

Lessons from the Baltic Sea

Lara Fowler, Penn State

STAC Quarterly Meeting, 15 September 2020



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?



UPPSALA
UNIVERSITET

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

Listen | Svensk webbplats | Go to: Go

Baltic Sea Centre

Stockholm University

Start Research Communication Infrastructure Education About us SEARCH

Stockholm University Baltic Sea Centre > Baltic Sea Science Congress 2019 [Print](#)

19-23 AUGUST
STOCKHOLM
SWEDEN | **Baltic Sea Science Congress 2019**
Making connections for the future

Programme >

Abstracts >

Road map >

Practical details >

About BSSC 2019 >

Questions?
Contact us: bssc2019@su.se

Baltic Sea Science Congress, Stockholm, 19-23 August 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



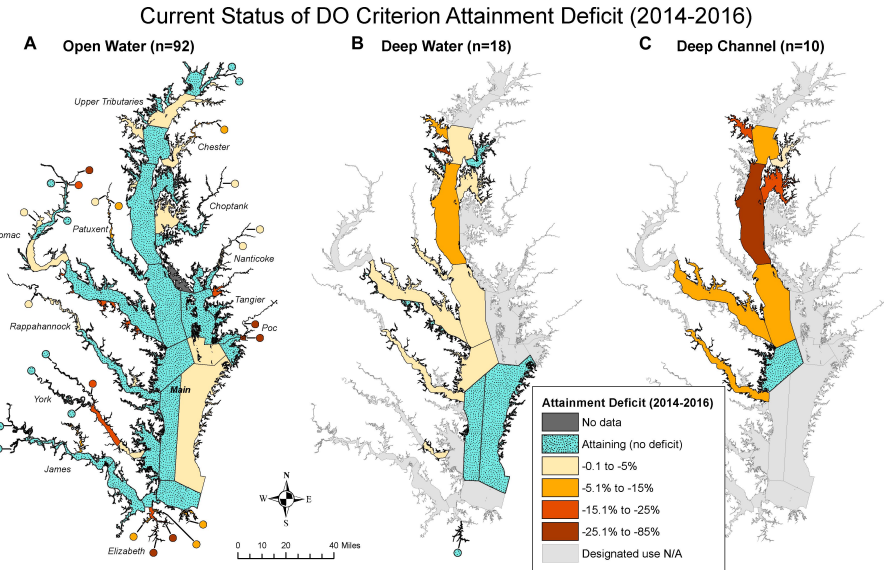
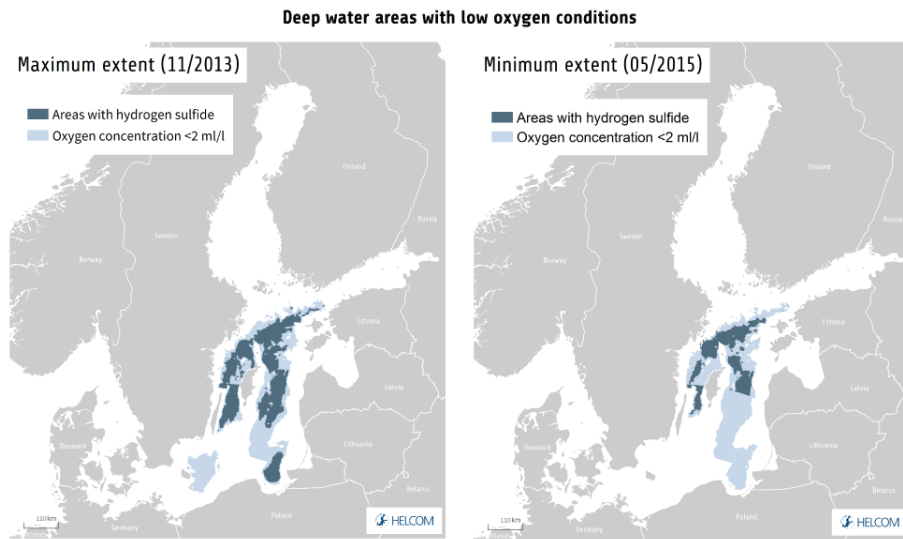
Land: 2 million km², 9 countries
Population: 85 million people
Water: 415,000 km², 250 rivers. Land/ water ratio of 4:1. Mean depth: 58 meters



Land: 166,000 km², 6 states + Wash. DC
Population: 17 million people
Water: 11,400 km², 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

Overview

The Chesapeake Bay Program (CBP) partnership set [restoration goals](#) under the [Chesapeake Bay Total Maximum Daily Load \(Bay TMDL\)](#) of having all practices in place by 2025 to achieve the nitrogen, phosphorus and sediment pollution reductions necessary to meet applicable Chesapeake Bay water quality standards, with practices in place by the 2017 midpoint to achieve 60 percent of the needed pollutant reductions.

The seven jurisdictions committed to implementation of the Bay TMDL in three phases—developing Phase I and Phase II [Watershed Implementation Plans \(WIPs\)](#) in 2010 and 2012 and finalizing their Phase III WIP in 2018. This commitment was reaffirmed through the signing of the 2014 [Chesapeake Bay Watershed Agreement](#).

Pollutant Reduction Progress and Future Targets

Collectively, the six Bay watershed states and the District of Columbia have made considerable progress in reducing pollution to local waters and the Bay. That progress has been demonstrated in measurable ways, including [record acreage](#) of underwater grasses and the [highest estimates](#) of water quality standards attained in more than 30 years.

According to data submitted by the Bay jurisdictions, while the CBP partnership exceeded the 60 percent goals for reducing phosphorus and sediment as measured under the current suite of modeling tools, it did not achieve its 2017 goal for reducing nitrogen. Full evaluations for each jurisdiction can be found at www.epa.gov/chesapeake-bay-tmdl.

Efforts to improve local water quality upstream will benefit the Chesapeake Bay restoration. Since 2010, in Maryland, streams and lakes previously impaired by phosphorus and total suspended solids are now showing higher dissolved oxygen levels and increased submerged aquatic vegetation, which has led to improvements in aquatic life. Since 2014, Pennsylvania has removed 17 waterbodies in the Susquehanna River watershed from the impaired waters listing for nutrients and/or sediment.

Two-year milestones are short term objectives in the Bay TMDL accountability framework used to assess progress toward restoration.

EPA U.S. Environmental Protection Agency

Opportunity for engagement

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**

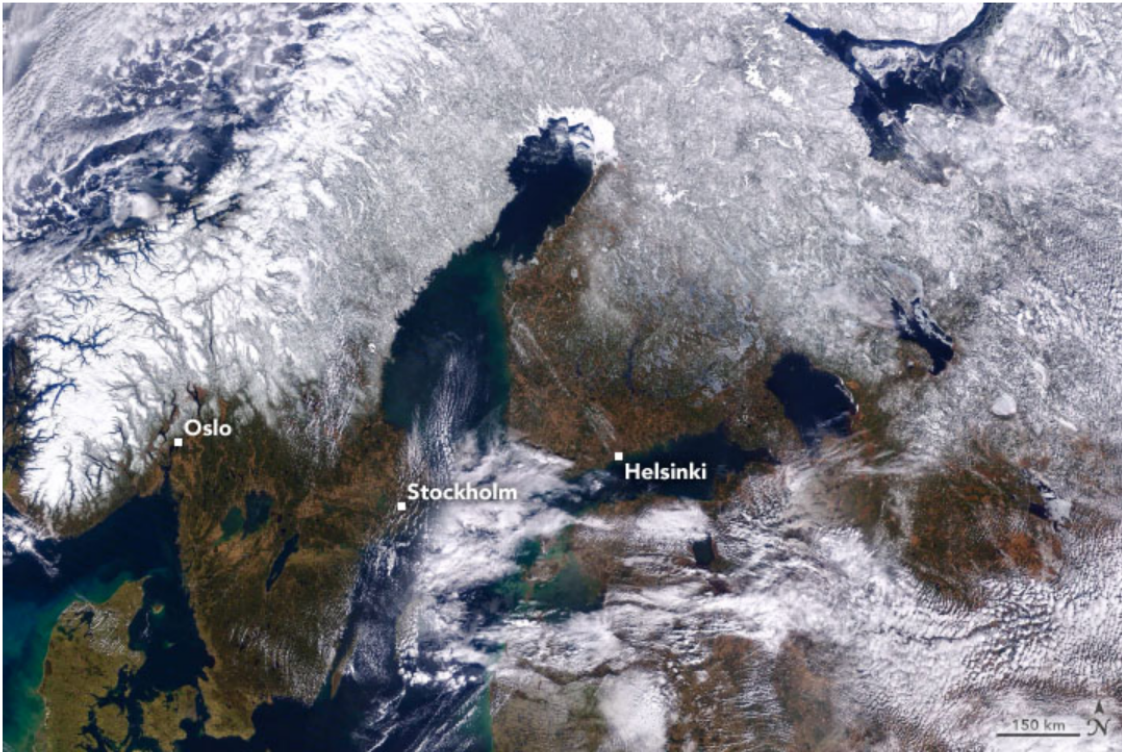
- › Theme 1: Transition
- › Theme 2: Ecosystems
- › Theme 3: Contaminants
- › Theme 4: New technologies
- › Theme 5: Stewardship

Specific Chesapeake Bay related opportunities

- 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