



# Extending the Terrestrial Habitat Map to Atlantic Canada

## The Nature Conservancy Eastern Conservation Science



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**Abstract**

The Northeast US and Atlantic Canada share many of the same types of forests, wetlands, and natural communities. From a species perspective, the region is one contiguous forest. However, resources are classified and mapped differently on the two sides of the border creating challenges for species modeling and ecosystem evaluation. To remedy this, ecologists from The Nature Conservancy collaborated with a committee of scientists from various Canadian institutions to produce the first international map of terrestrial habitats for the region. The project used extensive spatial data on geology, soils, landforms, wetlands, elevation and climate. Additionally, all four provinces contributed spatially comprehensive forest inventory data consisting of millions of polygons depicting the exact tree composition of individual forest stands. Furthermore, the Atlantic Conservation Data Centre contributed spatial locations of over 16,000 species locations including herbaceous plants, reptiles, mammals and birds. The resulting map will be integrated with the US map and released as a single dataset in spring 2015. This poster reviews the methods and examines some of the interesting source datasets and findings.

Project supported by The Northeast Climate Science Center, The North Atlantic Landscape Conservation Cooperative, and The Nature Conservancy

### Background

This project grew out of the Northeastern Terrestrial Habitat Classification System, Map, and Habitat Guides which are available at <http://nature.ly/NEHabitat>. The Northeastern Terrestrial Habitat Classification System and Map was developed as a comprehensive and standardized representation of habitats for wildlife that would be consistent across northeastern US states and with other regional classification and mapping efforts. It is based on the ecological systems classification created by NatureServe (Gawler 2008, Comer 2010). These habitat systems are intended to be applicable at medium and large scales, and to supplement the finer-scale approaches used within states for specific projects and needs. To create the habitat guides we aggregated some systems that were ecologically similar across the region into a summary group (e.g., acidic cliffs) and presented basic information about its distribution, securement, and associated plant and animal species. With the completion of the US products in 2013, a number of northeastern partners began exploring the possibility of extending the map and products to Atlantic Canada which shares many of the same habitats and species.



**Habitat Guide and Example Page: Acadian Sub-boreal Spruce Flat**

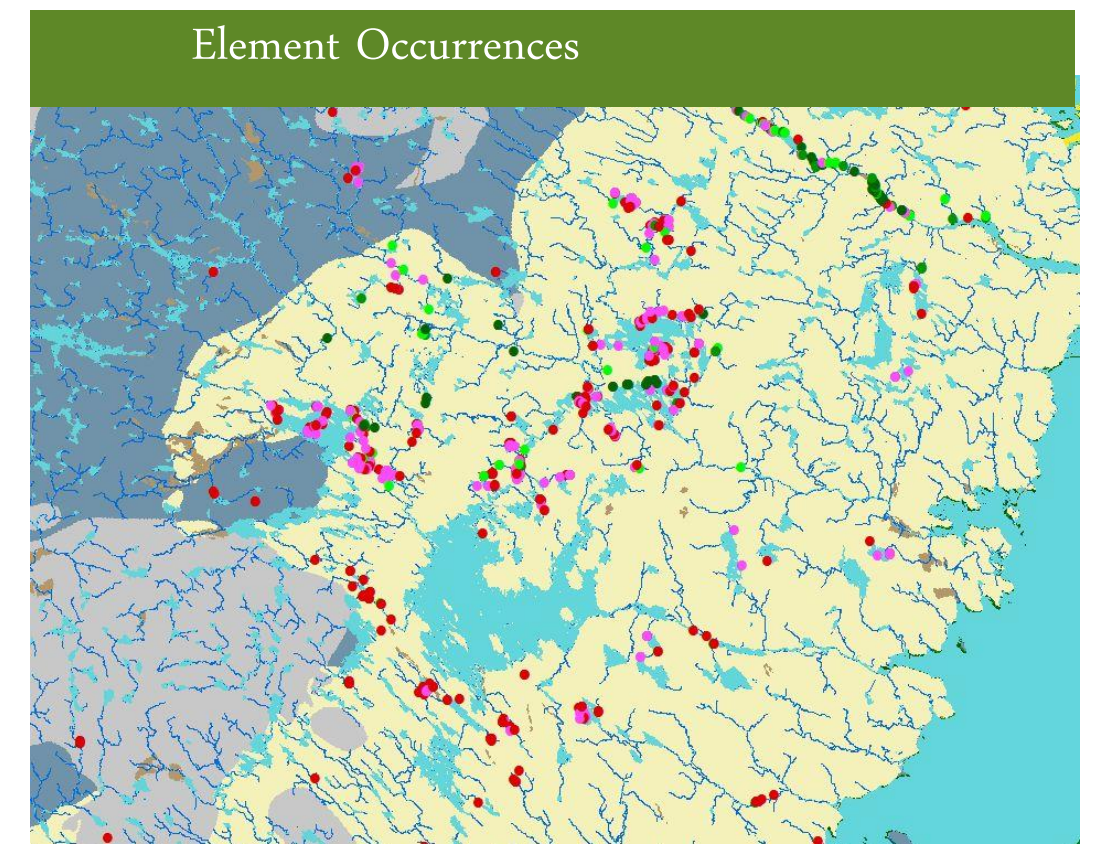
### Canadian Partnership and Review

**Steering committee**

This project was guided by a steering committee of over 40 members representing U.S. federal, state, provincial, and NGO organizations. We gathered immense amounts of data to support this mapping project from federal and (especially) provincial agencies in the project area, and from partner conservation NGOs. In addition, a team of Canadian ecologists offered invaluable information and advice on the habitat classification and how to map it. Our classification team, for example, described five new broadly occurring upland forest ecological systems (Table 1 in yellow) that would need to be mapped to reflect differences in climate, biogeography, and forest condition between the northeastern US and the Canadian study area. They also helped us understand how definitions and descriptions for some of the systems that had been mapped in the US would have to be expanded or modified to accommodate variants and analogs in Canada (Table 1 in gray).

Table 1. Example of Mesic Hardwood and Conifer Forest Types

MACROGROUP	ECOLOGICAL SYSTEM
Northern Mesic Hardwood & Conifer Forest	Acadian Sub-boreal Spruce Flat
Northern Mesic Hardwood & Conifer Forest	Laurentian-Acadian Pine-Hemlock-Hardwood Forest
Northern Mesic Hardwood & Conifer Forest	Laurentian-Acadian Northern Hardwood Forest
Northern Mesic Hardwood & Conifer Forest	Acadian Low Elevation Spruce-Fir-Hardwood Forest
Eastern North American Boreal Forest	NEW - Boreal Highland / Northern Balsam Fir
Northern Mesic Hardwood & Conifer Forest	NEW - Cold Temperate Northern / Higher Elevation Conifer Forest
Northern Mesic Hardwood & Conifer Forest	NEW - Cold Temperate Coastal Conifer Forest
Northern Mesic Hardwood & Conifer Forest	NEW - Early Seral (Intolerant) Conifer Forests
Northern Mesic Hardwood & Conifer Forest	NEW - Early Seral (Intolerant) Hardwood and Mixedwood Forests

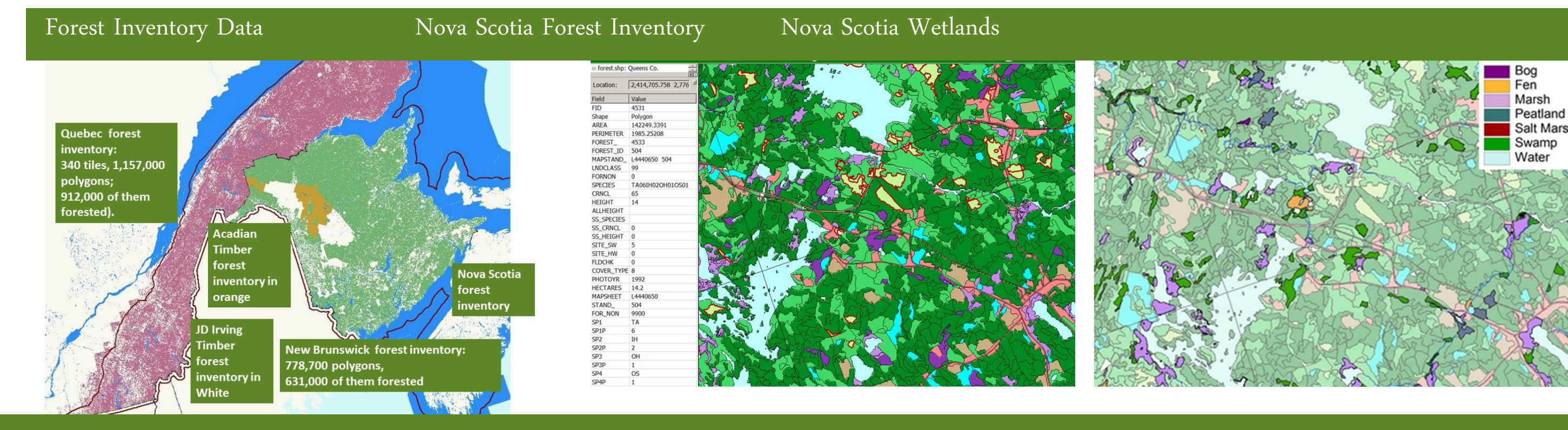


**Species Occurrences**

We used a comprehensive spatial database of species occurrences from the Atlantic Canada Conservation Data Centre (ACCDC) to help in habitat model-building. In the map on the right, wetland plant species are shown as points with red and pink indicating acidic conditions and green denoting richer conditions for an area of till plain in southwestern Nova Scotia, against a backdrop of bedrock geology types.

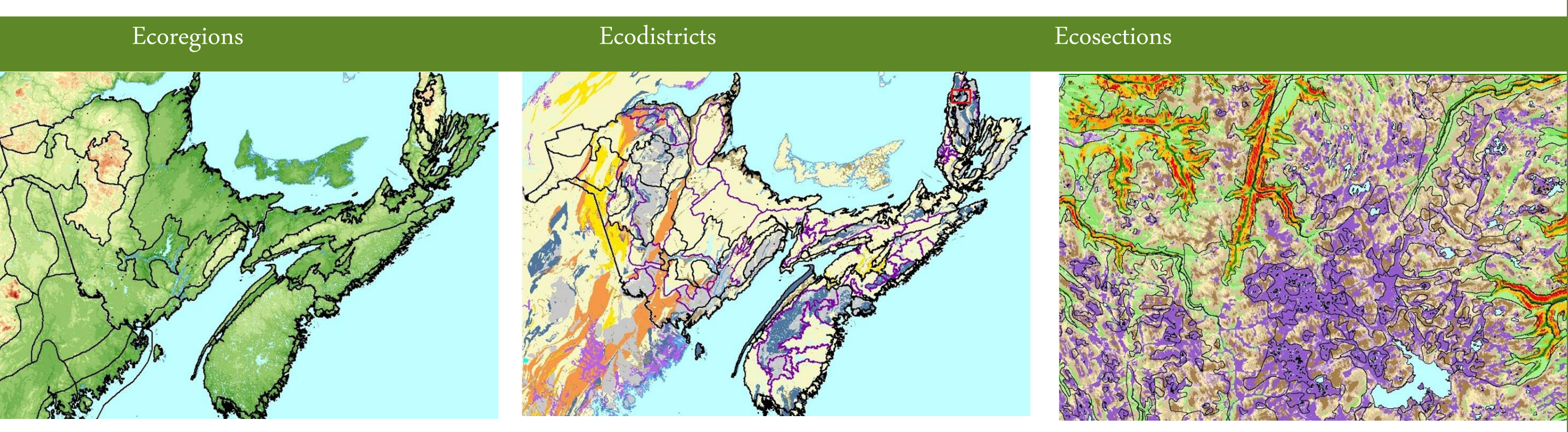
**Forest Inventory Data**

Critical to our mapping effort were the detailed forest/landcover inventories from the natural resource agencies in each of the four provinces and from three timber companies active in New Brunswick. These datasets, built primarily as silvicultural and resource management tools, all gave some indication of the overstory composition of forested stands, stand development stage, and management history, as well as the nature of non-forested patches and larger areas. We supplemented this information with data on ecological setting (soils, wetlands, topography, climate, elevation, geology) from provincial and federal sources (and some compiled in-house) as well as information on species distributions to construct models for the upland and wetland, matrix and smaller patch habitats in the classification.

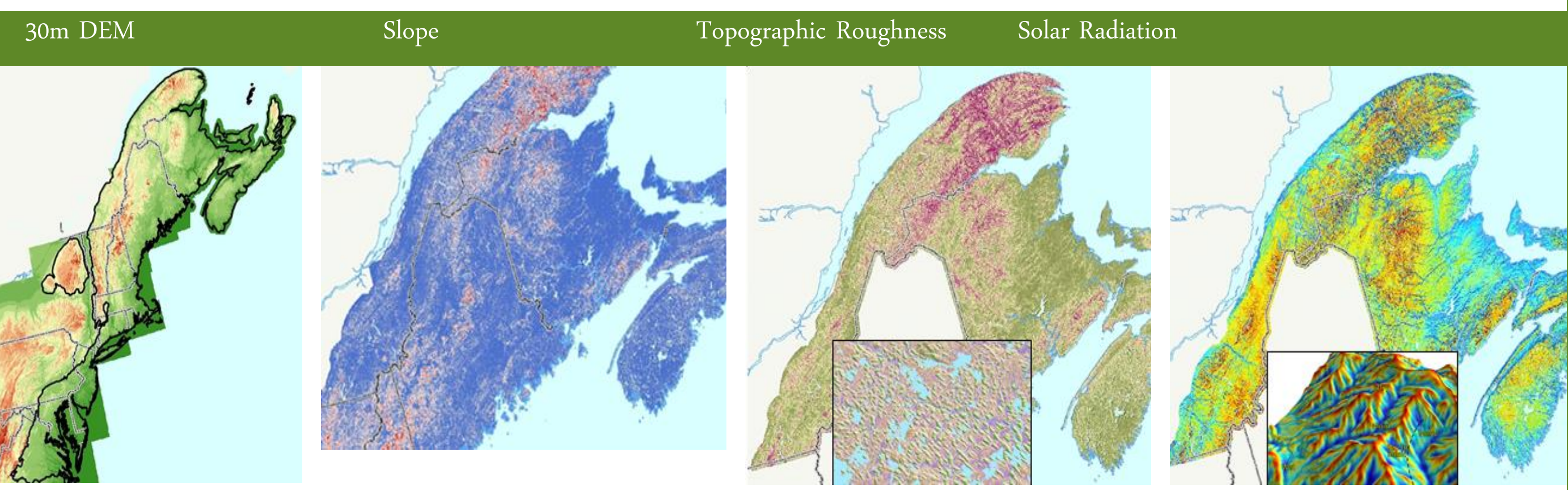


### Foundation Data: Region-wide Datasets

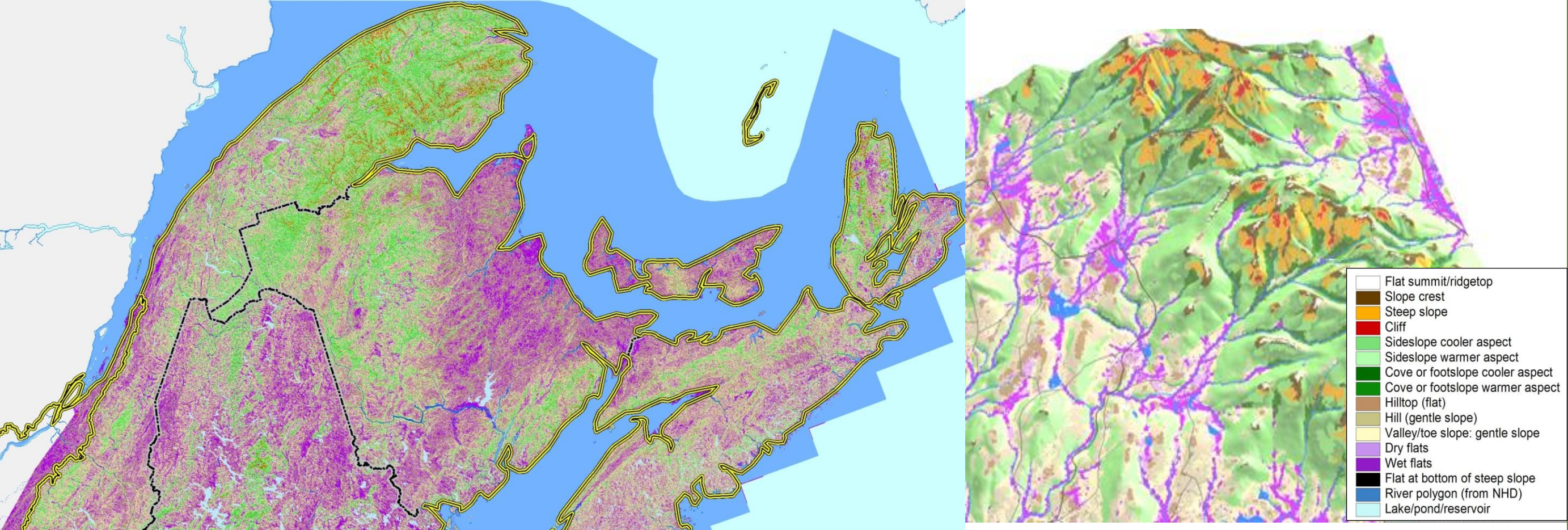
#### Ecological land classification



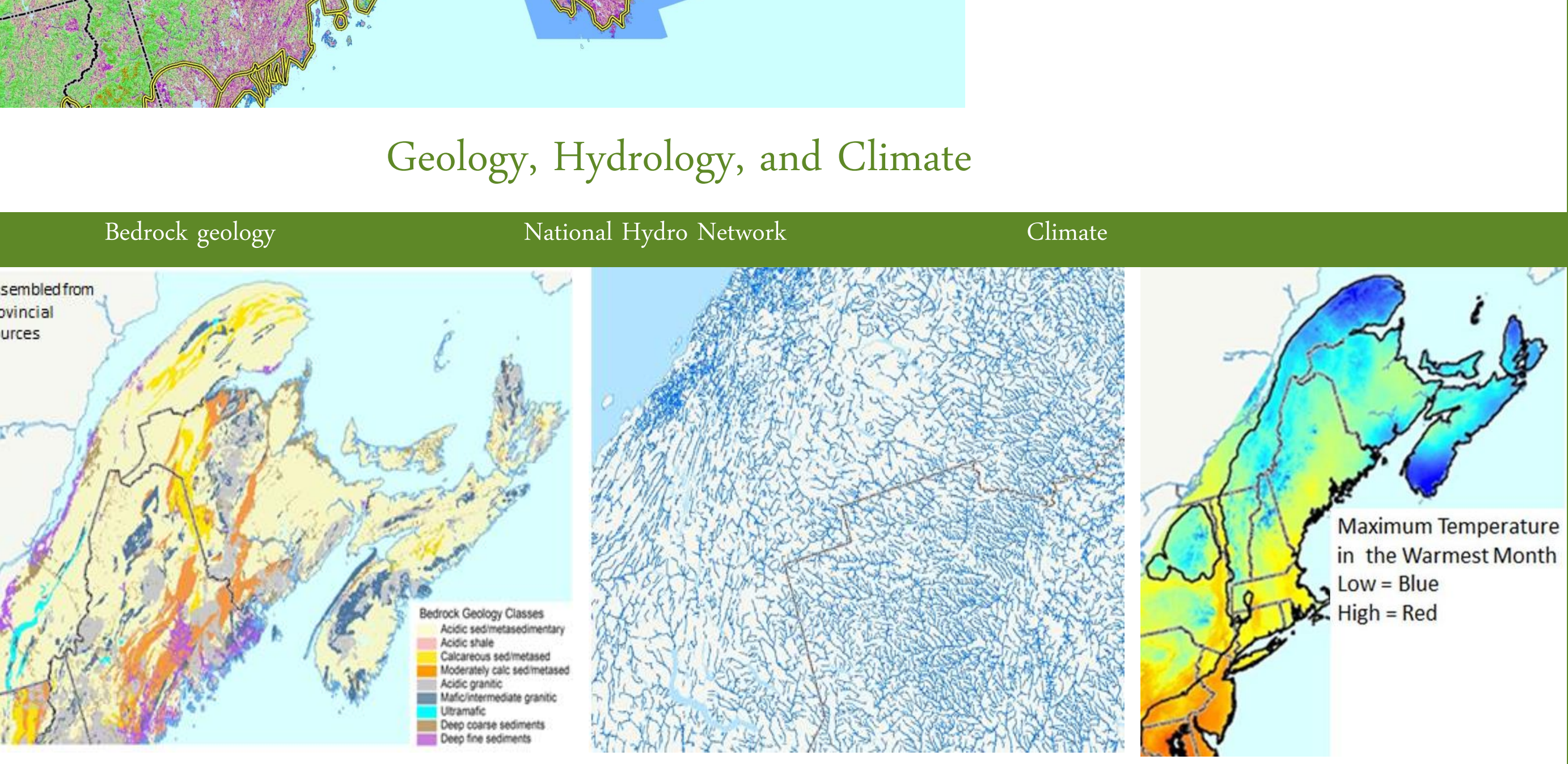
#### Digital Elevation Model and Derivatives



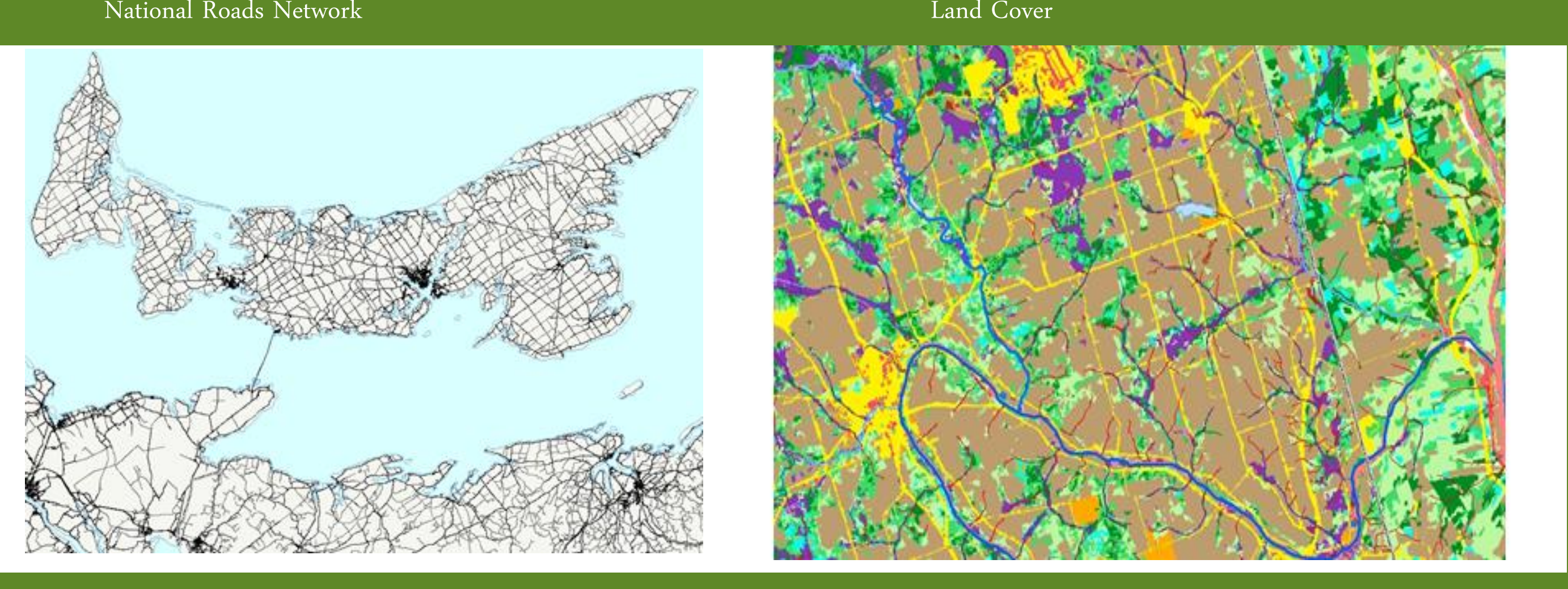
#### Landforms



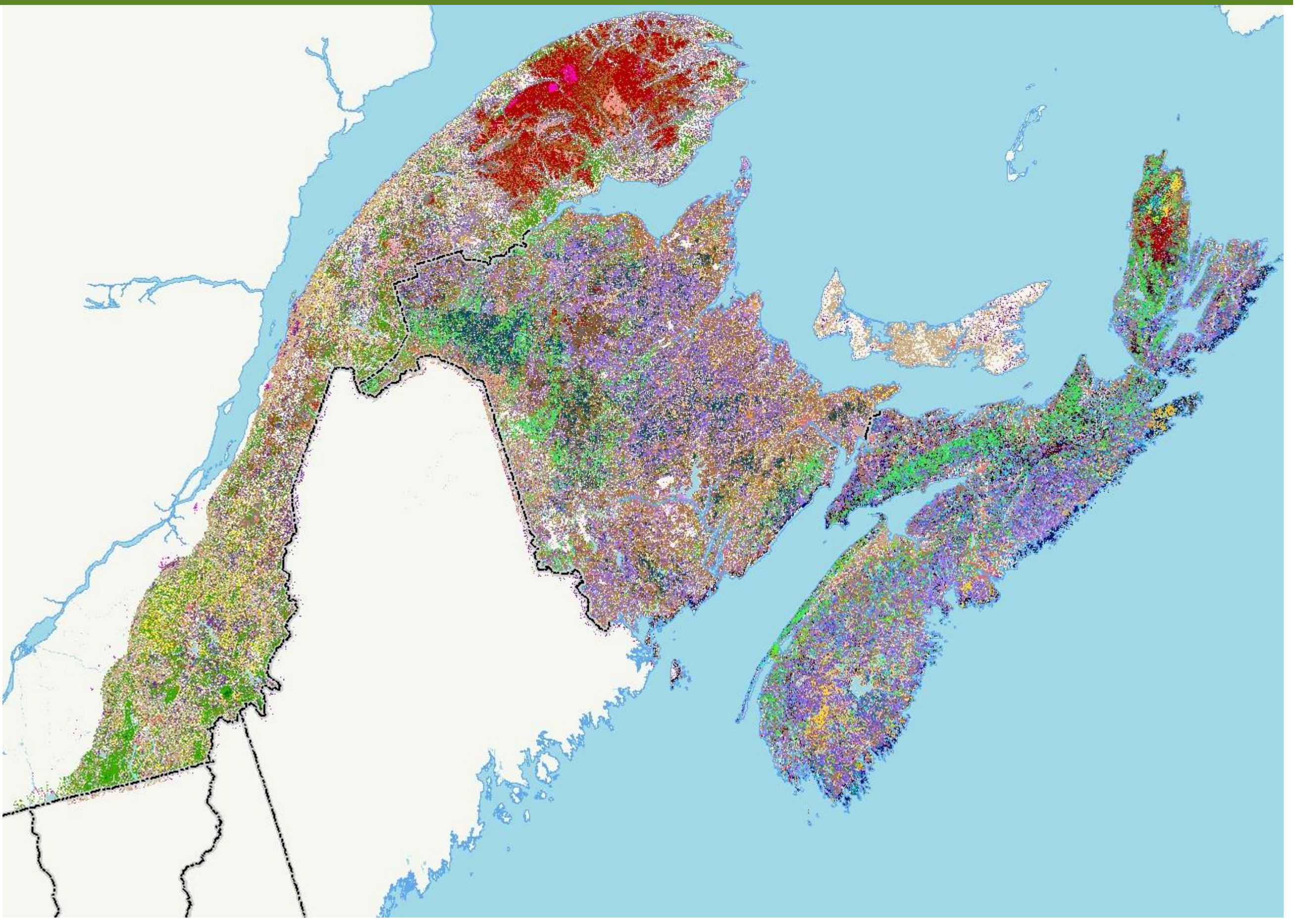
#### Geology, Hydrology, and Climate



#### Anthropogenic impacts



### Results



A total of 41 habitat types/ecological systems have been mapped in the project area. Of the 12 matrix and large patch upland forest systems, five do not occur south of the US border, including two early seral habitat types that detailed provincial forest inventories enabled us to map. Those data also made it possible to map plantations and old field habitats separately. Fourteen smaller patch systems were mapped, including cliffs and talus slopes, rocky or heathy outcrops, maritime and karst forests, beach/dune systems, and a few forest or woodland types characteristic of more southern climates that reach their northern extremity in southeastern Canada. The 14 wetland habitats that occur in the project area include eight types of swamps and marshes that are largely fed by groundwater and surface water, four peatland systems at least partly isolated from the influence of groundwater, and two types of coastal salt marshes.

