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The Continuous Vertical Datum for Canadian Waters Project

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CVDCW

The CVDCW models spatial variability in water levels and Chart Datum.

- enable ellipsoidally referenced surveying for all charted waters
- improve quality of CHS products.
- define high to low tidal water levels along the coast for
  - storm surge warning systems
  - climate change risk & adaptation
  - coastal infrastructure planning
  - coastline definition
  - maritime boundaries

Hydrographic Vertical Separation Surfaces

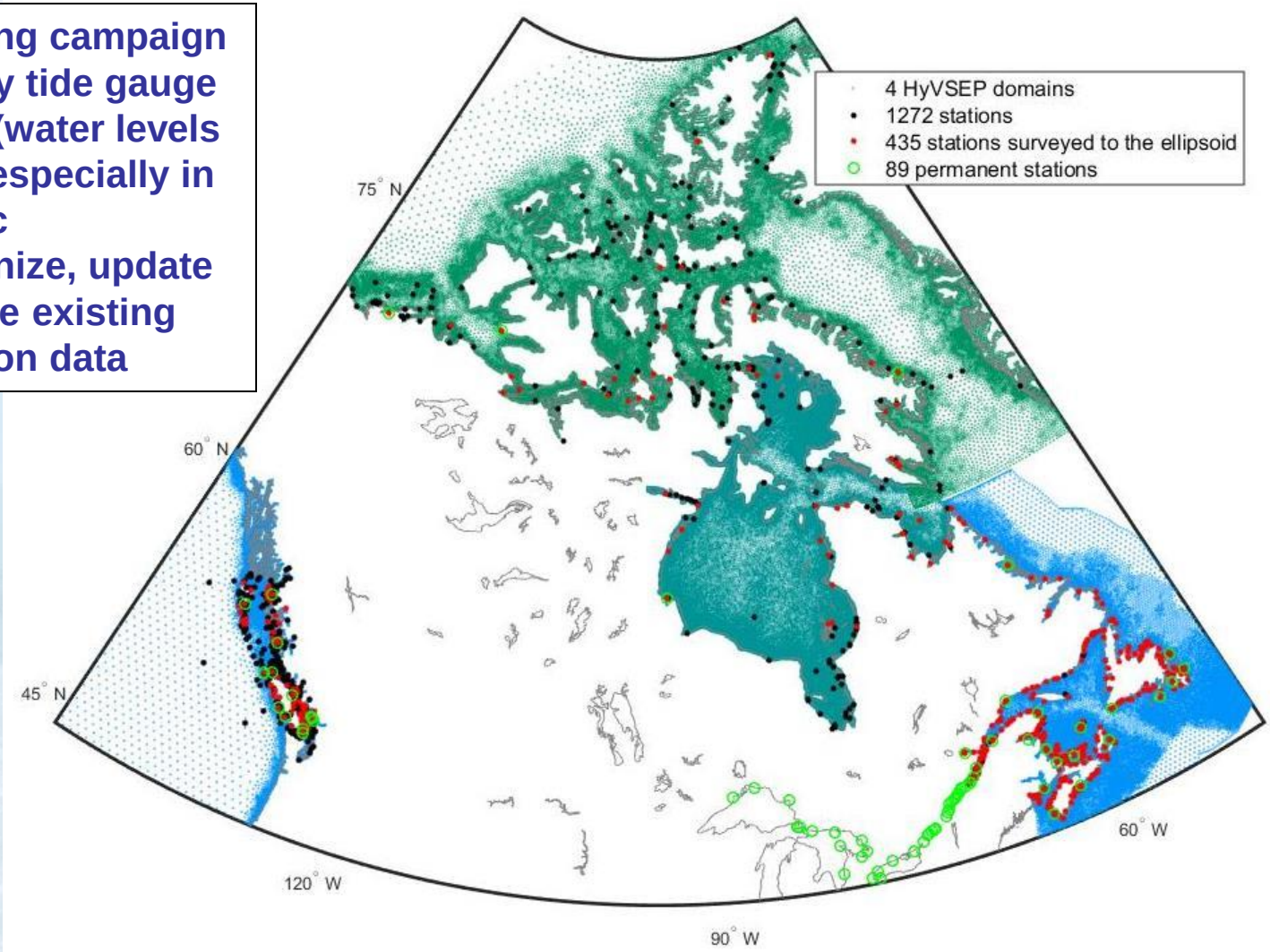
Products of the CVDCW are known as

***Hydrographic Vertical Separation Surfaces* (HyVSEPs)**

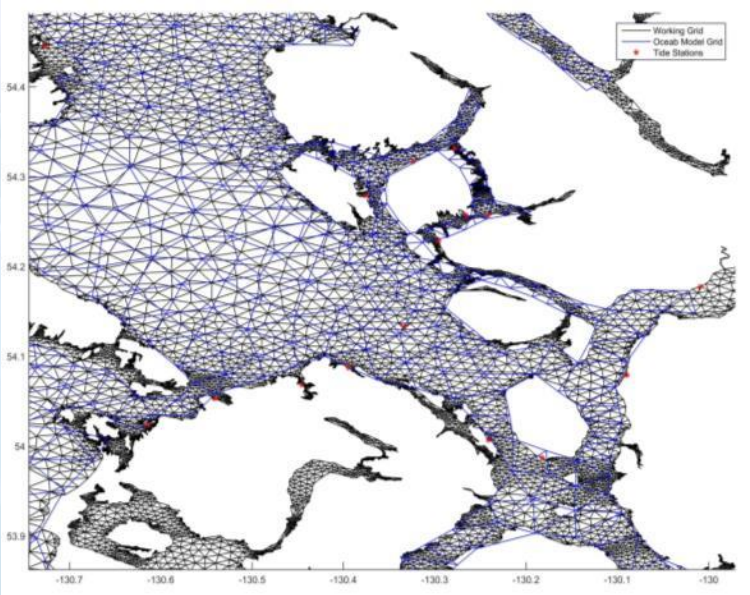
- Tidal HyVSEPs couple water level & GPS observations at tide stations with ocean models, geoid models, satellite altimetry, sea level rise estimates, etc.
- Inland HyVSEPs use only water levels & GPS.
- Produced by modelers & tidal officers at the CHS with support from the Canadian Geodetic Survey.
- Similar products can be derived from VDatum (NOAA/NGS/OCS/CO-OPS).

Water level & GPS data coverage

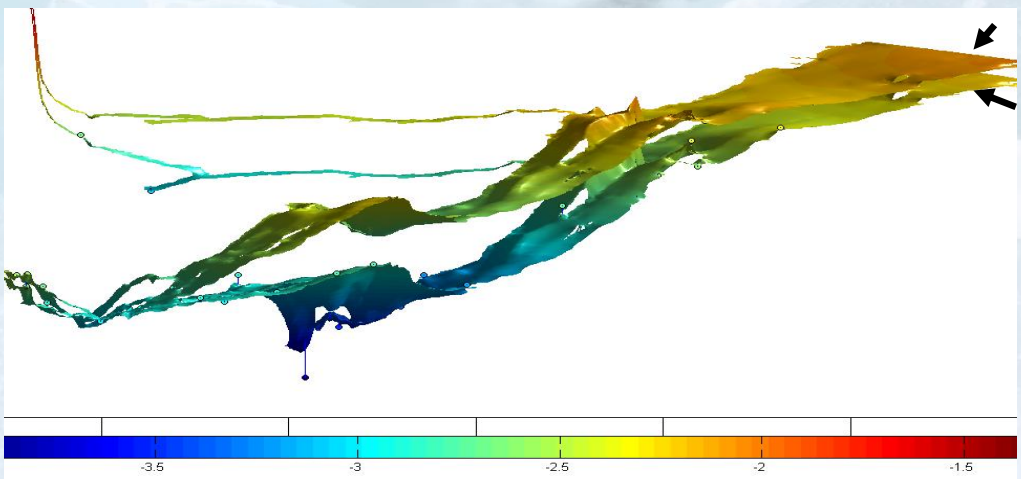
- ongoing campaign to densify tide gauge network (water levels & GPS), especially in the Arctic
- scrutinize, update & improve existing tide station data



Models & Modeling



- **Unlike Vdatum, the CVDCW is a large-scale national project.**
- **Same flexible methods & tools applied for all regions.**
- **Use existing model data at our disposal (e.g. geoid, ocean models).**
- **Modulate models with observations.**



original ocean model

adjusted ocean model

Progress

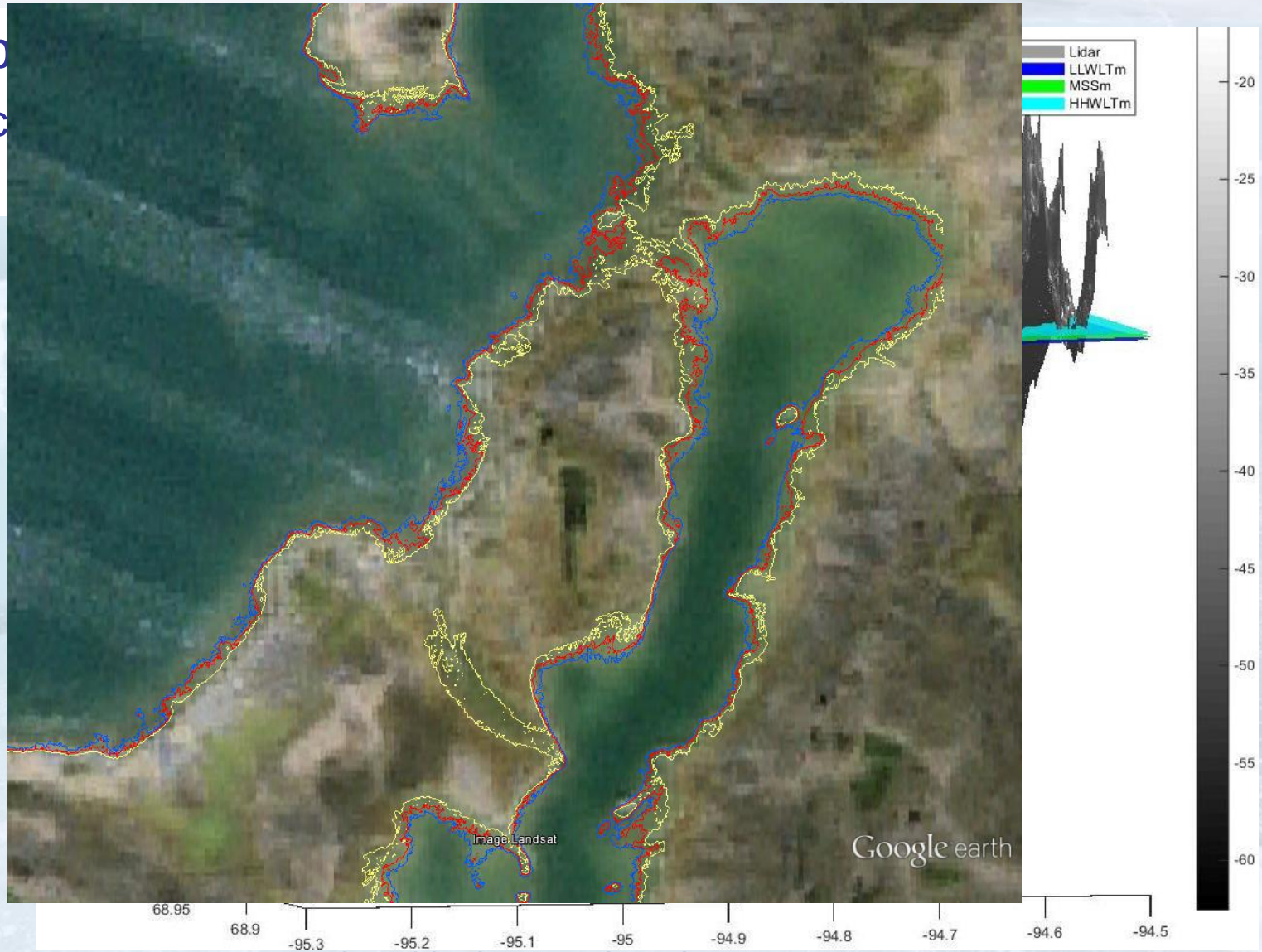
- Modeling began in early 2012.
- First operational HyVSEPs available in 2014, used to reduce data in the Arctic.
- Second version HyVSEPs to be used in all regions for 2015.
- Ongoing tide gauge & GPS campaigns.
- Establish best practices for hydrographers and field validation.

Waterlines for Canada

Intersect b

(bathymetric

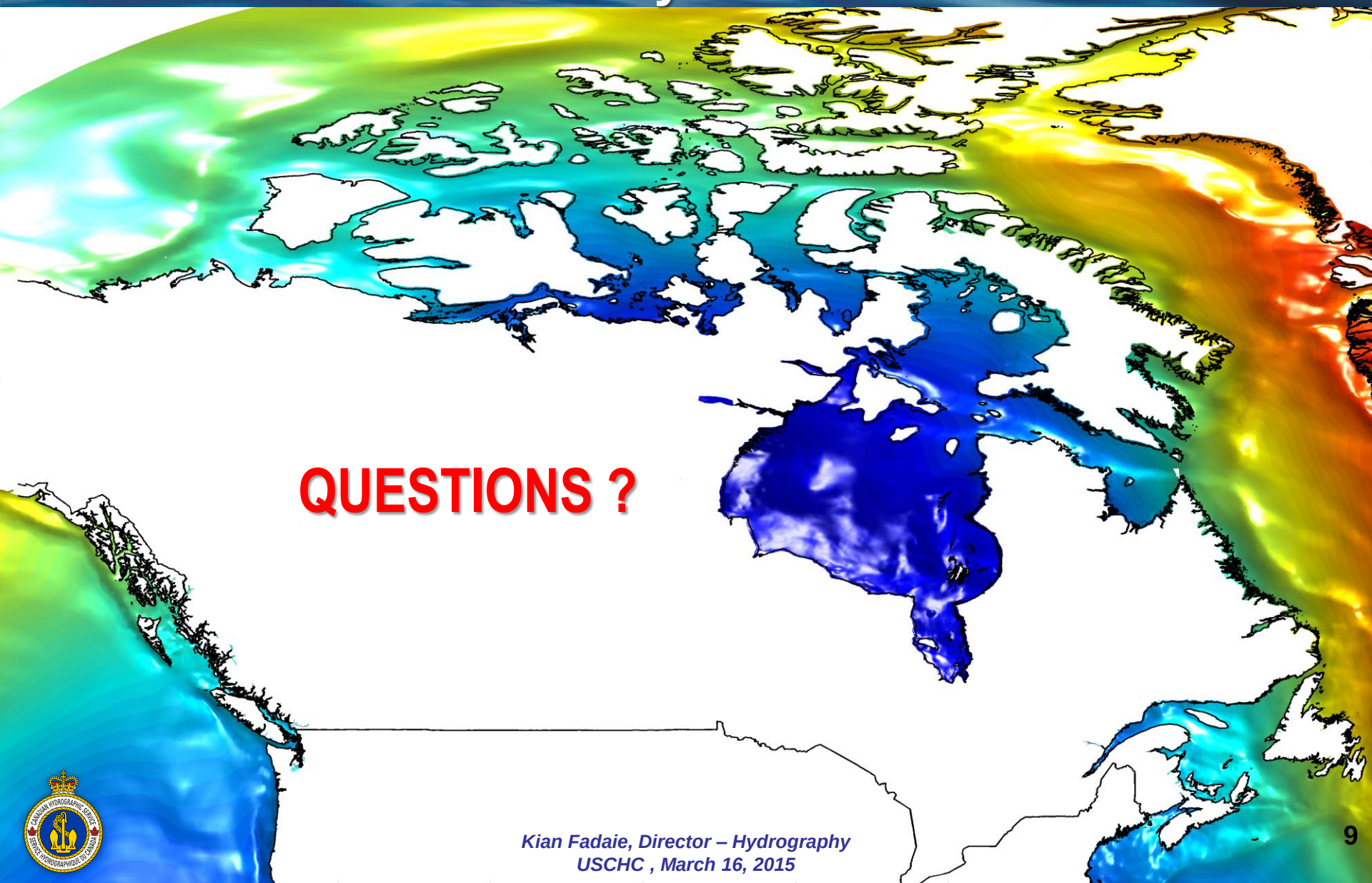
Tide Range



Future Work

- error modeling
- improved methods, tools, and model data
- link to operational oceanography for the World Class Tanker Safety Systems Initiative.
- VDatum: coordinate transformation between MLLW (US observation-based datum) and LLWLT (Canadian prediction-based datum)

Thanks for your attention



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