



NOTE ON ECO-CLASSIFICATION SYSTEMS FOR CANADA

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A Spatial Basis for Reporting on Geochemical Background

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- A spatial foundation for interpreting and reporting on geochemical background concentration is needed.
- Eco-classifications systems provide a basis for the expression of background values.
- Other starting points are bedrock geology, surficial geology, etc.



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Key Points in Ecological Classification

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Source: Marshall and Schut (1999)

- Ecological Land Classification incorporates all major components of ecosystems: air, water, geology, soil, and biota, including humans.
- It is based on a hierarchy with ecosystems nested within ecosystems.
- It involves integration of knowledge and is not simply an overlay process.
- It recognizes that map lines generally depict the location of zones of transition.



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- Source: Marshall et al., (1996) and Marshall and Schut (1999), A national ecological framework for Canada – overview; On-line at <http://sis.agr.gc.ca/cansis/nsdb/ecostrat/intro.html>
- Late 1960s - Recognition of the need for an nation-wide ecological framework to provide standardized, multi-scale geographical reporting and monitoring units.
- 1976 - The Canada Committee on Ecological Land Classification was created to develop (1) a uniform national ecological approach to terrestrial ecosystem classification and mapping and (2) to encourage use of the ecological approach to sustainable resource management and planning. First version - 7 levels of generalization and also spatial units that needed revisions.



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- 1991 - a collaborative project was undertaken after the first State of Environment report for Canada published in 1986 by some federal, provincial and territorial governments to revise the previous work and establish a common ecological framework for Canada.
- 1996 - Working group focused on 3 levels - ecozones, ecoregions, and ecodistricts and resulted in the national report "A National Ecological Framework for Canada" released by the Ecological Stratification Working Group
- Report described the methodology used to construct the ecological framework maps, the concepts of the hierarchical levels of generalization, narrative descriptions of each ecozone and ecoregion and their linkages to various data sources.



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A NATIONAL ECOLOGICAL FRAMEWORK FOR CANADA



Centre for Land
and Biological Resources Research
Centre de recherches sur
les terres et les ressources biologiques



State of the Environment
Directorate
Direction générale de l'état
de l'environnement

Canada 

The revised ecozones
and ecoregions were
used for the State of
Environment Report
1996.



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SINCE 1996:

- Provincial: More in-depth descriptions for BC (1996), SK (1998), MB (1998), NS (1999).
- Federal : A Perspective on Canada's Ecosystems (1996) by the Canadian Council on Ecological Areas (CCEA) - provides a country wide, in-depth description of Canada's terrestrial ecozones.
- International: 1997 - Ecological Regions of North America - Towards a Common Perspective - by the NAFTA Commission for Environmental Cooperation (CEC), provides the integrated, continental perspective.



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SINCE 1996:

- Federal: 1998 - As the North America perspective (last slide) was being developed, an ecoprovince level of generalization, between ecozone and ecoregion, was compiled for the Canadian framework (Marshall et. al. 1998).
- 1999 - a revised and expanded attribute database (Marshall et. al. 1999), replaced the earlier version (Selby and Santry, 1996). It includes attribute data for the ecoprovince level of generalization.



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State of the Environment Reporting spatial framework maintained by the CANSIS group at Agriculture and Agri-Food Canada (referred to hereafter as the CanSIS system)

- Ecozones – 15; Ecoprovinces – 53; Ecoregions - 194; Ecodistricts - 1021.

Commission for Environmental Cooperation (CEC) for North America

- Level 1 – 15; Level 2 – 52; Level 3 – 182; Level 4 - ?



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CanSIS Ecozones and CEC Level 1

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CanSIS system – 15 terrestrial ecozones for Canada



CEC Level 1 – fewer Level I regions for Canada



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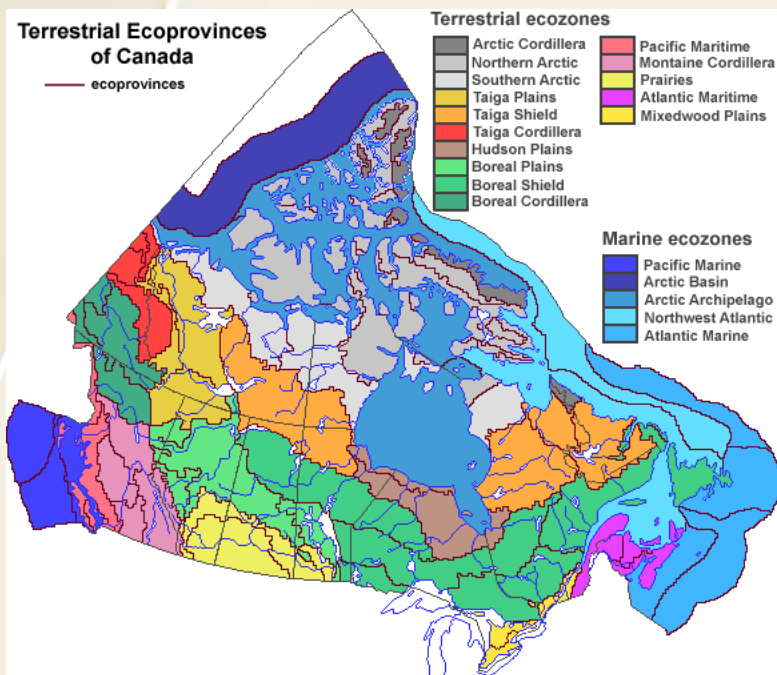
Canada



CanSIS Ecoprovinces and CEC Level II

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CanSIS Ecoprovinces



Source: Ecoprovinces

http://geogratis.cgdi.gc.ca/Ecosys/tem/1_ecosys/ecogifs/ecoprov.gif

Source: CEC Level II

<ftp://ftp.epa.gov/wed/ecoregions/na/naeco2.pdf>

CEC Level II



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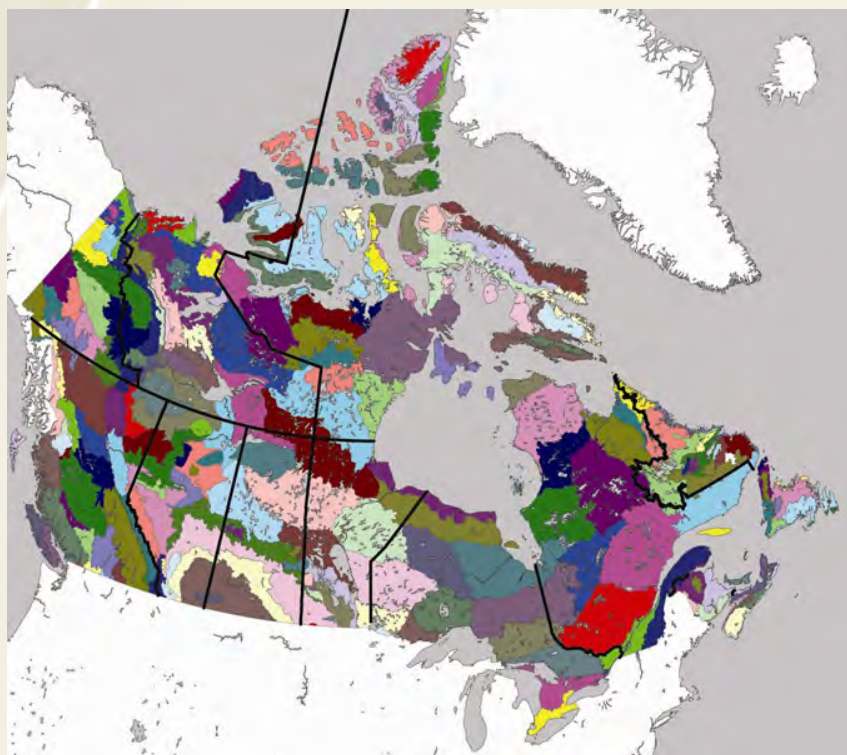
Canada



CanSIS Ecoregions and CEC Level III

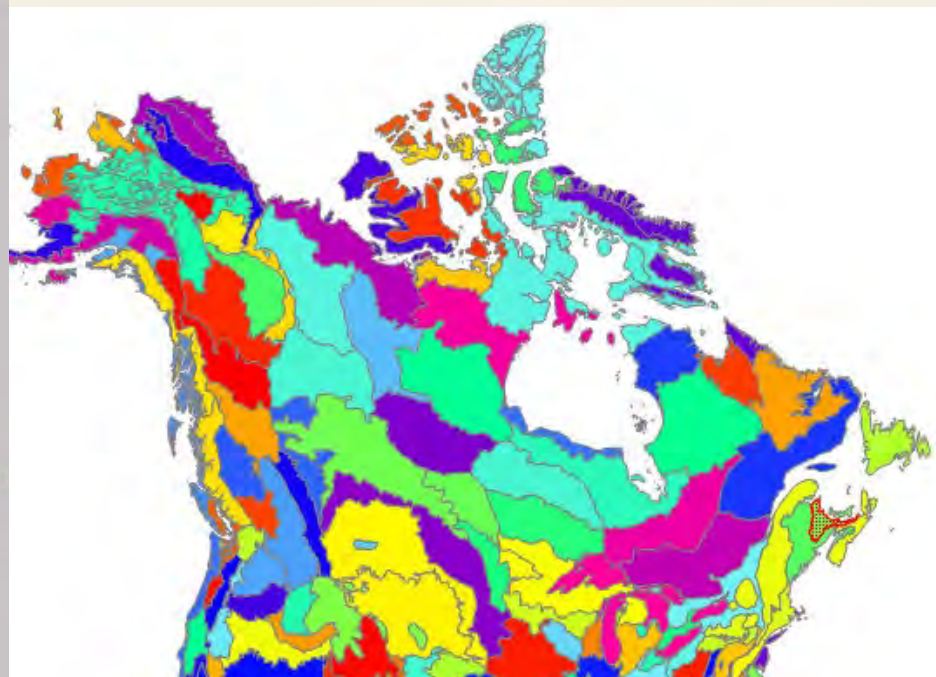
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CANSIS Ecoregions



CanSIS system – 194 ecoregions
for Canada

CEC Level III



Fewer Level III regions for Canada



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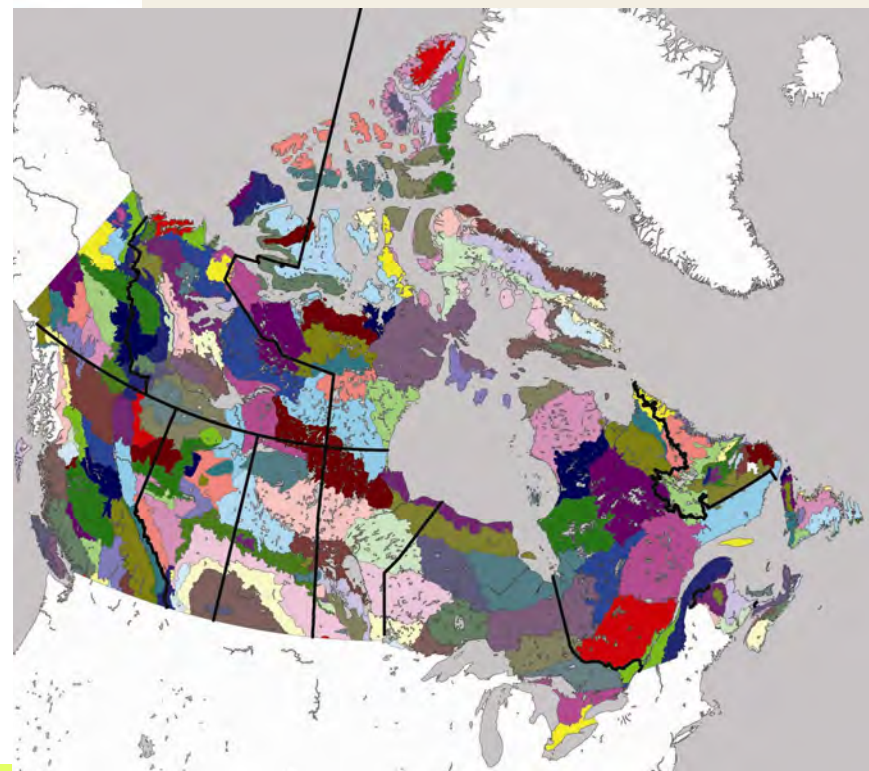
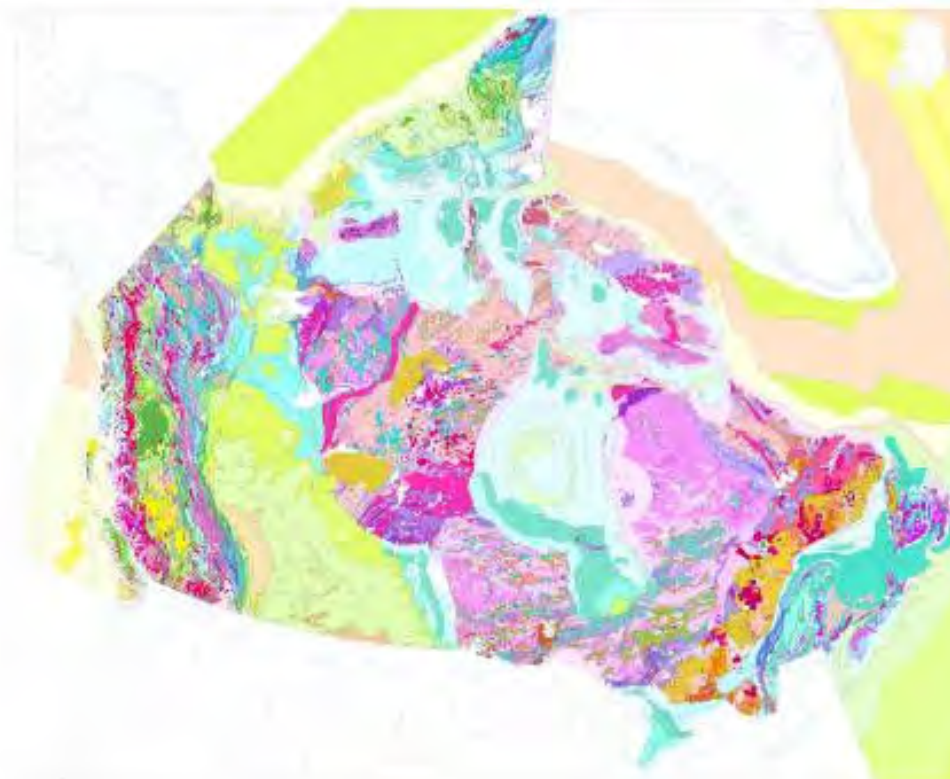
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Comparison of Bedrock Map and CanSIS Ecoregions

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Source: Ecoregions:: CanSIS database
Source: Bedrock: GSC Map 1860A (1: 5 000 000)



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CanSis Ecodistricts for the Maritimes

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Recommendations

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- Geochemical data sets that are geo-referenced can be “cookie cut” using any eco-classification system and GIS.
- Numerous systems, somewhat similar but not identical. Clearly state the system you are using.
- The scale used depends on the project purpose and the amount of data available
- The CanSIS system is widely used in Canada for national and regional reporting.
- CEC system is used for international reporting.
- If using the more detailed scales of eco-classification information, it is necessary to have sufficient data points within the individual ecosystem polygons to ensure the validity of statistical comparisons.



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Bedrock Maps

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