Lessons from the Baltic Sea

Lara Fowler, Penn State

STAC Quarterly Meeting, 15 September 2020

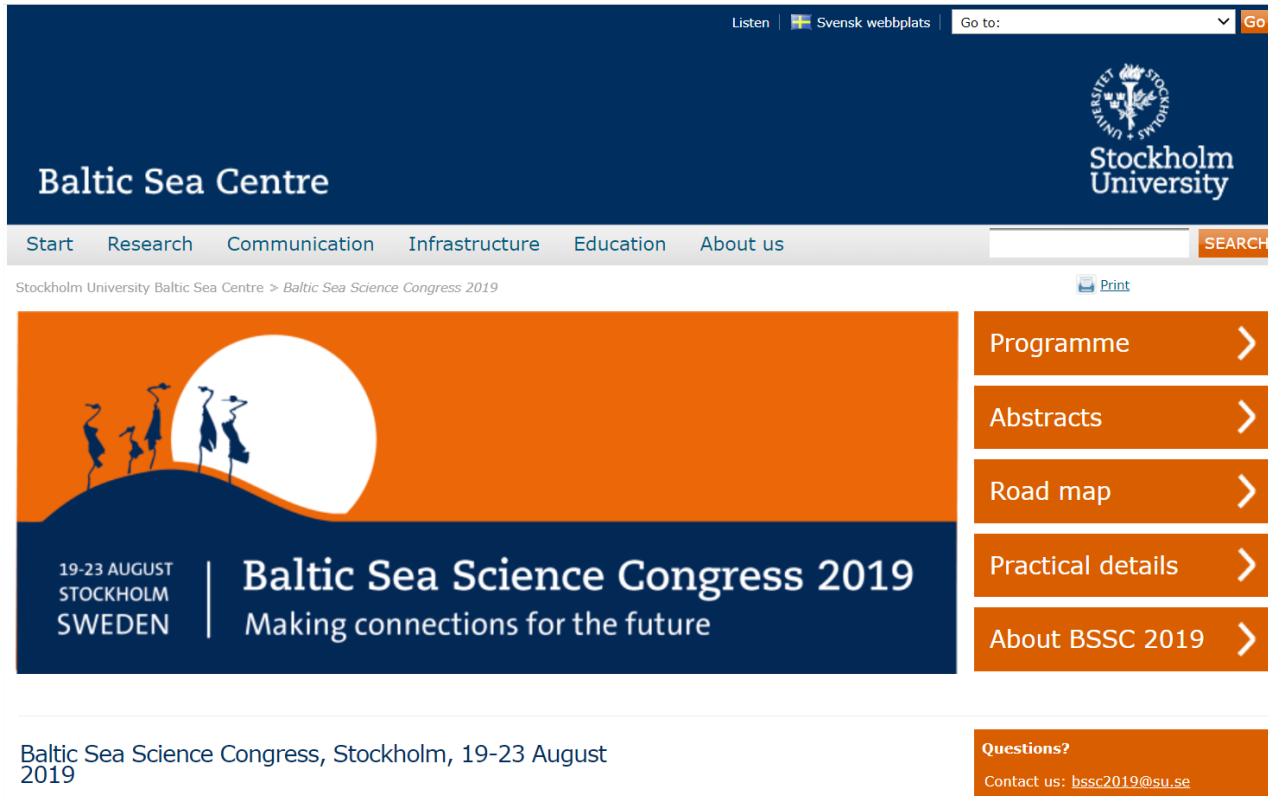
FULBRIGHT Sweden

UPPSALA UNIVERSITET

Opportunity from Fulbright Sweden
Aug. 2019- May 2020

- Where are people finding “success” in managing water (water quality, flood/drought)
  - Scale?
  - Scope?
  - How?
- What are the commonalities/differences in solutions?

Key takeaways from the Baltic Sea Science Congress (Aug 2019)



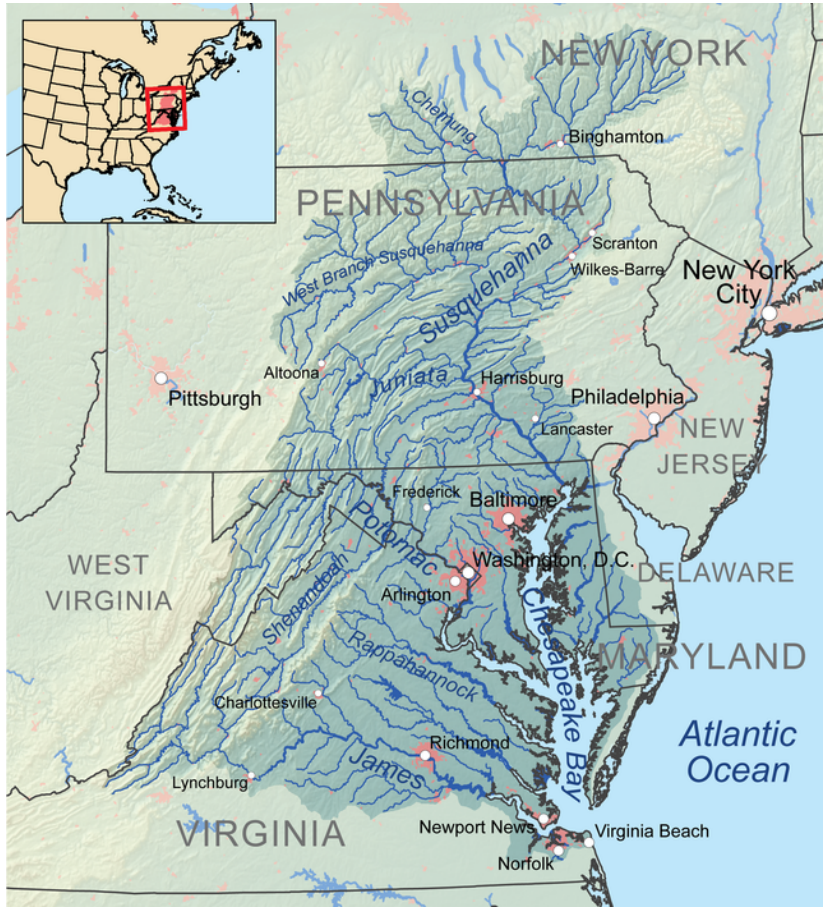
1. Lot of great people/research
2. Nutrient reductions made, but more needed (ag, urban stormwater)
3. No easy answers
4. Need to better engage social scientists, stakeholders, decision makers
5. Science/policy gap sizable
6. Many existing challenges (esp. impact of people on system)
7. New challenges emerging (CECs, climate change)
8. Regular call for more cooperation
9. BONUS funding critical
10. Could have been talking about the Chesapeake!

Comparing the Baltic & the Chesapeake

Land: 2 million km^2, 9 countries

Population: 85 million people

Water: 415,000 km^2, 250 rivers. Land/ water ratio of 4:1. Mean depth: 58 meters



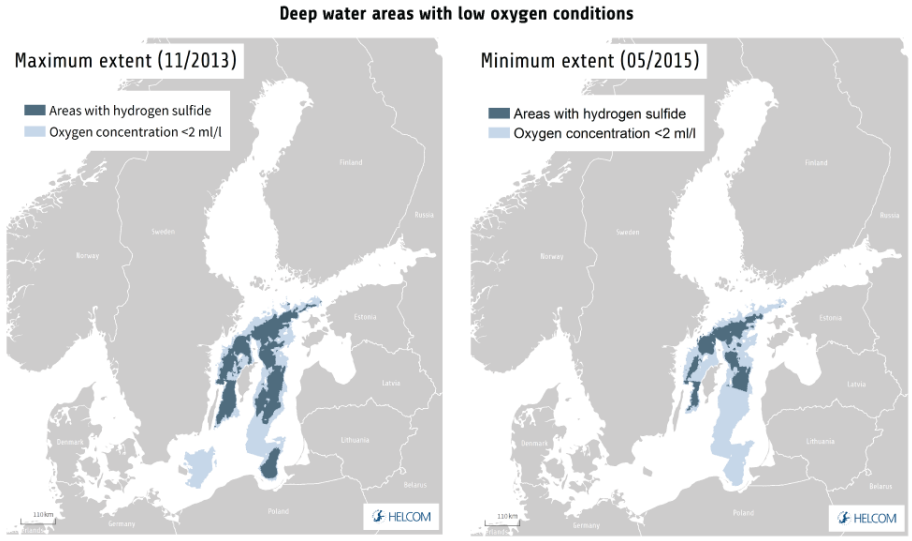
Land: 166,000 km^2, 6 states + Wash. DC

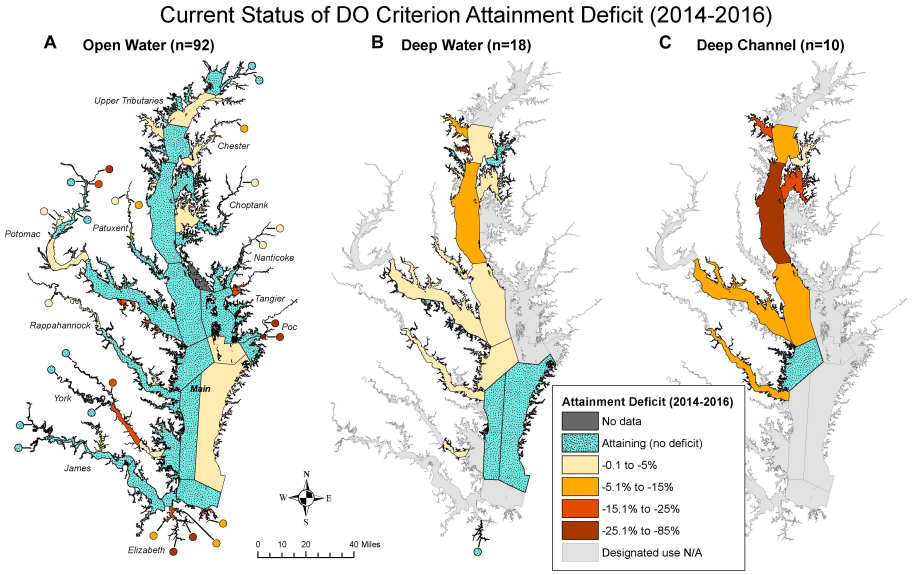
Population: 17 million people

Water: 11,400 km^2, 150 rivers, Land/water ratio of 15:1. Mean depth: 6.5 meters

Sources: Iho et al 2015; Reusch et al., Sci. Adv. 2018, HELCOM; Chesapeake Bay Program

Challenges & multiple stressors common to the Baltic and the Chesapeake





- Large deoxygenated areas, particularly in the deep-water areas
- Although decreasing nutrient discharge (esp. from wastewater treatment), lag in improvements due to legacy sediments, nutrients
- Continued nutrient pollution, particularly from agriculture and stormwater runoff
- Climate change impacts: warming, acidification, weather extremes, more
- Toxics & emerging contaminants
- Impacts to biodiversity: fishing, predation, invasive (non-indigenous) species
- Human well-being

Sources: Zhang et al 2018; Reusch et al. 2018; HELCOM; Chesapeake Bay Program

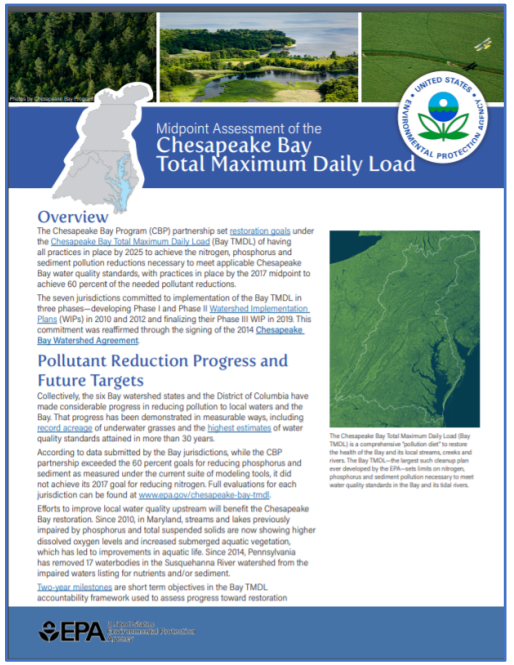
The Baltic & the Chesapeake are both making progress but aren't there yet

"[A]lthough signs of improvement in the state of the Baltic Sea are seen in some cases, the Baltic Sea Action Plan goals and ecological objectives have not yet been reached"

- HELCOM State of the Baltic Sea

The assessment found that the jurisdictions have made considerable progress in reducing pollution that is reflected in measurable ways, including record acreage of underwater grasses and the highest estimates of water quality standards attained in more than 30 years. **While the 60 percent goals for reducing phosphorus and sediment as measured under the current suite of modeling tools were exceeded, the goal for reducing nitrogen was not met.**

-EPA 2017 Mid Point Assessment



Opportunity for engagement

AARHUS UNIVERSITY

Find

Baltic Sea Science Congress, Denmark, June 2021

Conferences › BSSC2021: 13th Baltic Sea Science Congress hosted by Aarhus University › Scientific programme › Overarching themes

BSSC2021: 13th Baltic Sea Science Congress hosted by Aarhus University

- Home
- Registration
- Scientific programme
  - Overarching themes
    - Theme 1: Transition
    - Theme 2: Ecosystems
    - Theme 3: Contaminants
    - Theme 4: New technologies
    - Theme 5: Stewardship

Overarching themes

Session themes for BSSC2021

The Baltic Sea Science Congress invites scientists studying the Baltic Sea or similar coastal sea systems to share their results at this international and interdisciplinary forum. BSSC2021 focuses on five overarching themes (listed below). We also invite research of general relevance to the topic of the Congress from other coastal seas. In particular, we encourage presentations focusing on coastal and marginal seas that contribute to the UN Decade of Ocean Science for Sustainable Development.

Click on the themes to the left, to read a detailed description

Revised 25.08.2020 - Charlotte Hviid

Opportunities to engage for the Baltic Sea Science Congress (June 14-18, 2021, https://conferences.au.dk/bssc2021/)

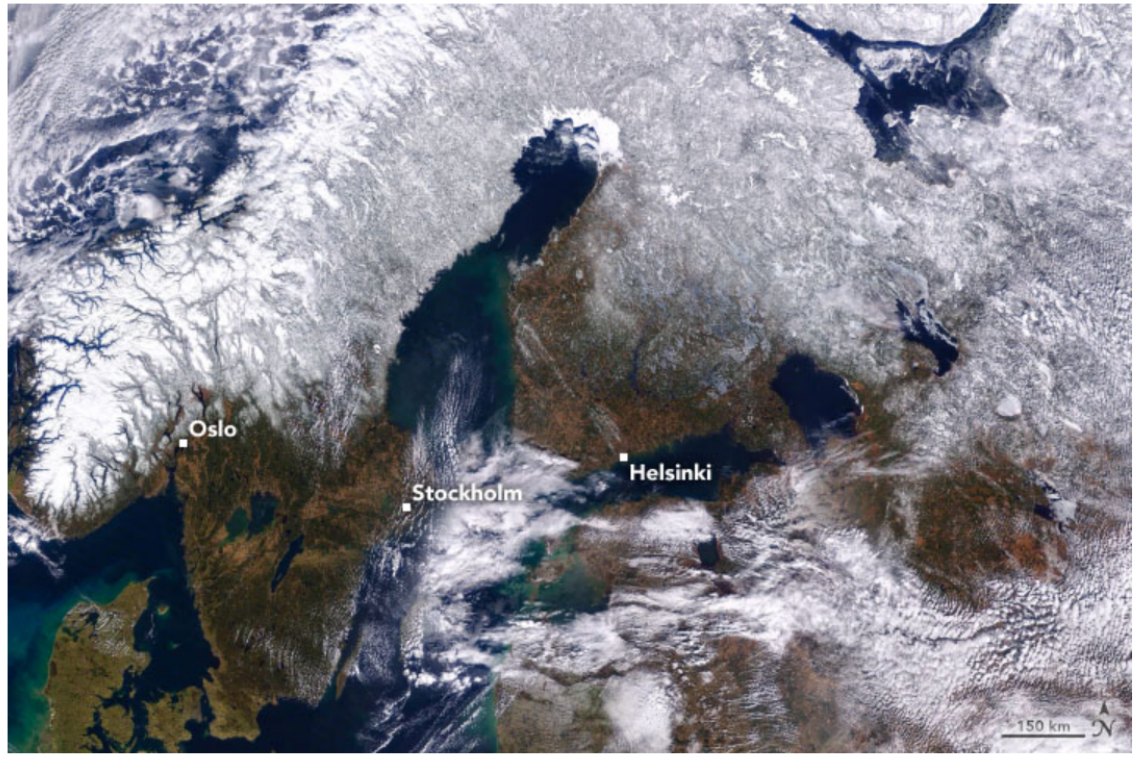
» Overarching themes
- Theme 1: Transition
- Theme 2: Ecosystems
- Theme 3: Contaminants
- Theme 4: New technologies
- Theme 5: Stewardship

<u>Specific Chesapeake Bay related opportunities</u>

- Ann Swanson, keynote speaker
- Special session on Chesapeake/Baltic comparisons

[Each call for abstracts will include "what can we learn from elsewhere"]

Opportunities for research?



March 20 - 21, 2020

JPEG

Loss of snow cover/potential cover crops

Shift in crops (corn in Denmark?)

Nonpoint runoff (ag/urban)

Socio-behavioral

Climate

CECs

More

Questions/discussion?

Lara Fowler, Penn State

lbf10@psu.edu