Havbase present,

- Solution for ship traffic statistics for Sea Areas (North Sea, Norwegian Sea, Barents Sea and the Arctic)
- Solution for extracting aggregated operational discharge statistics from ships
- Havbase has tables on sailed distance (in nautical miles), estimated discharge to air, port calls, and ship count for ships passing so-called ”pass lines”.

www.kystverket.no
Data sources:

- Land based AIS base stations
- AIS satellite (Mainly relevant outside 40-40nm from the coast)
- Ship registers (IHS Fairplay and Shipinfo)
- DNV-GL (Ship technical data on ships, engine and bunkers)
How is discharge estimates done

- Speed
- Fuel consumption
- Ship type
- Engine measurement modification
- Conventional algorithms, but with improvements
  - CO$_2$
  - SO$_2$
  - SO$
  -$NOx$
  - PM
- Operational discharges of oil (bilge water and wash water) also included, but not published
DEMO

http://www.havbase.no

http://www.havbase.no/havbase_arktis
Limitations

- Havbase is not suitable for analysis at the micro level, for example in relation to news measures in the fairway
- AIS is not flawless
- AIS coverage challenges (dead spots)
- Location Show error as a result of:
  - Technical failure in infrastructure
  - Installation Error on board vessels
  - Problems with data transfer
  - "Cheating" with AIS
  - Etc.
Future development

• Probability module
  – Marine accident
  – Discharge to sea

• Transport planning module

• Improve modelling of emissions to air in ice conditions