CanCoast: a tool for national coastal mapping and
The Coastal Information System: it's detail-oriented older cousin

G. Manson, P. Fraser and The Team:
N. Couture, D. Forbes, D. Frobel, T. James, K. Jenner,
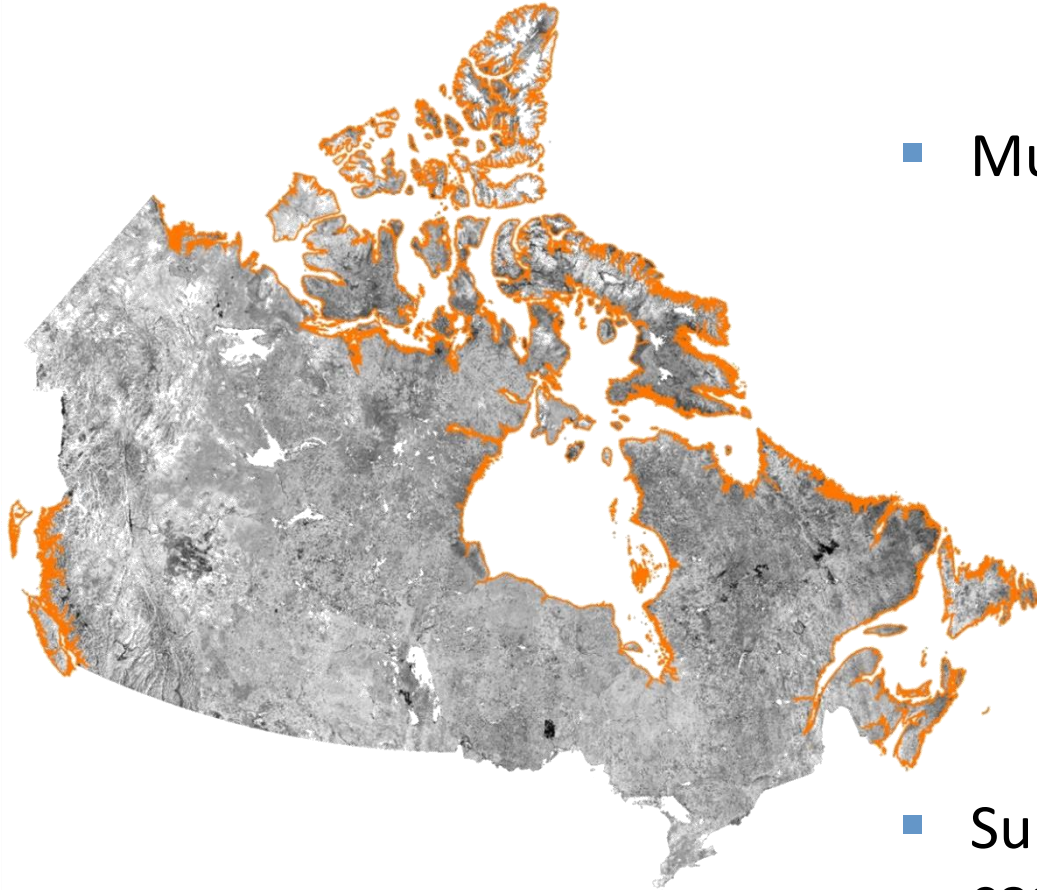C. Smith, B. Szlavko, R. Taylor, D. Whalen

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CanCoast

- National scale digital geodatabase
- Contains digital coastal data
  - Shoreline
  - Thematic attribute layers
- Multi-purpose
  - Assist in climate change adaptation planning
  - Improve knowledge of shoreline variability and change
  - Identify coastal information and data gaps
  - Contribute to sustainable development of marine coasts
  - Potential for access to stakeholders
  - Support coastal modeling research
- Supports other local/regional coastal classification
  - e.g. Coastal Information System

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CanCoast geodatabase

- ArcGIS 9 – FGDC metadata

- Flexible, updatable, queriable

- FREE!

So far…

- Developed shoreline

- Attributed new shoreline with Shaw variables

- Re-calculated sensitivity to sea level change

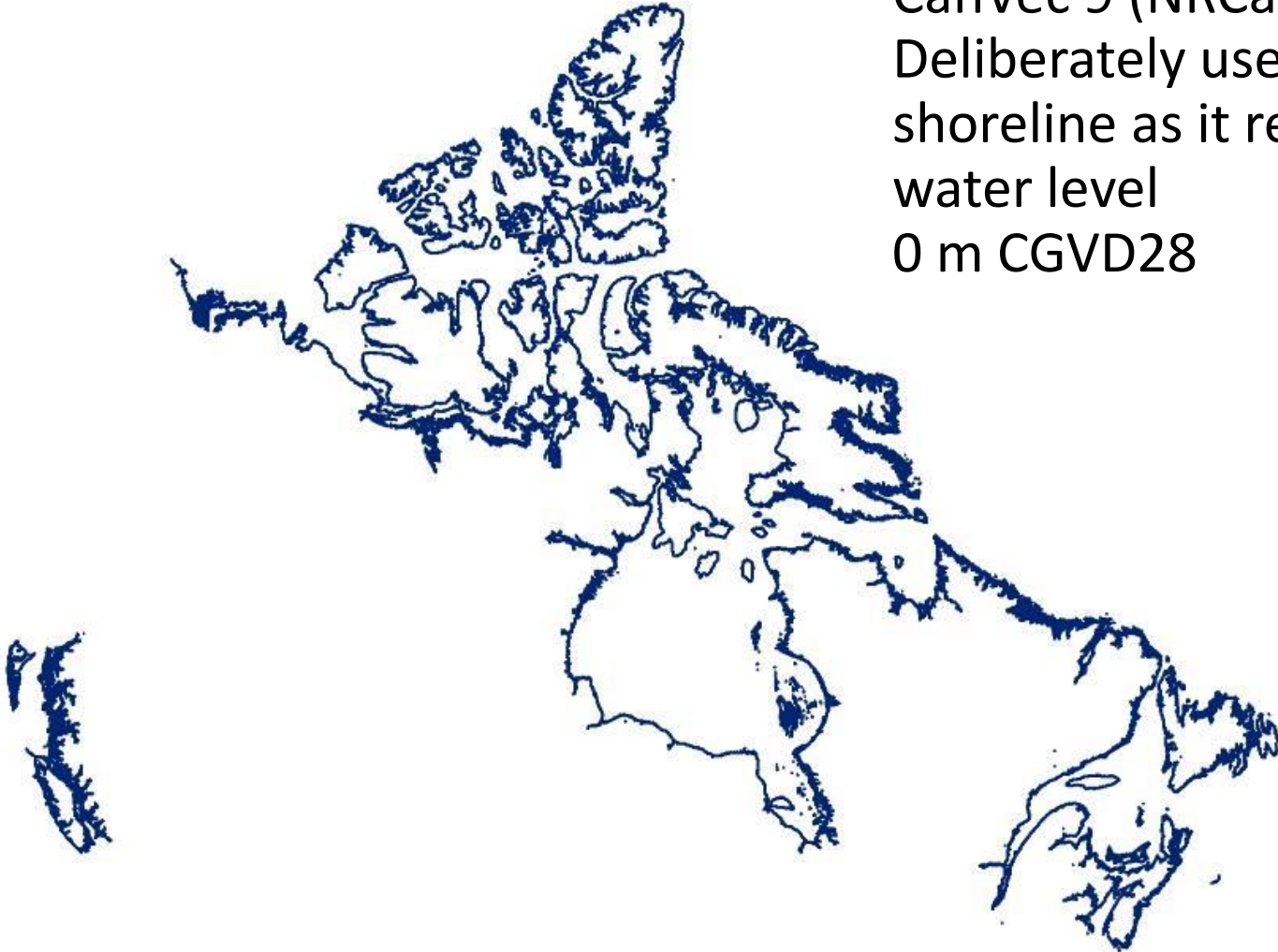- Updating layers, including new layers

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The CanCoast shoreline

- CanVec 9 (NRCan)
  Deliberately use the term shoreline as it represents mean water level
  0 m CGVD28

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Thematic layers

- Thematic layers can be raster or vector (point, line, polygon)
- Existing (from Shaw et al., 1998)
  - Relief, Rock Type, Landform, Sea Level Change, Shoreline Displacement, Tidal Range, Wave Heights, Sensitivity to Sea-Level Rise
- Updated or replaced
  - Relief from 1:50K topo $\Rightarrow$ CDED DEM analysis
  - Rock Type from various $\Rightarrow$ 1:5M Bedrock Geology (Wheeler et al.) and Surficial Geology (Fulton et al.)
  - Tidal Range $\Rightarrow$ updated raster Tidal Range
  - Sea-level rise $\Rightarrow$ updated with modelled data
- Planned updates/replacements
  - Relief $\Rightarrow$ DEM analysis
  - Wave heights $\Rightarrow$ modelled including sea ice
  - Sensitivity to Sea-Level Rise $\Rightarrow$ Sensitivity to Climate Change (or other)
- Planned new themeatic layers
  - Permafrost
  - Socio-economic data (population)

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Nesting Thematic Layers

- CanCoast can accommodate new thematic layers at any scale/level of detail

- Attributes from the new layer are mapped to the CanCoast shoreline

- So far we have been bringing generalised data (e.g. attributes from 1:50K map sheets, or attributes from 1:5M data) into CanCoast

- General strategy is to resegment the CanCoast shoreline to the more general segments and assign attributes

- Now we're trying to work with data at fine resolution (e.g. segments less than 100 m)
- Strategy is the same but the philosophy is different

- Rather than building a nationally consistent thematic layer, where we have better data, nest that within the nationally consistent layer

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Coastal Information System (CIS)

- Contains coastal form and material information for 3 cross shore zones (Backshore, Foreshore, Nearshore).
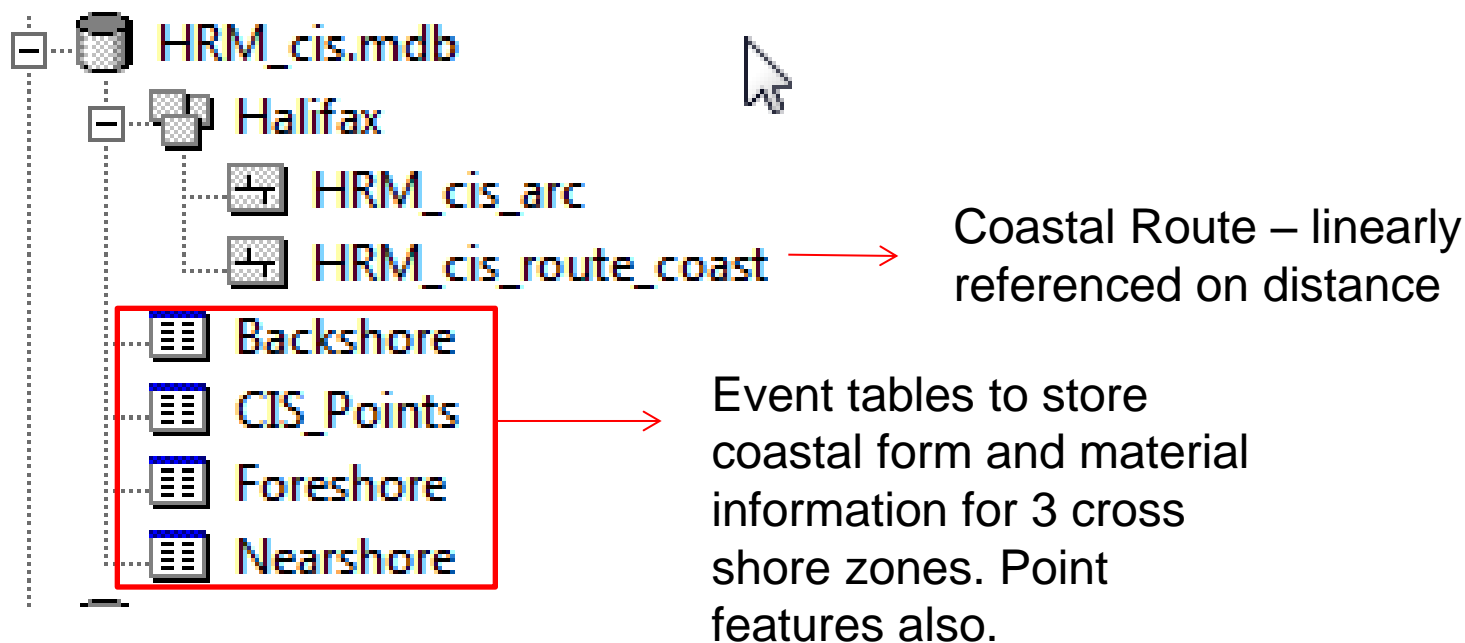
- Classification system is hierarchical.
  - Form Supertype – e.g. Unlithified or Solid
  - Form Type – e.g. beach, slope, flat, cliff, dune, etc.
  - Form Subtype – Steep, Ramping, fringing, barrier, etc.

  - Material information is also hierarchical.

Field Name	Data Type
SOURCE_DATA	Long Integer
B_FORM_SUPERTYPE	Text
B_FORM_TYPE	Text
B_FORM_SUBTYPE	Text
B_FORM_HEIGHT	Text
B_FORM_COMMENTS	Text
B_FORM_FEATURES	Text
B_MAT_SUPERTYPE	Text
B_MAT_TYPE	Text
B_MAT_SUBTYPE	Text
B_MAT_COMMENTS	Text
B_MAT_FEATURES	Text

- Some Datasets contain additional layers (Change Mapping, Ice Features)

- 16 Datasets across Canada – 10 in Atlantic Canada, 6 Arctic.

- Features are mapped primarily from oblique aerial video. Additional sources are satellite imagery, vertical or oblique photos, and ground surveys.

- Data entry is performed in ArcMap 9.3 using an in house custom tool. Entry tool must be updated to run in ArcGIS 10.x

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CIS Data Structure

HRM_cis.mdb
- Halifax
  - HRM_cis_arc
  - HRM_cis_route_coast → Coastal Route – linearly referenced on distance
  - Backshore
  - CIS_Points
  - Foreshore
  - Nearshore

→ Event tables to store coastal form and material information for 3 cross shore zones. Point features also.

CIS Data Entry

CIS Toolbar

Target Layer (Zone)

Entry Tool

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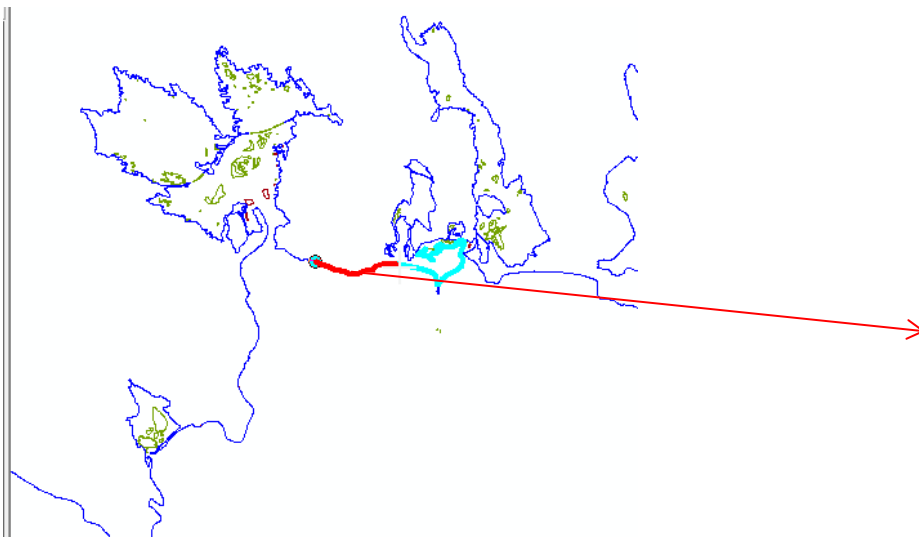
CIS Data Coverage – 16 Datasets

1 – PEI – North Shore

4 – Nova Scotia
   HRM
   Lunenburg
   Shelburne
   Pictou

3 – Newfoundland
   Bonavista
   SE Avalon
   W Musgrave

2 – Labrador
   Voisey's Bay
   Lake Melville

6 – Arctic
   Beaufort Sea
   Cape Parry
   Banks Island
   Coronation Gulf
   Clyde River
   Queen Maud Gulf – (Not Shown)

- Develop a CIS for local/regional project areas
- Currently in separate geodatabases
- Would like to consolidate into the CanCoast framework for analysis

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