Climate Change

Copernicus Regional Reanalysis for Europe

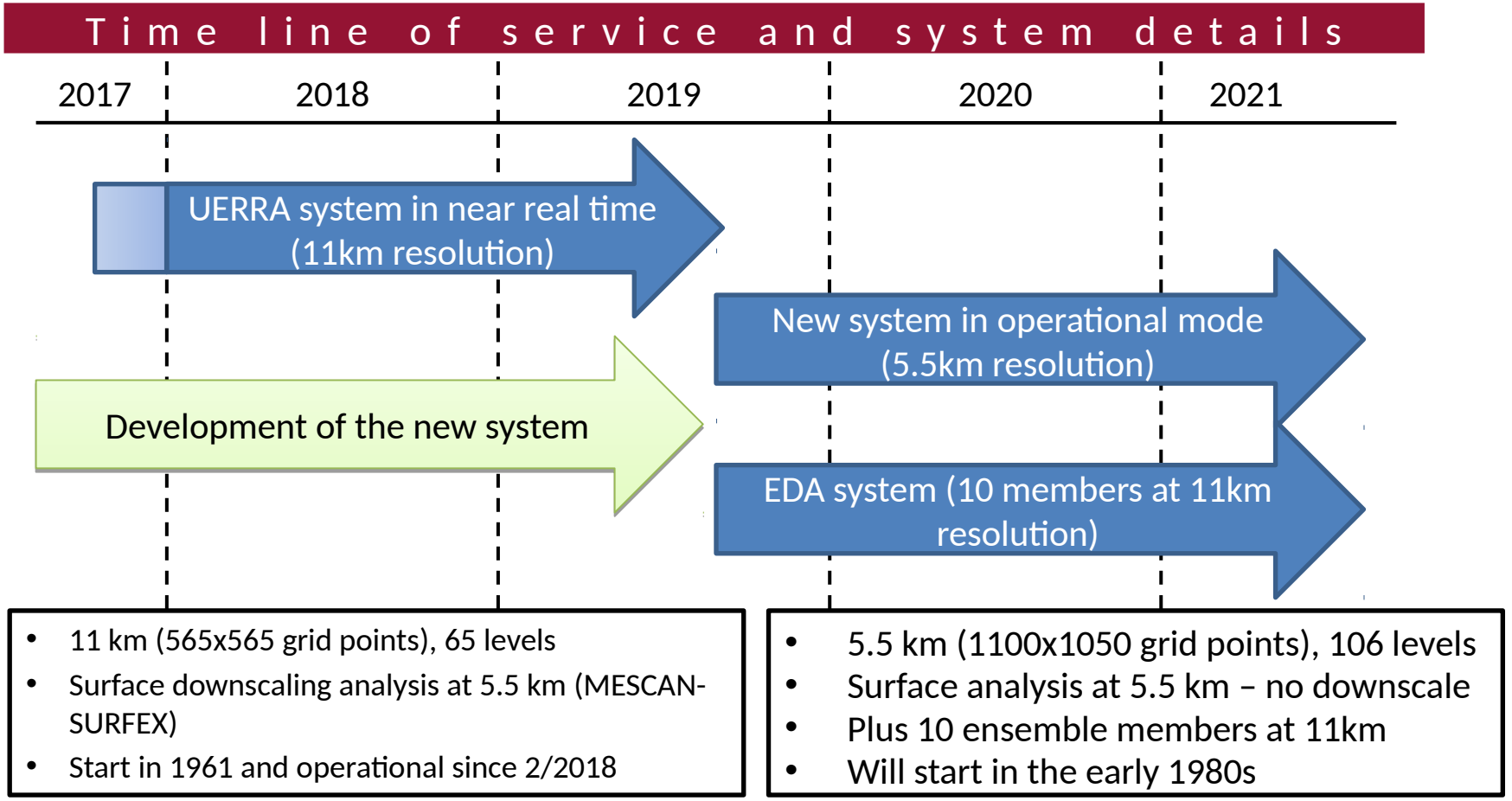
Thanks to Semjon Schimanke for providing the slides

Copernicus Europe's eyes on Earth

European Commission

ECMWF

SMHI



Contact:
copernicus-support@ecmwf.info

Available time steps

		1978-12-02							1978-12-03																							
Forecast starting at		17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3
1978-12-02	0 UTC																																			
1978-12-02	6 UTC																																			
1978-12-02	12 UTC																																			
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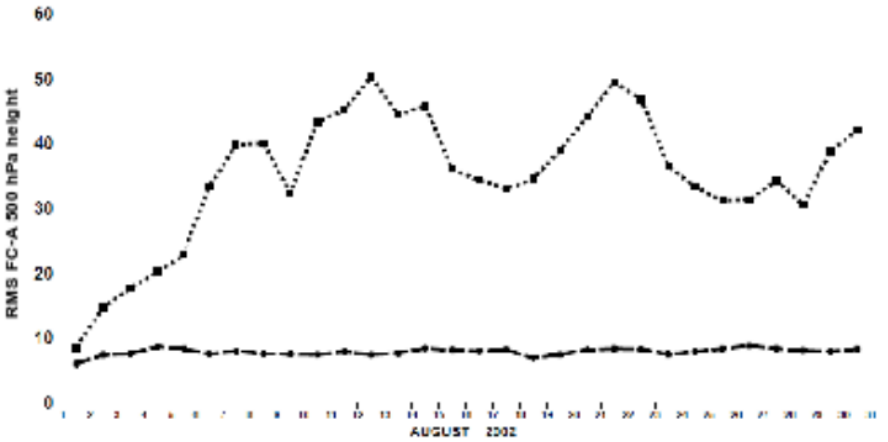
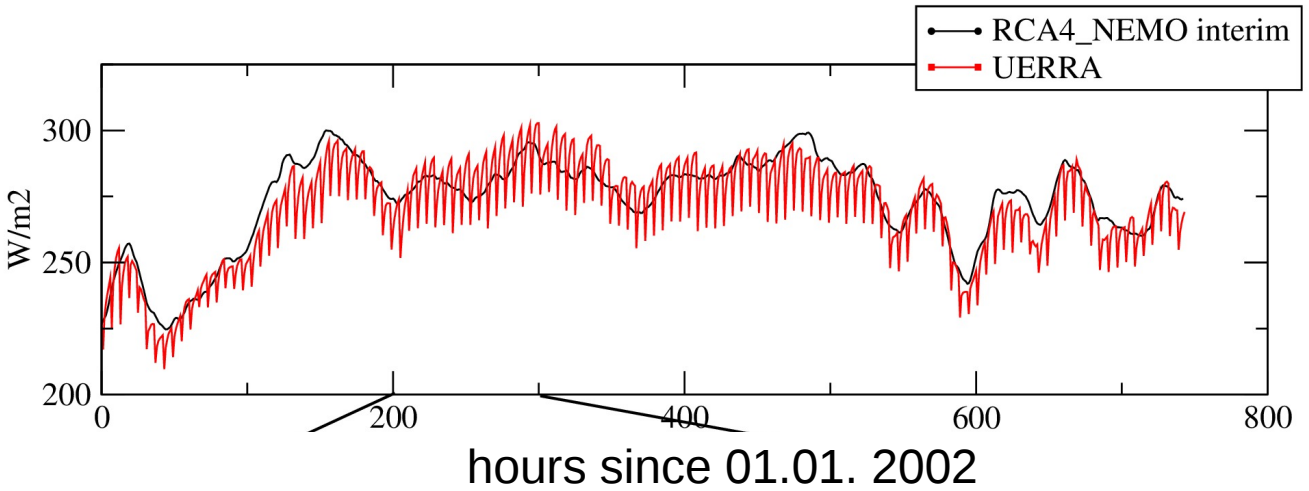
1978-12-03	0 UTC																																			
1978-12-03	6 UTC																																			
1978-12-03	12 UTC																																			
1978-12-03	18 UTC																																			
1978-12-04	0 UTC																																			
Number of available time steps									4	1	1	2	1	1	4	1	1	3	1	1	4	1	1	2	1	1	4	1	1	3	1	1				

- 4 analysis per day
- Hourly resolution from the forecast model
- Maximum forecast lengths is 30 hours
- Up to four valid time steps at a certain time



Bias in height 500 hPa level

avergae LW down betwen 4-25 E; 50-66 N



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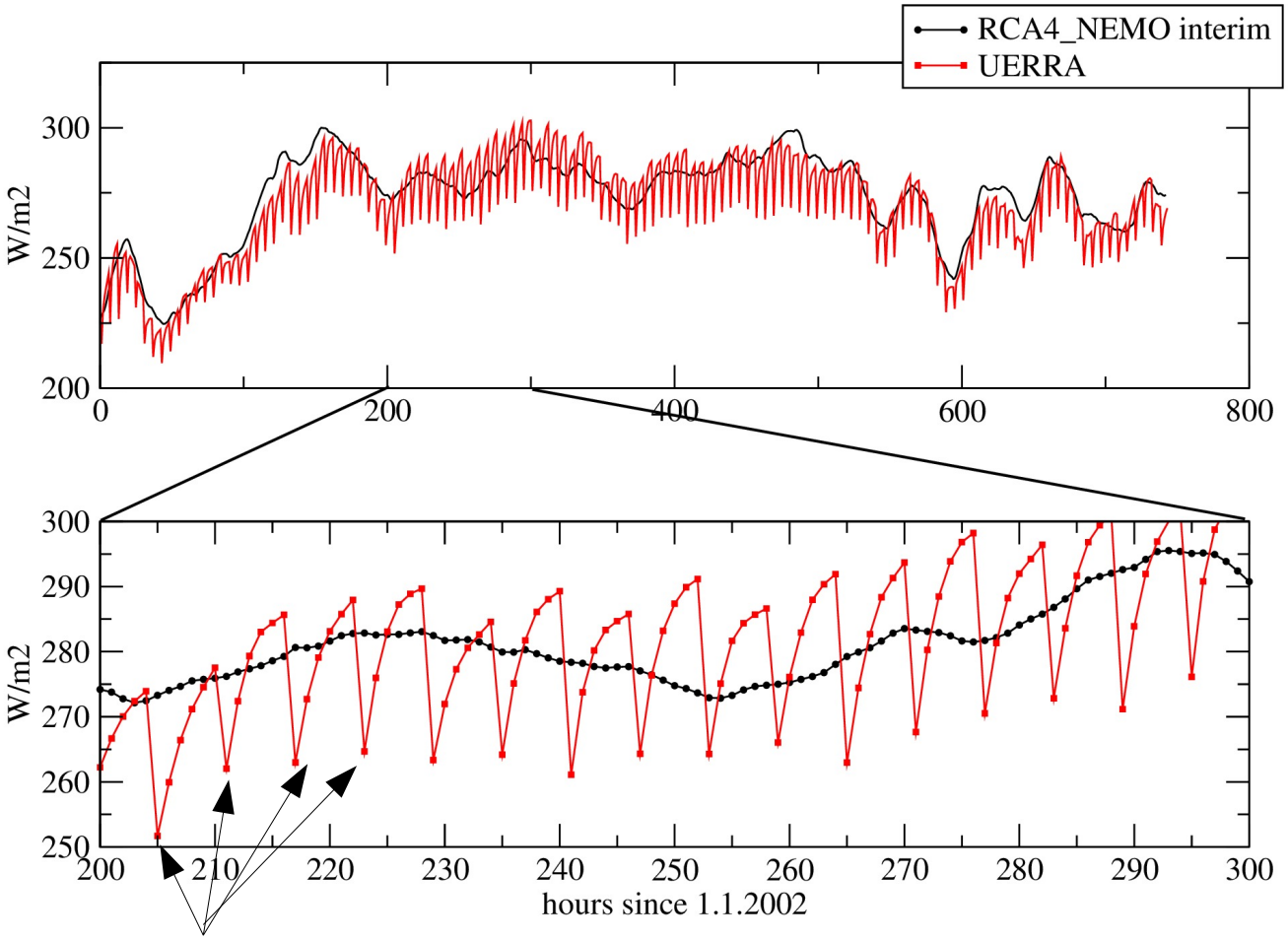


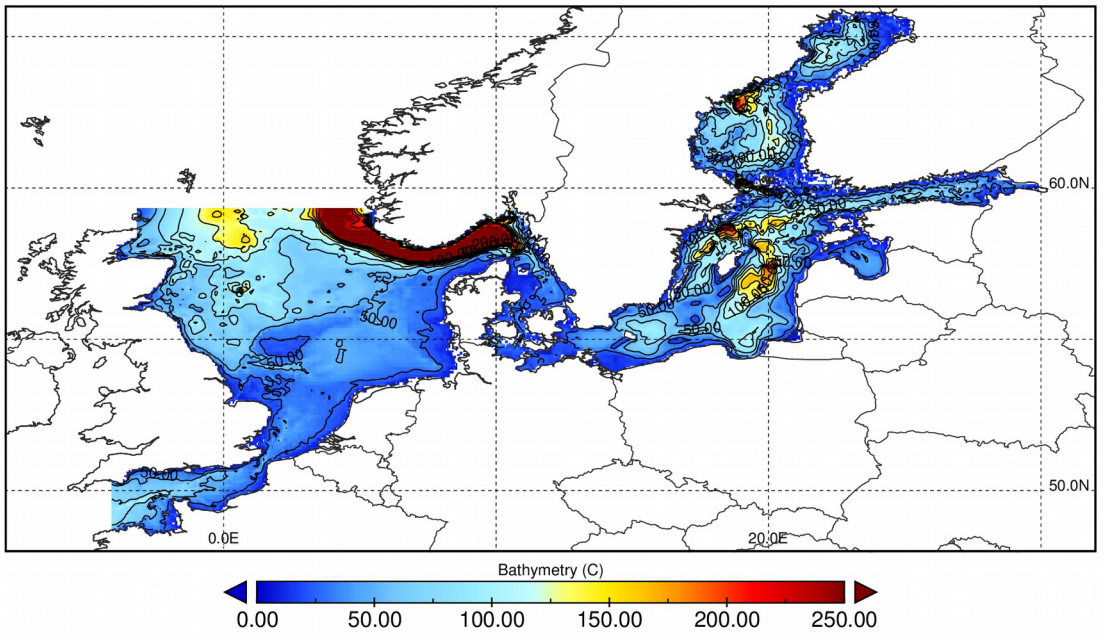
Analysis = closes to reality?

Model SMHI

Model: Nemo-Nordic 1.0 (Hordoir et al., 2018)

Setup for simulating the mean climate and mean basic biogeochemical cycles

- horizontal Resolution: λ=1/18 φ=1/30 → grid_area = ~9 – 15 km^2
- vertical: 56 z* levels between 3 and 22 m, k-eps turbulence closure
- lateral boundary : ECMWF ORAS4
- 12 tidal components
- sea ice module LIM3
- passively coupled biogeochemistry possible

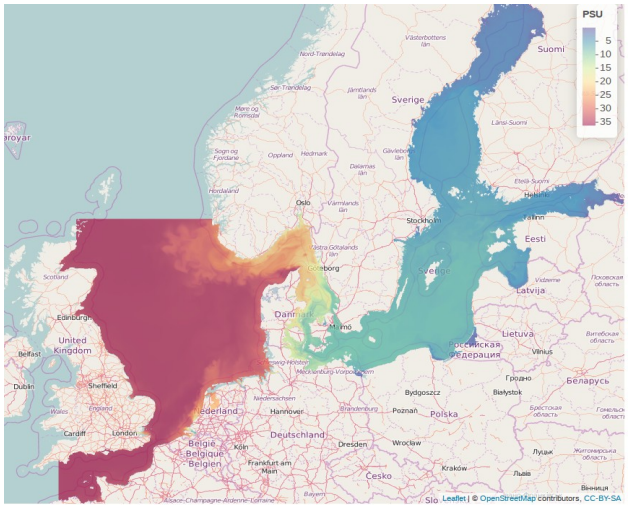


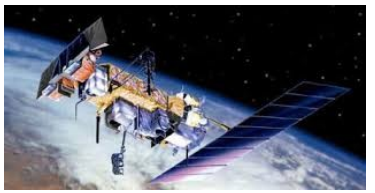
Model: Nemo-Nordic 1.0 (Hordoir et al., 2018)

Operational setup

NEMO-Nordic
for operational purposes

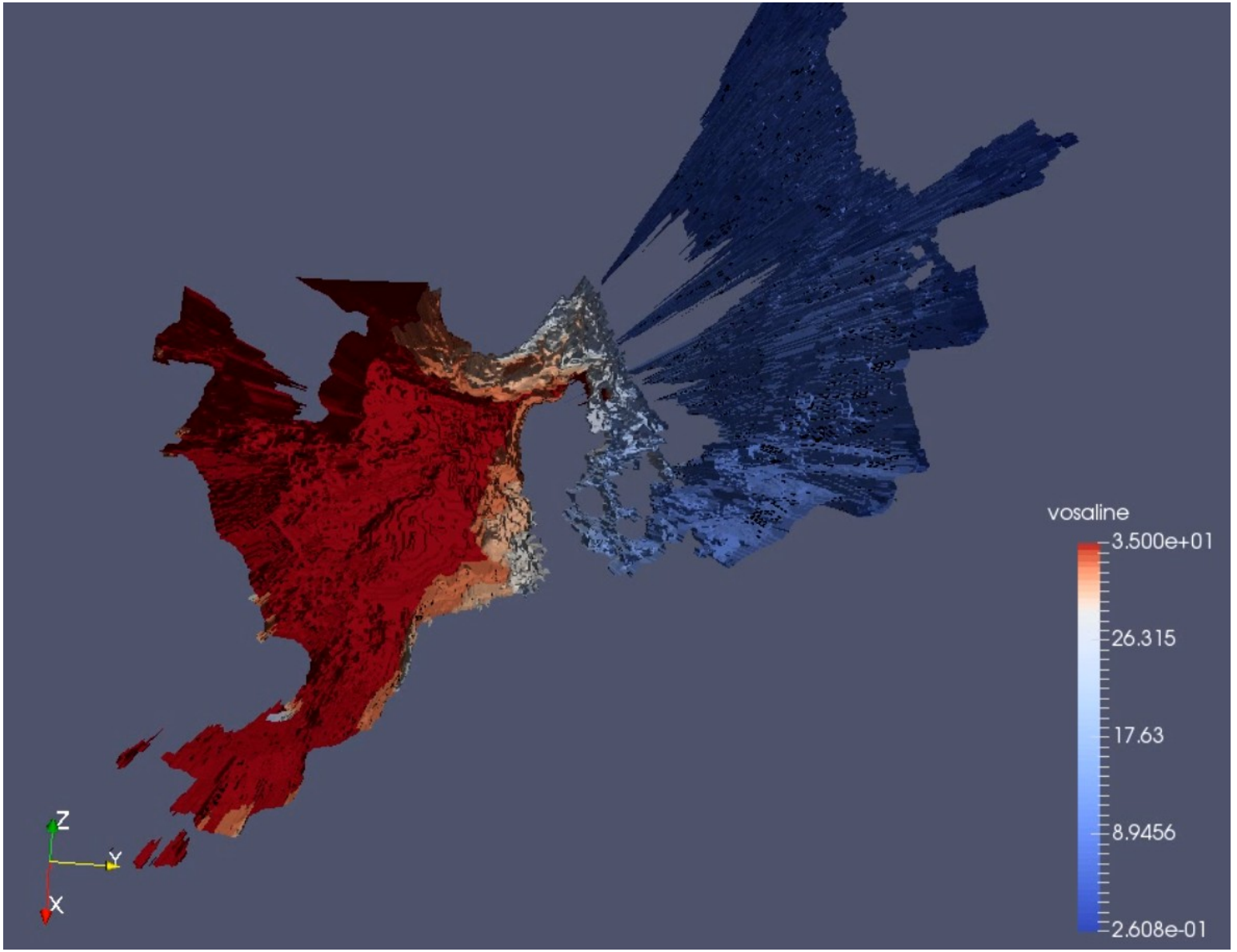
- Covers the North Sea-Baltic Sea region
- 1.85 km resolution
- Storm surge ”NEMO-STORM” on boundary, alternatively UK MetOffice 3D baroclinic model
- Data assimilation: 3D EnVar
  - SST
  - S/T profiles
  - Tests:
    - Ice charts
    - Sealevels
    - currents





slide provided by Lars Axell

Movie shows the inflow event 1993 (period 1. January to 1. May)



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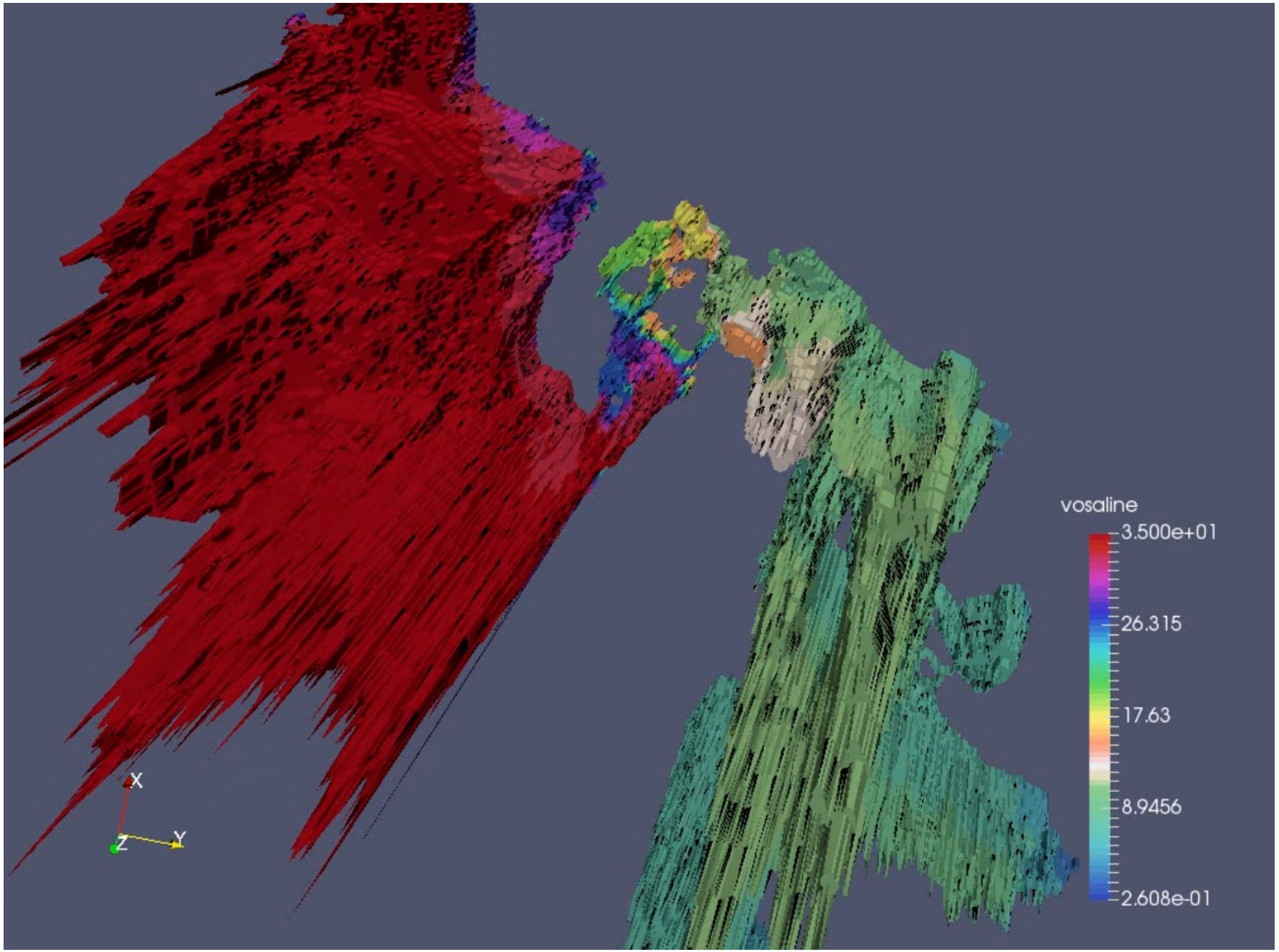

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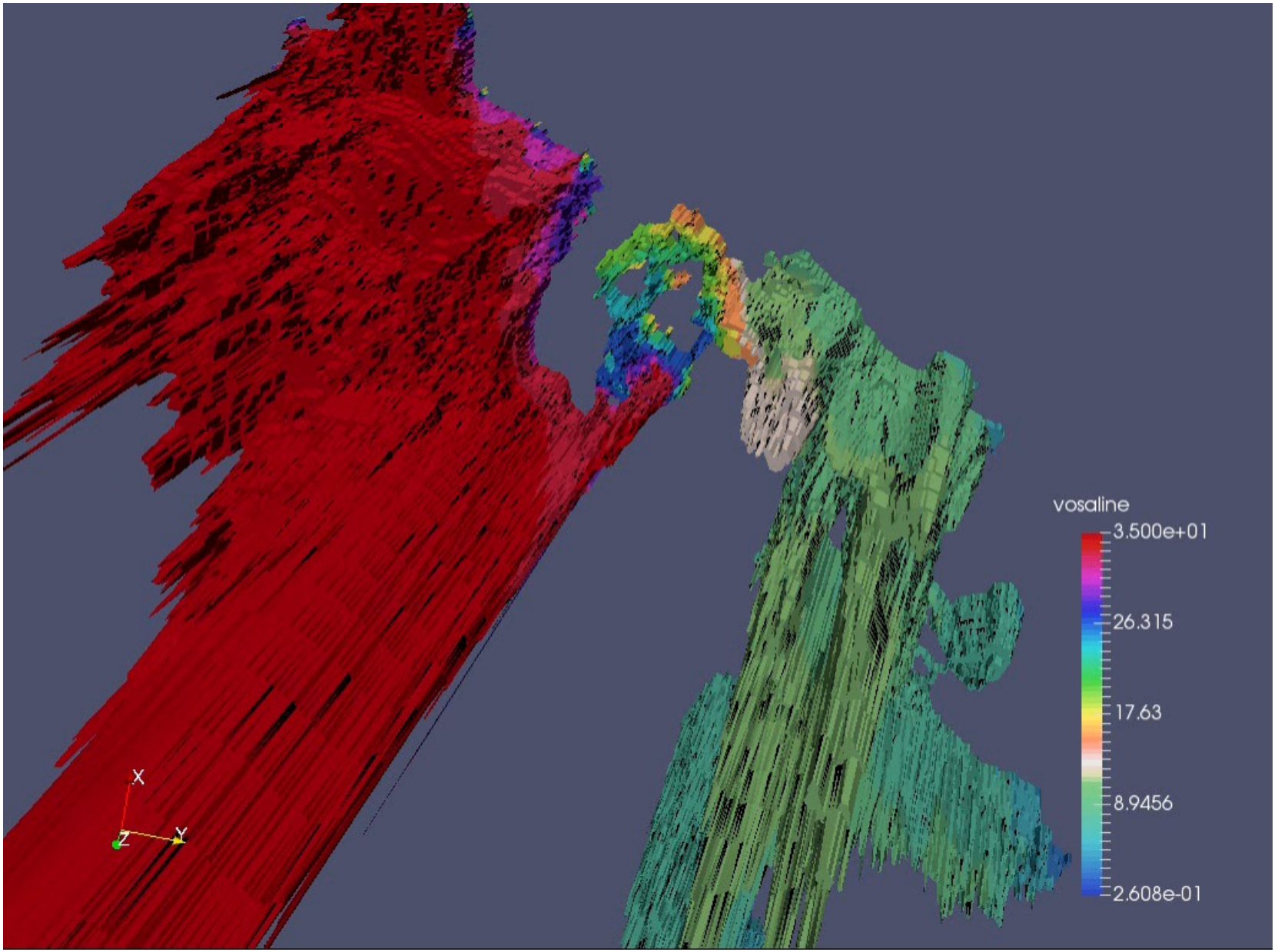
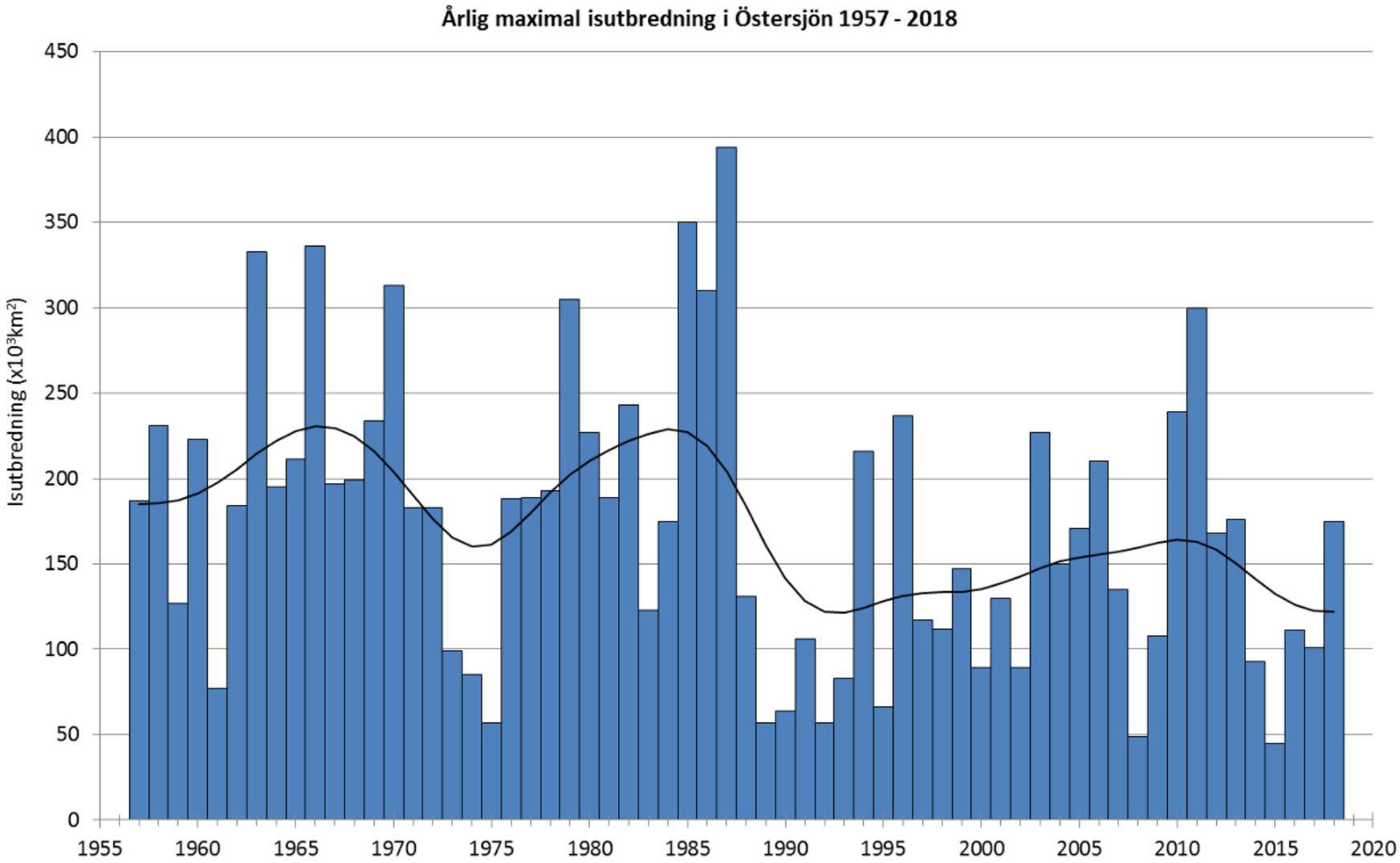


Timeline: For for now plans!

start of first UERRA runs for tuning purposes this year!

atm forcing: UERRA
runoff: ehype interim ???
lateral BC: ORAS4 (1 degree)


Årlig maximal isutbredning i Östersjön 1957 - 2018
Isutbredning (x10³km²)
450
400
350
300
250
200
150
100
50
0
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020