OCEANS’16 MTS/IEEE Town Hall

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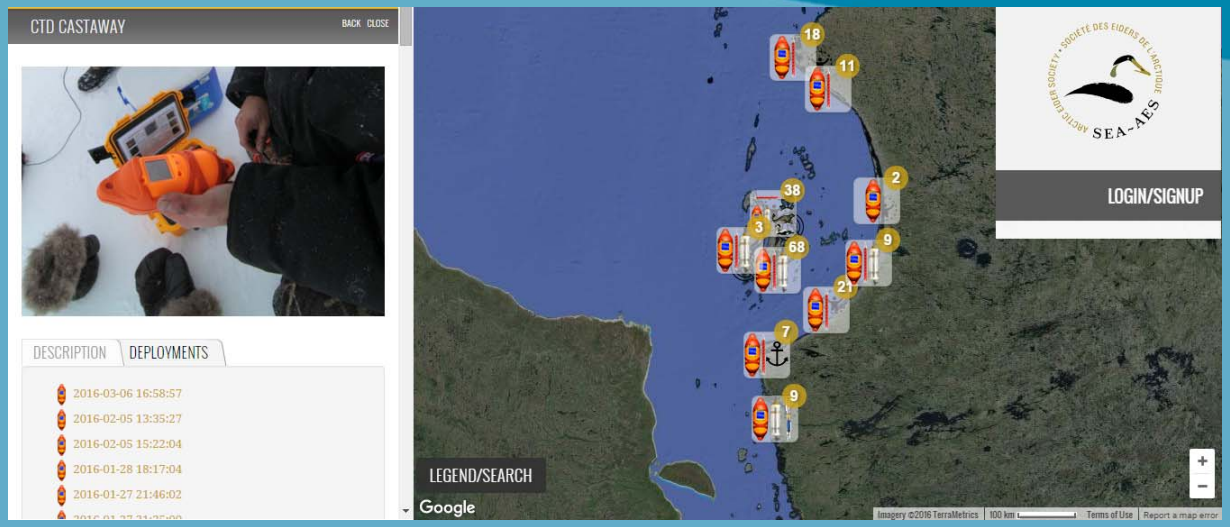
**Arctic Eider Society formed to respond to large entrapments and die-offs of eider ducks in the early 1990's**

**Location: East Hudson Bay - Belcher Islands**

**Inuit Hunters Use CastAway™ CTDs to Gather Data Beneath Hudson Bay Ice**




# Background: Hudson Bay & Arctic Eider Society

- Early 1990s - Hudson Bay Program formed in response to Eider ducks caught in ice after new hydroelectric development
- Early 2000 –Community based monitoring in collaboration with Environment Canada
- 2002 – Landmark agreement allows completion of the second phase of the James Bay Project coincides with Joel Heath first trip to Belcher Islands beginning his Ph.D. research
- 2007-2010 Canada's largest and most successful training, education and outreach programs
- 2011 - Arctic Eider Society formed

# Research Study
# Findings: Development Reversed Cycle

- Hydrologic cycle reversed – electric demand / water release highest in winter
- Freshening surface water freezes at higher temperature, this ice forms and flows much differently than sea ice
- Large entrapments and die-offs of eider ducks caught in ice began in early 1990's
- 2011 – Heath released "People of a Feather" to raise awareness to the challenges faced by the residents of the Belcher Islands
- Arctic Eider Society formed in 2011

Photo credit Arctic Eider Society

# The project - Citizen science
# The vision - Turning the tide

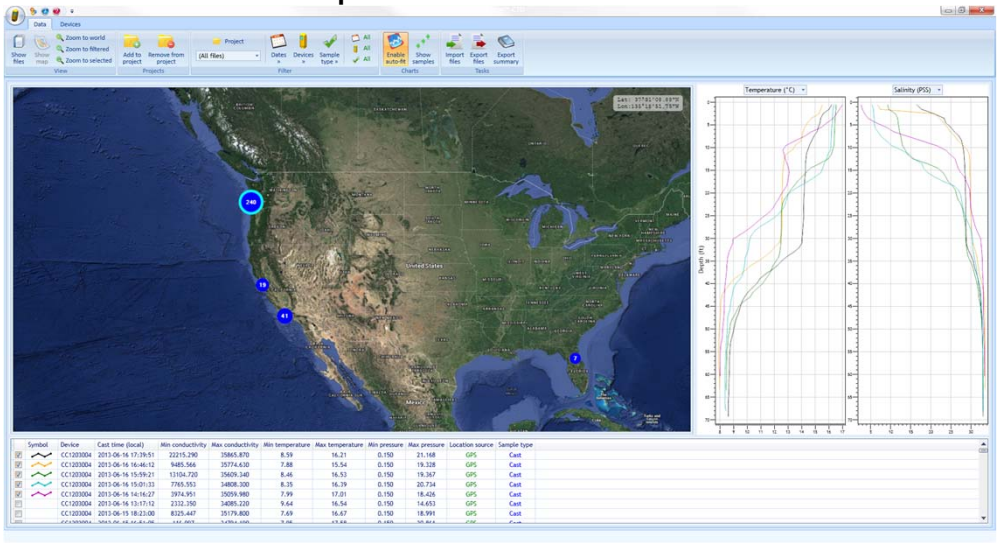
- Community based science
- Outfitted 5 small communities with CastAway CTDs
- Trained hunters to collect & upload data
- Winter 2014-2015 hunters collect over 100 measurements
- Measurements accessible from interactive Google map
- Provide accessible data to researchers, policymakers and science buffs online
- Together regulators / stakeholders focus on solutions to balance society's need for power & repair a severely damaged ecosystem.
- Store / distribute water in step with the natural cycle

# Why the CastAway-CTD?

The CastAway is the smallest, lightest weight, self-contained CTD on the market

Easy to use with built-in **LCD display**, **GPS** and **Bluetooth** standard

- Measures **conductivity, temperature, pressure**
- Bluetooth download - no cables required!
- Geolocation for each measurement
- Memory for 700 profiles
- 40 Hours operation on 2 alkaline AA Batteries





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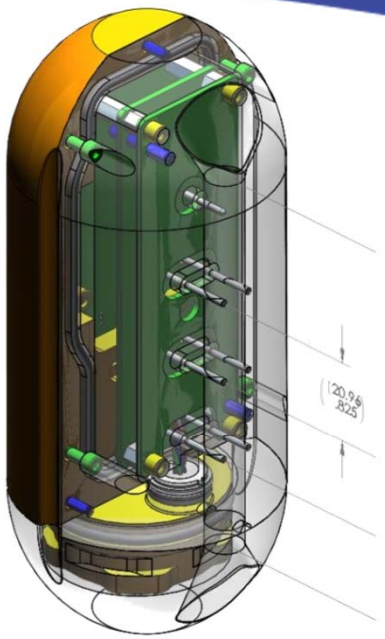
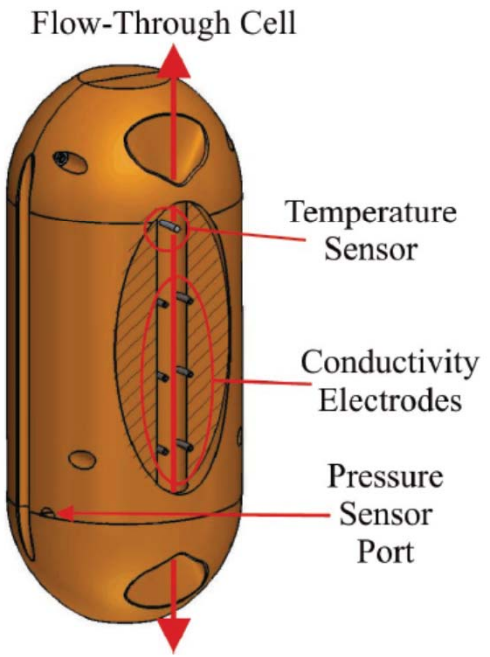
# Summary of features

**Conductivity Cell**

- Fully contained electric field
- 6 electrode design
- Flow-Through Cell
- 1m/sec free fall
- 5Hz Response Time
- 5Hz Sample Rate





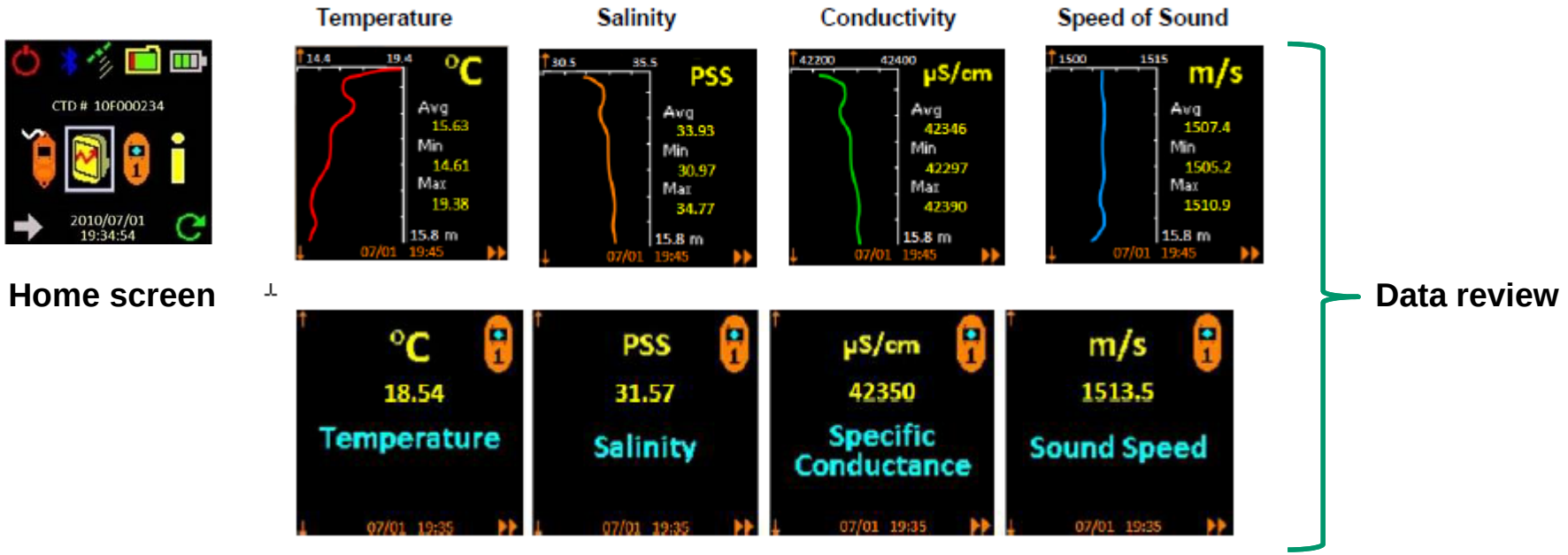

**Temperature sensor (s)**

- Thermistor inside flow-through cell
- Another embedded in housing
- Eliminates the need for thermal isolation

# Built in LCD screen

The CastAway-CTD embedded an LCD screen and magnetic stylus interface.

- Cast and review data without additional electronics.
- No need to bring a computer to the field!



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# Xylem Measures more that just CT

- Acoustic Doppler profilers (ADCPs)  to chart flow patters and boundary currents
- Water quality parameters to determine water source
- Dissolved oxygen, dissolved organic matter and other parameters
- Hydrologic Stations – Discharge – Open Channel Flow –Stage
- Meteorology
- Hydrographic Survey
- Bottom or Sea Floor Observatories
- OceanMet Buoys


Thank You
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