



# Future suspended sediment delivery to the Rhine-Meuse Delta



Researching the Future of our Rivers

EGU Presentation 2020

Jana Cox ([j.r.cox@uu.nl](mailto:j.r.cox@uu.nl))

Frances Dunn ([f.e.dunn@uu.nl](mailto:f.e.dunn@uu.nl))

Jaap Nienhuis ([j.h.nienhuis@uu.nl](mailto:j.h.nienhuis@uu.nl))



Utrecht University

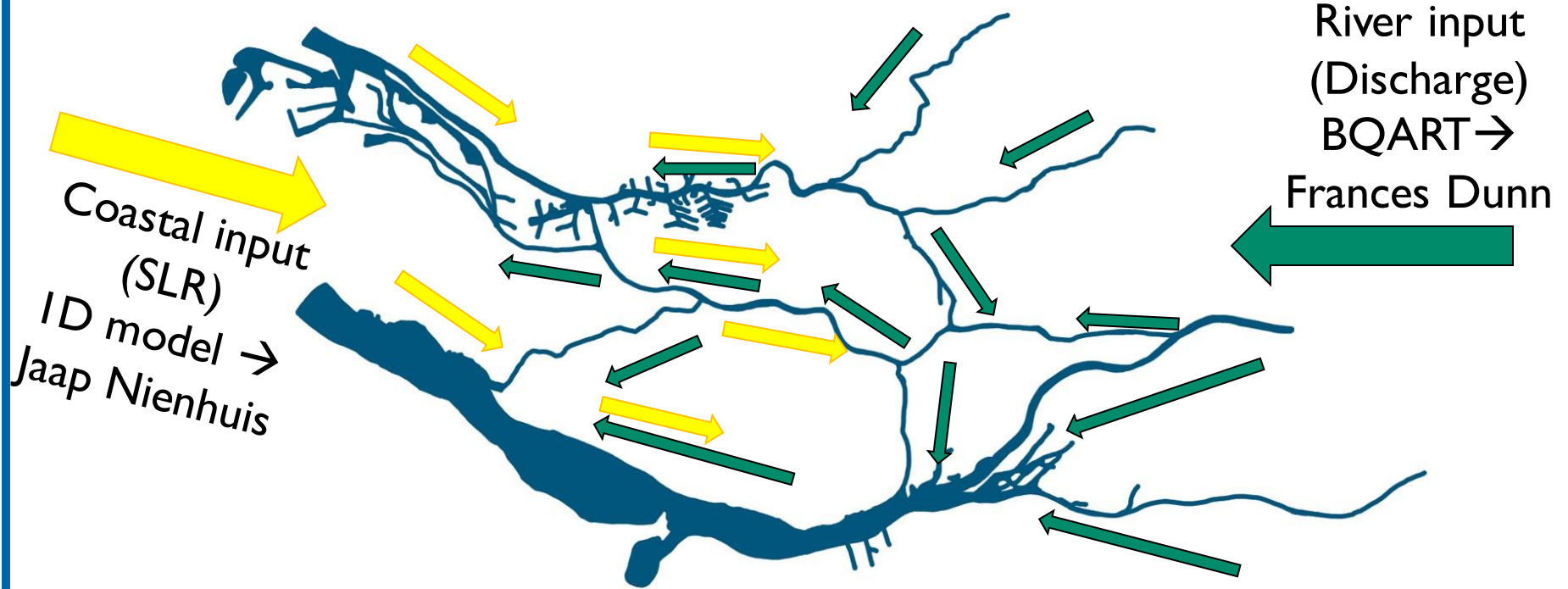
# Background & research question

- Rhine Meuse Delta (RMD) distributary network is affected by human action and climate change
- How will these pressures affect the flow and distribution of water and sediment within the distributary network?
- RMD has a negative sediment budget
- Area is losing sediment causing uneven bed level change
- For most of the delta suspended sediment is key for maintaining elevation
- Climate change alters upstream discharge & sea level rise at the boundaries



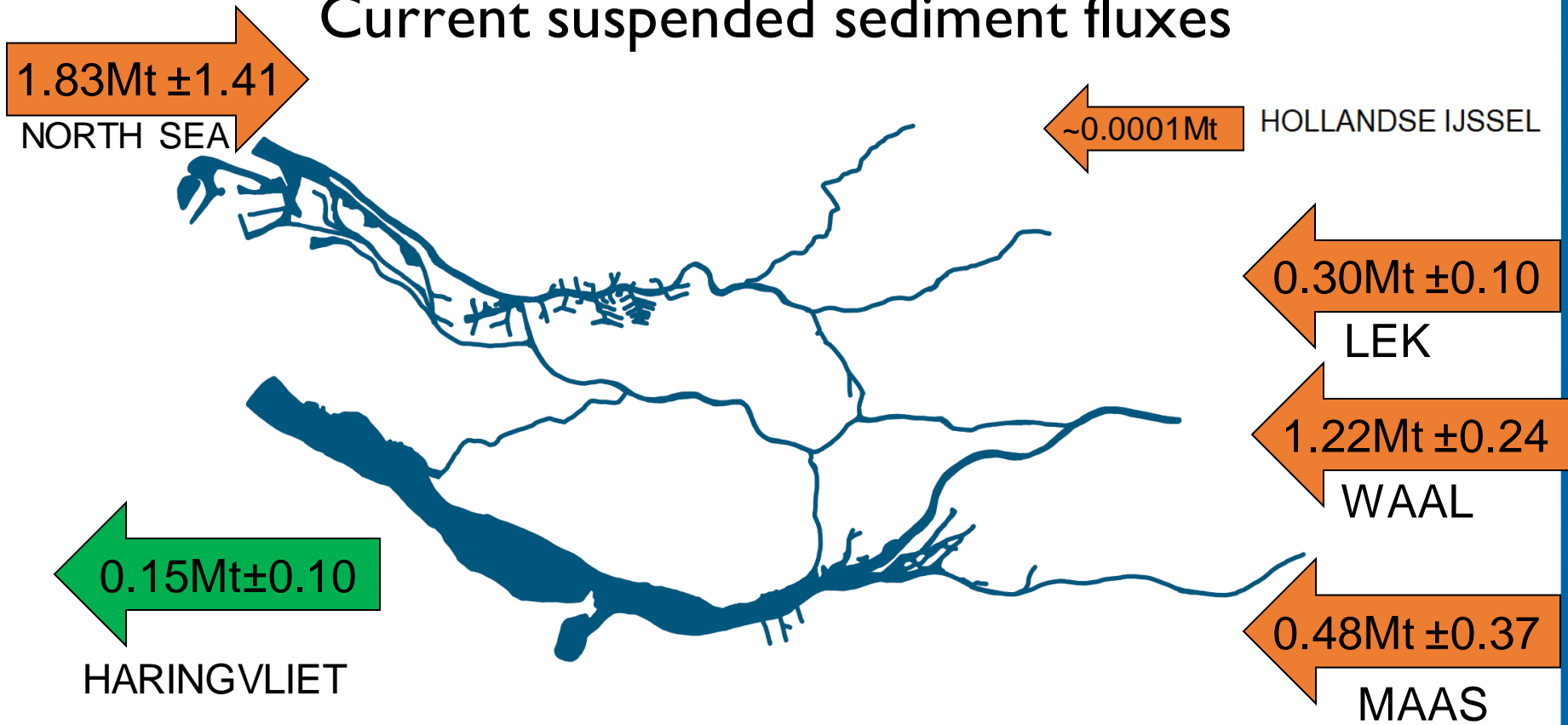
**How will this affect suspended sediment delivery to the delta?**

Use KNMI scenarios for discharge change & sea level rise for next 100 years



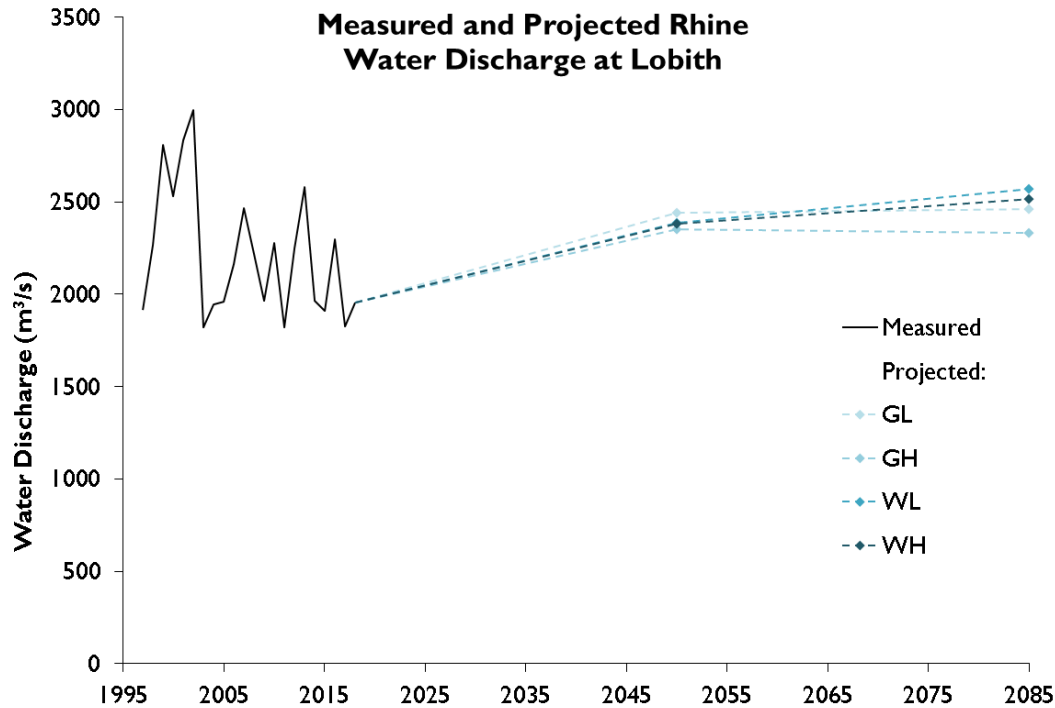
Sediment distribution  
Discharge-suspended sediment (QS) relations & changing bed level → Jana Cox

# Current suspended sediment fluxes



*Data from previous sediment budgets  
for the region (Cox et al. in prep)*

# Predicted change to discharge



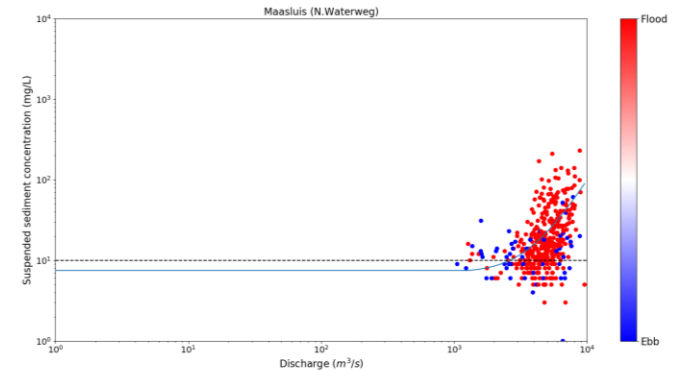
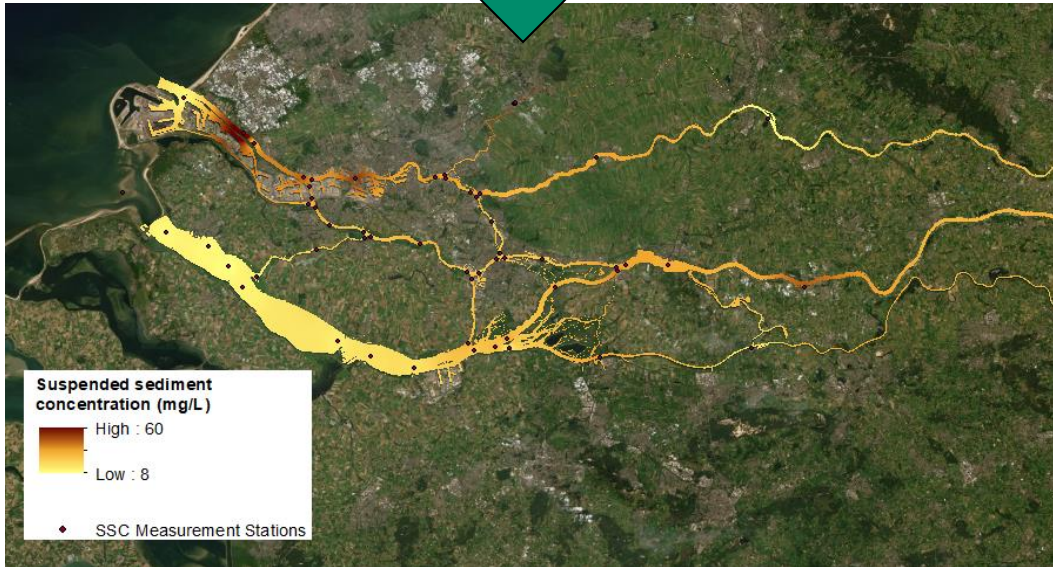
Scenario	Global temperature increase 2050 (2100) °C	Atmospheric circulation change
GL	1 (2)	Weak
GH	1 (2)	Strong
WL	2 (4)	Weak
WH	2 (4)	Strong

- Measured water levels from the Rijkswaterstaat Service Desk, downloaded April 2020 ([waterinfo.rws.nl](http://waterinfo.rws.nl))
- Discharge projections from Weiland et al. (2015) using climate scenarios from EC-Earth-RACMO2 designed for the Rhine and Meuse basins

Weiland, F. S, Hegnauer, M., Bouaziz, L, and Beersma, J. (2015) Implications of the KNMI'14 climate scenarios for the discharge of the Rhine and Meuse, Deltares, 1220042-000-ZWS-0004

# QS relations

Uneven distribution of SSC



Non-linear discharge  
suspended sediment relations

# Conclusions

- Discharge will stay consistent or show only a small increase over time
- Sea level rise will increase water levels mostly in the northern branches
- Sediment is distributed unevenly over the branches of the RMD
- Sediment management measures such as dams, dikes and dredging will be crucial in determining sediment delivery
- Seasonal changes will be increasingly important