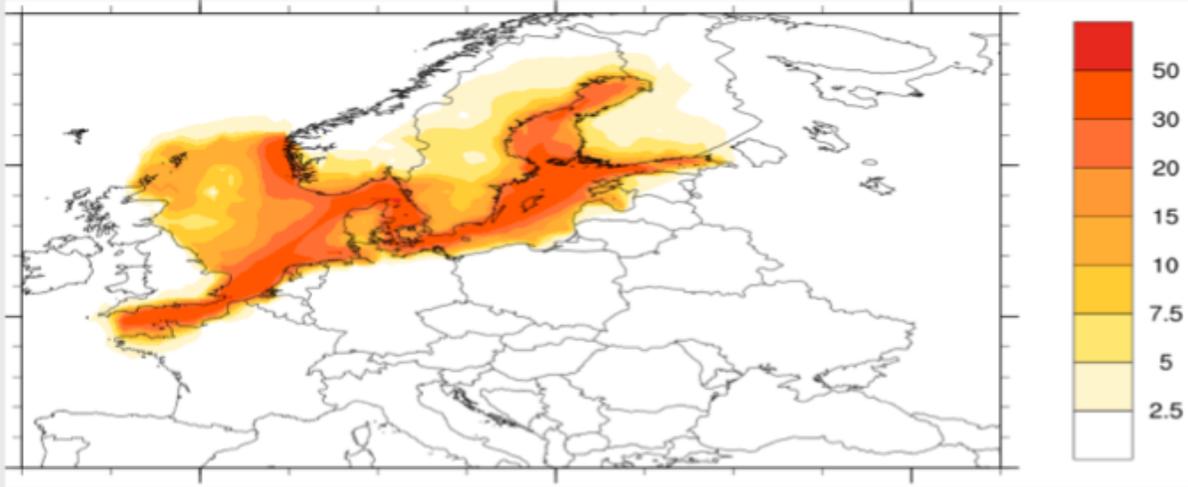
Model runs with 2014 emissions
(Met. 2014 - 2016)
with/without Baltic Sea
emissions

PM2.5

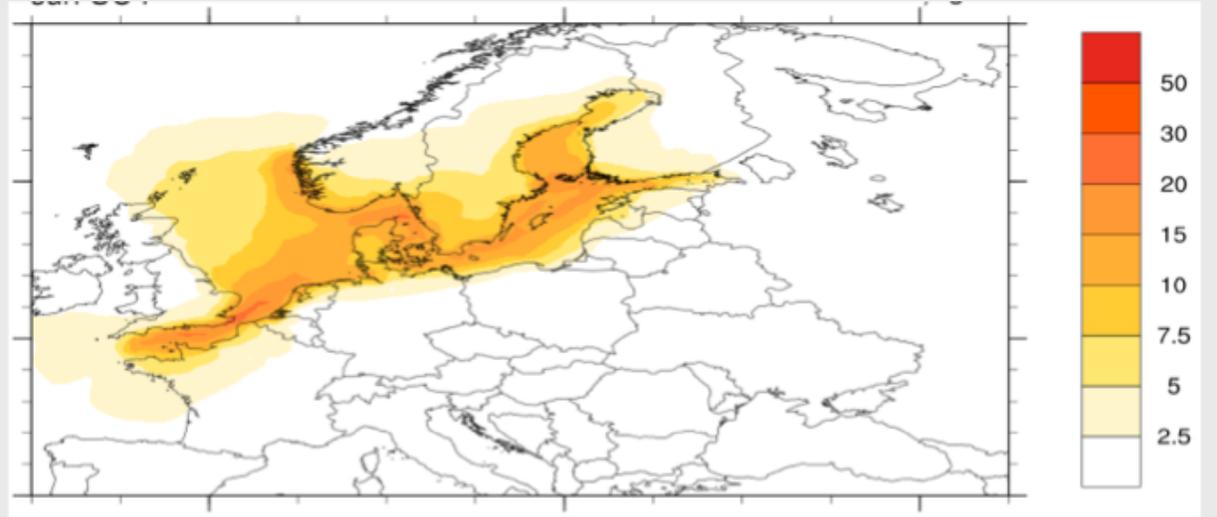


Percentage contribution from the Baltic Sea

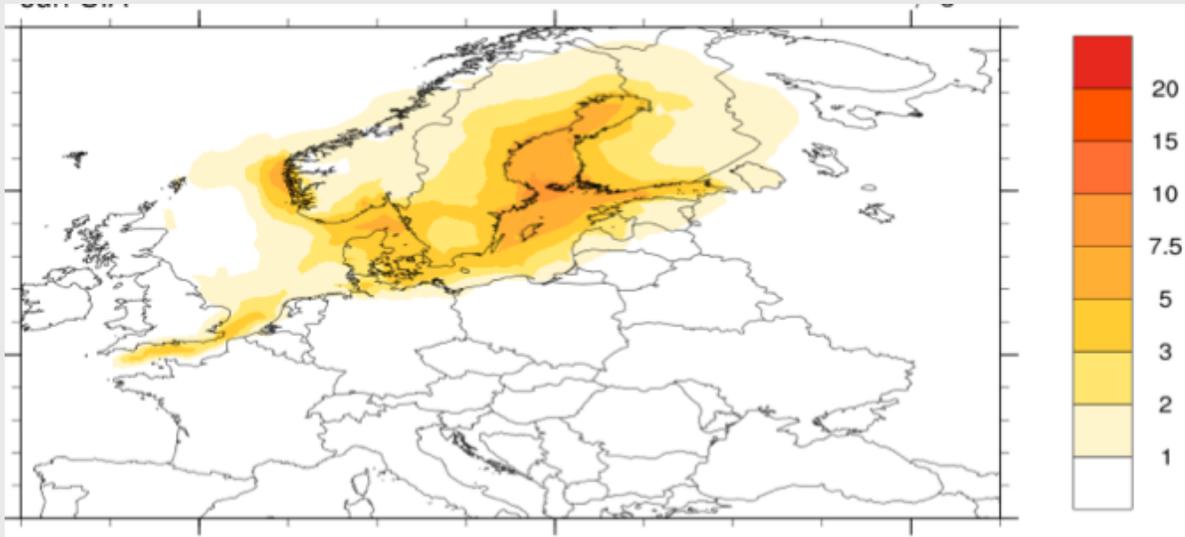
SECA 2015. Pollution avoided



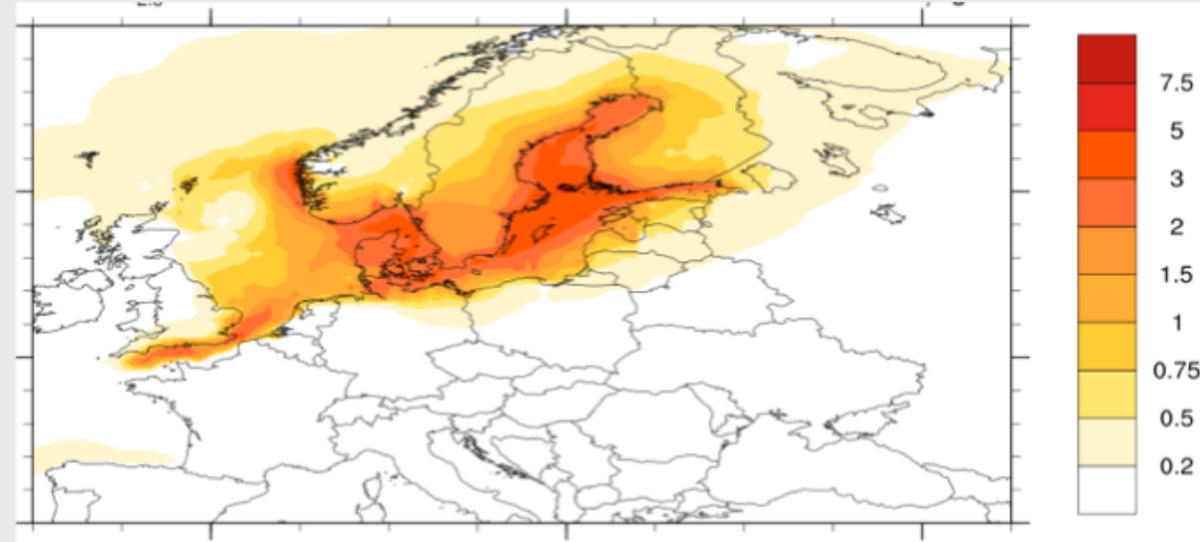
SO₂



SO₄



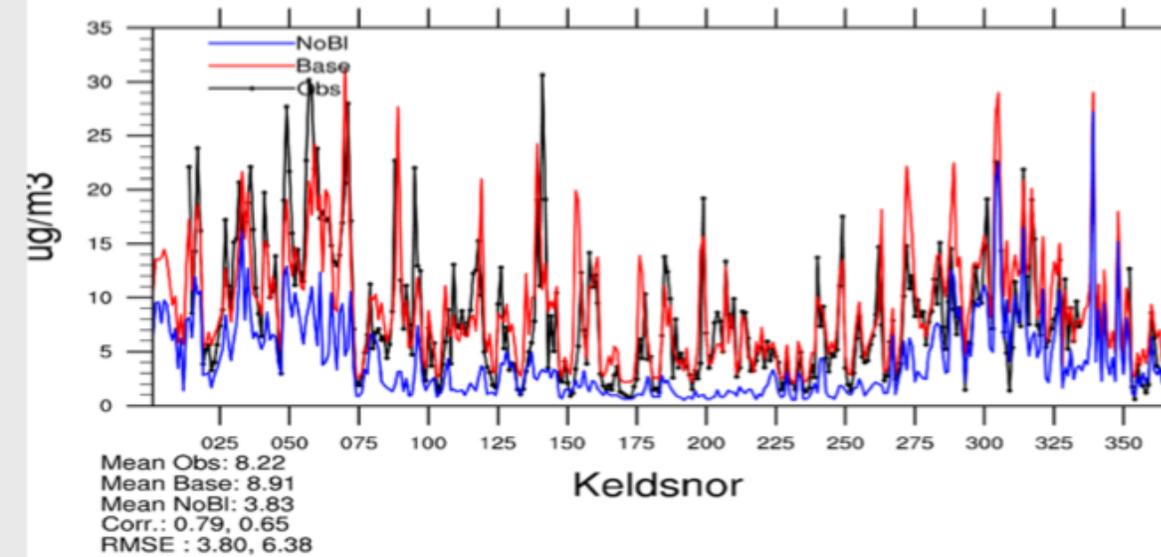
SIA



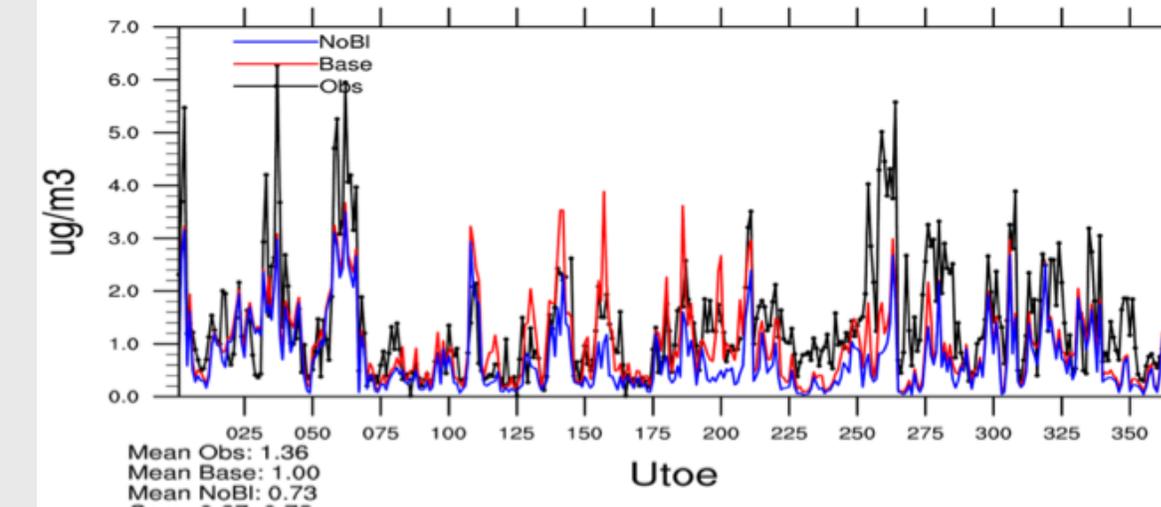
PM_{2.5}

Can we see these effects in the measurements?

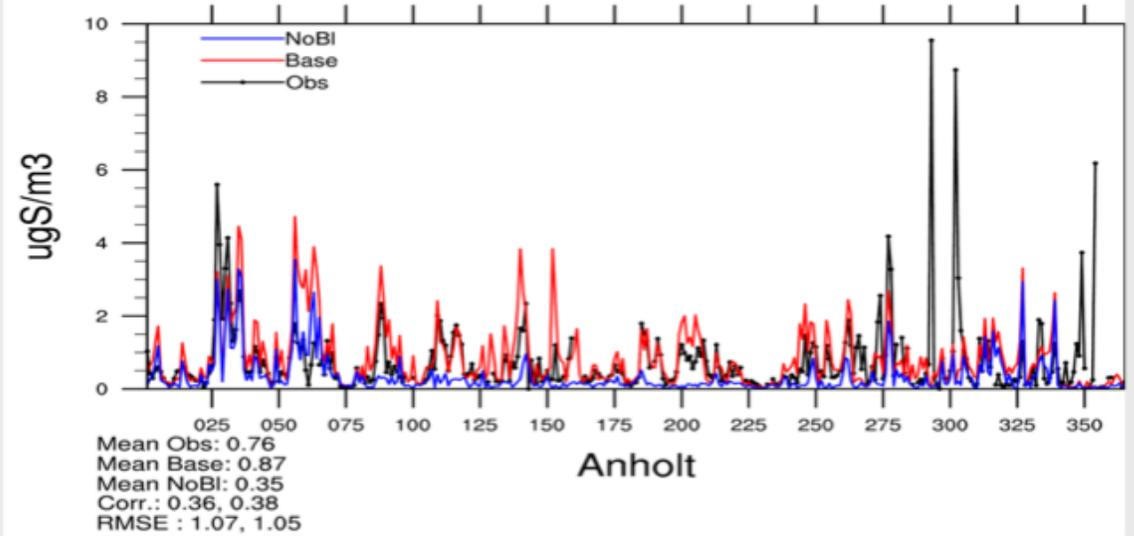
NO2 in Air



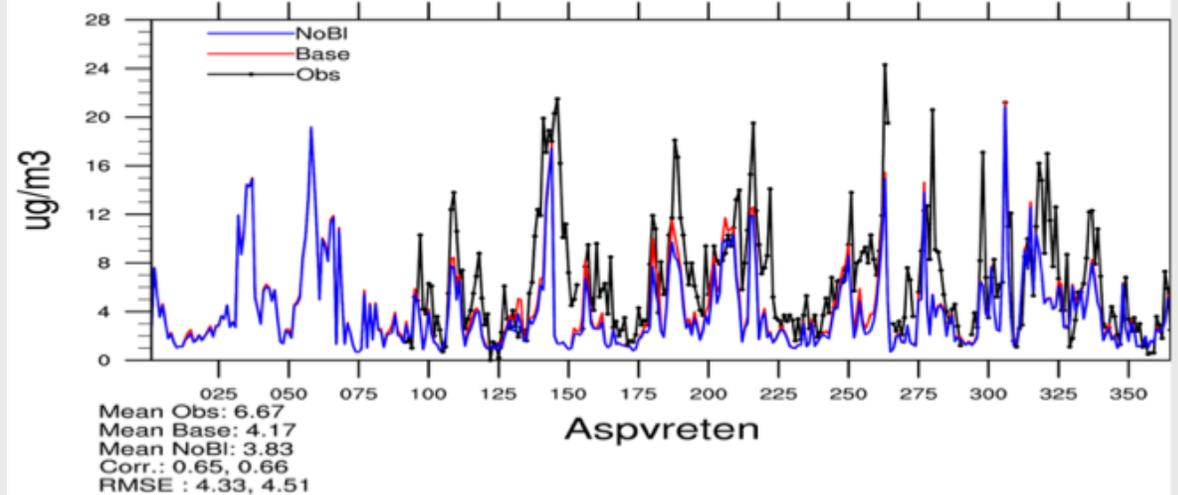
Sulfate in Air



SO2 in Air



PM2.5



Personal experiences from EnviSum (and InnoShip)

- Pro:
 - Very relevant subject
 - Good partners
 - We get access to data that has proven very useful for other projects
 - Transfer of knowledge
- Con:
 - High own contribution (50%)
 - Lots of paperwork (but not as bad as previous BSR projects)
 - Frequent audits implying substantial administrative work (and cost)

Thank you for your attention

FUTRHER INFORMATION

Jan Eiof Jonson
Norwegian Meteorological Institute
E-mail: j.e.jonson@met.no

or:

Project Manager, PhD Sari Repka
Head of Unit
University of Turku, Finland
Tel. +358-40-8019206
E-mail: sari.repka@utu.fi

