Increases in organic matter export to coastal waters: Effects on lower food web structure and contaminant bioaccumulation **(DOMCON)**

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About the project

- Highly interdisciplinary project focused on effects of terrestrial inputs on downstream ecology and contaminant dynamics

- Project start up in 2015
  - co-funded by emerging contaminants SIS and climate SIS

- Project continuing in 2016
  - funded by NIVA's new SIS on land-ocean interactions

General premise

- Fluxes of freshwater and terrestrial organic matter to many northern aquatic ecosystems are on the rise

- Strong implications for contaminant transport, as well as uptake into and transfer through coastal food webs

Source: NRK

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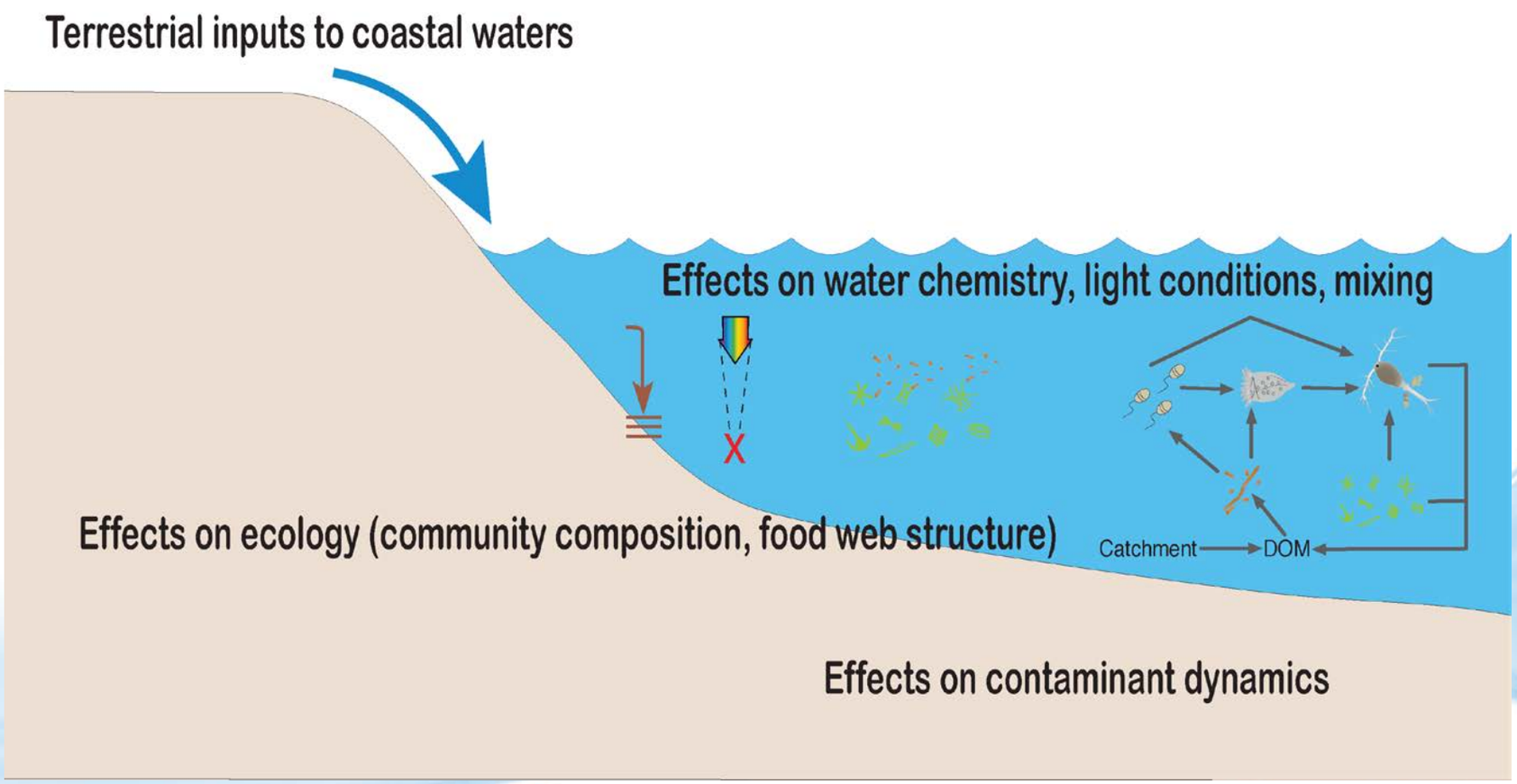
Key questions in the DOMCON project

- What effects do river inputs have on:
  - coastal water chemistry
  - productivity
  - coastal food webs
  - contamination of coastal waters and organisms



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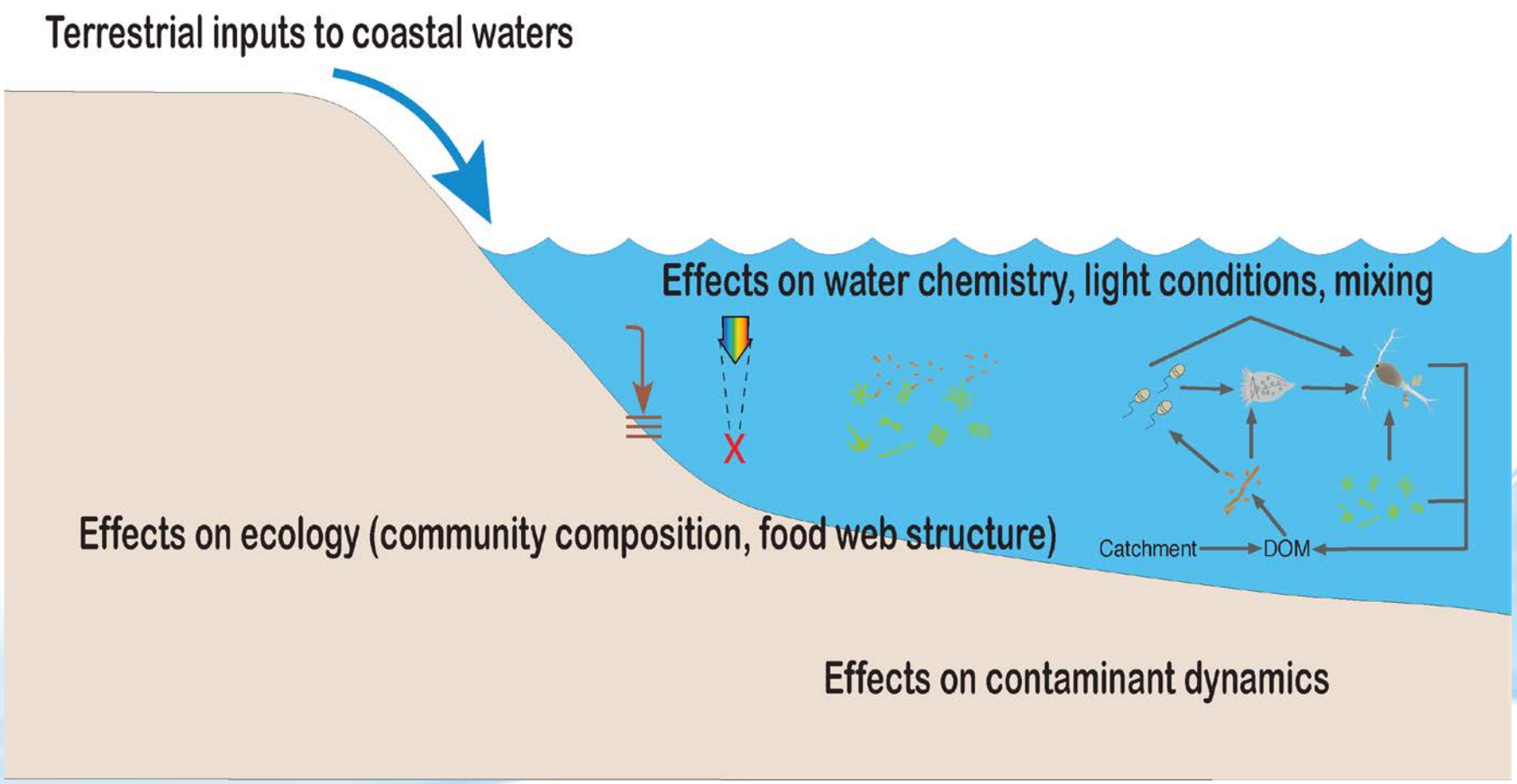
- What effects do river inputs have on:
  - coastal water chemistry
  - productivity
  - coastal food webs
  - contamination of coastal waters and organisms

How might climate change alter these inputs and their impacts?



Main hypotheses

- This could lead to:
- increased transport of DOM-associated contaminants
- changes in bioavailability of contaminants

Source: NRK

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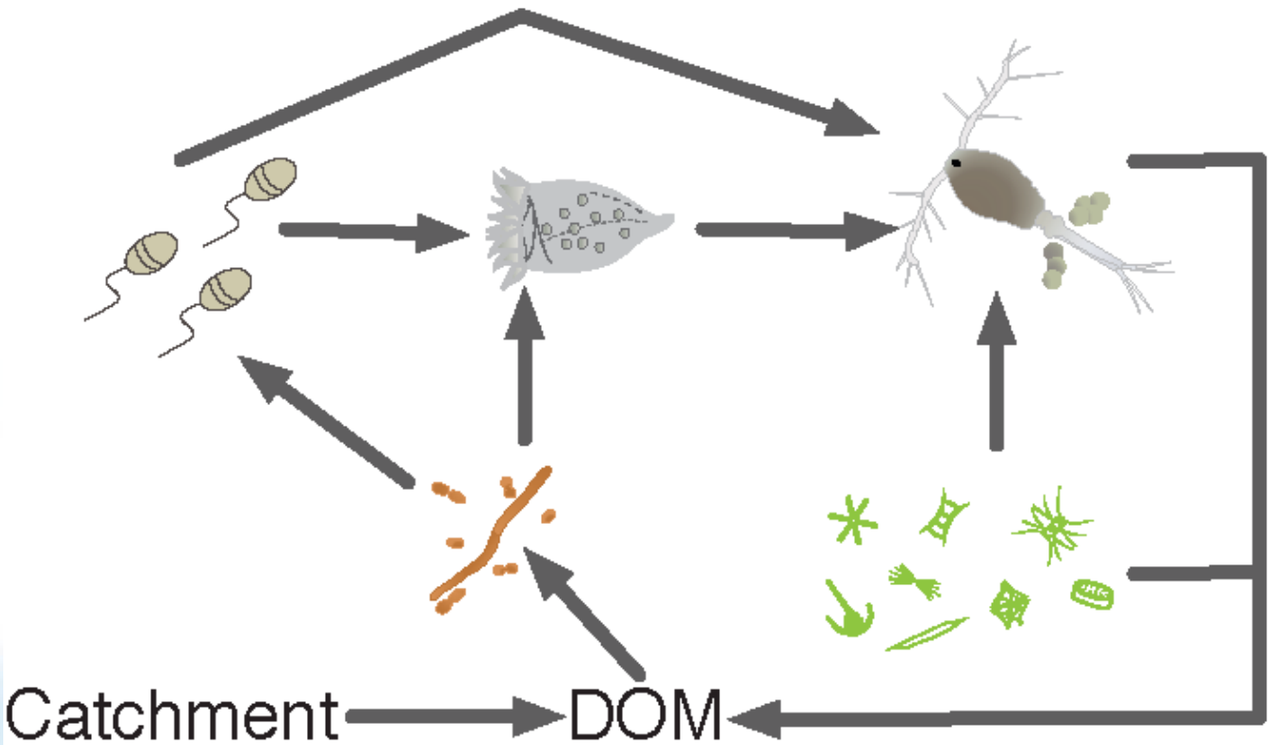
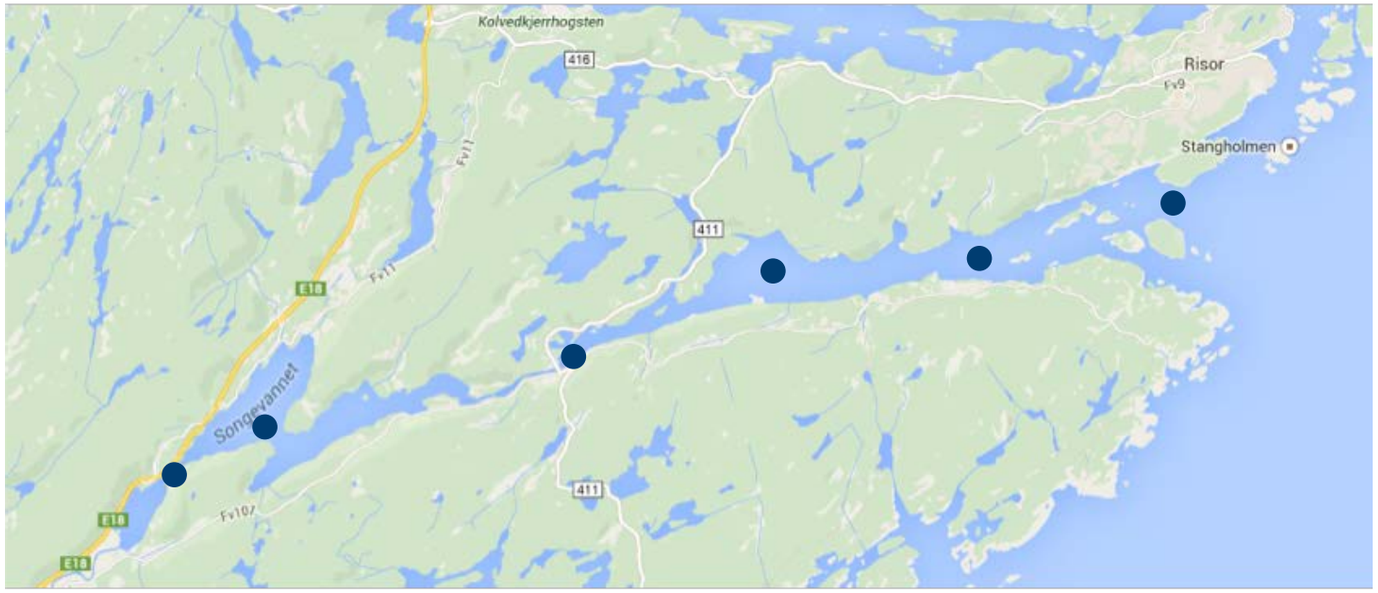
- shifts in lower food web ecology
  - primary and bacterial productivity
  - food web structure

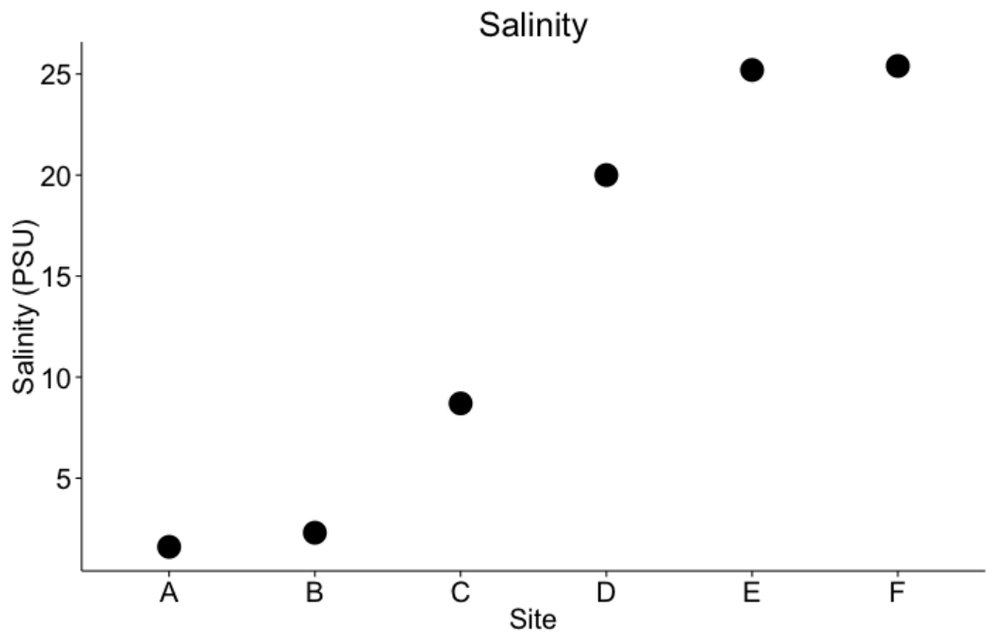


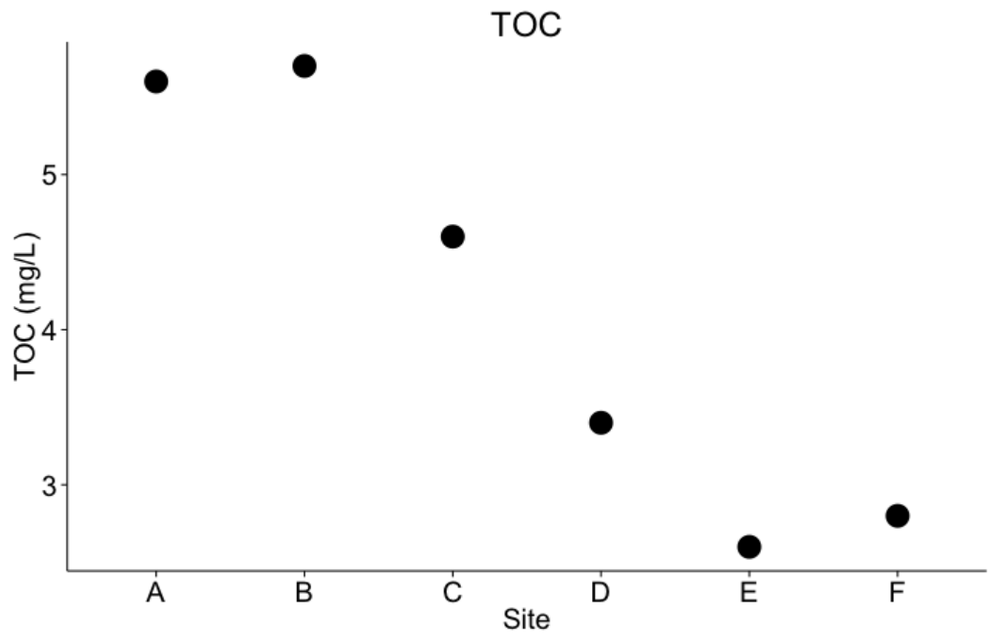
Study design

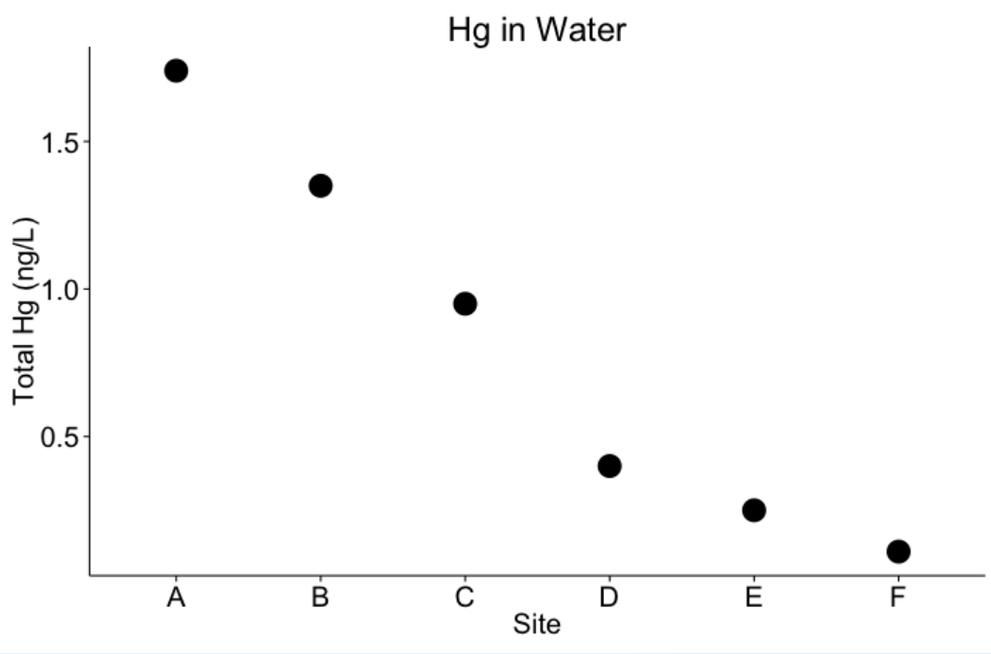
- Collect samples along a gradient from river to sea
  - Storelva-Sandnesfjorden
- Water chemistry
  - nutrients, carbon, contaminants
- Ecology
  - productivity, lower food web structure
- Contaminant dynamics
  - uptake, trophic transfer
  - Hg and PCBs as model compounds

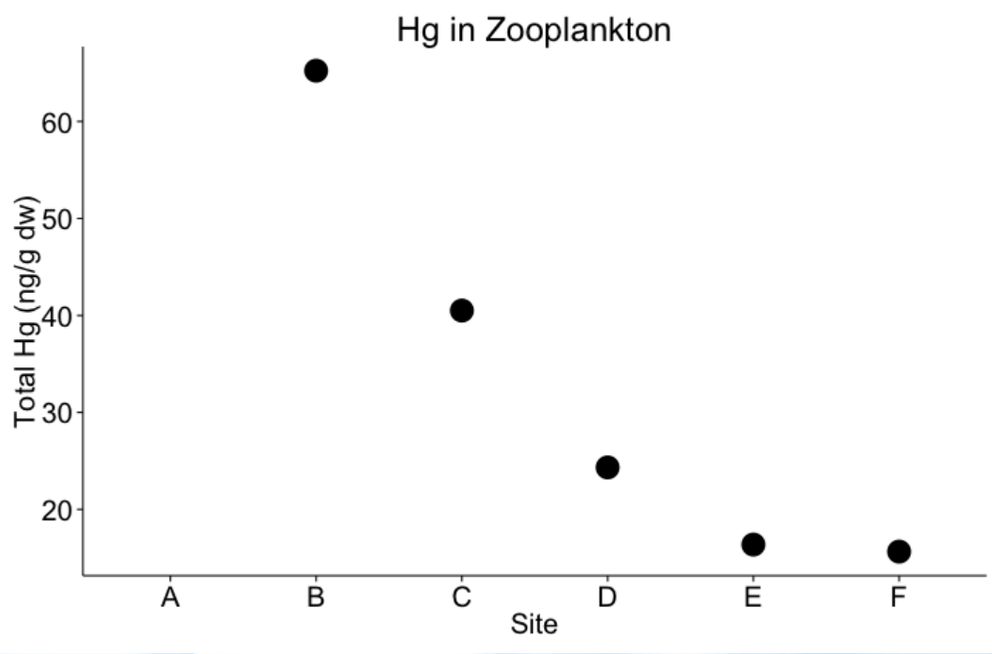


Initial results from 2015









2016 Plans

- Storelva-Sandnesfjord is a highly dynamic system, with a high degree of seasonal variability

- Targeted sampling in 2016 to assess the seasonal variability of prioritised parameters:
  - monthly river sampling (continuation from 2015)
  - quarterly sampling in the fjord (focused on seasonal shifts in food web structure and contaminant accumulation in zooplankton)

Relevance for monitoring and research

- Terrestrial inputs can have strong impacts on coastal biogeochemistry, ecology and contaminant dynamics

- Strong need for baseline information
  - in order to understand how future changes in these inputs can influence coastal ecosystems (fish production, contaminant concentrations in coastal organisms, risks to ecosystem and human health)

- Broad global relevance of these processes
  - boreal freshwater systems (widespread “browning”)
  - Arctic freshwater and coastal systems (permafrost thaw and melting of glaciers are leading to rapid changes in terrestrial inputs to aquatic systems)