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Environmental Thematic Maps and Graphics

Accounting for ecosystem change, 2021

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Accounting for ecosystem change, 2021

Canada is a vast country with a wide variety of terrestrial, marine and coastal ecosystems shaped by varying characteristics. The country is bordered by three oceans, which have an important role in both the culture and economy of several provinces and territories. Changing climate patterns have an impact on ecosystem condition and functioning.

This product provides thematic maps associated with *Human Activity and the Environment, 2021,* covering various aspects of ecosystem accounts, including ecosystem extent and condition. The maps are based on the principles of ecosystem accounting as described in the Canadian System of Environmental Economic Accounting – Ecosystem Accounts and use multiple datasets from a variety of sources. For details of the methodology behind these maps please see Appendix A of *Human Activity and the Environment 2021: Accounting for ecosystem change in Canada*.

Data are recorded by ecoprovince,[1] by drainage region[2] and by marine ecoregion,[3] which are labelled on the map (Table 1).

Land extent and landscape condition maps

This group of maps shows the location and extent of different ecosystems and average climate characteristics by ecoprovince, including temperature, precipitation, evapotranspiration and potential evapotranspiration. Also included are maps showing average annual water yield (an estimate of renewable freshwater production), forest fire and forest harvesting areas, maps presenting indicators illustrating cumulative effects of human activity on the terrestrial landscape and freshwater ecosystems, and terrestrial and marine areas of the country that are conserved through protected areas and other effective area-based conservation measures.

- Terrestrial and freshwater ecosystem extent
- Average annual temperature, by ecoprovince, 1979 to 2016
- Average annual precipitation, by ecoprovince, 1979 to 2016
- Average annual evapotranspiration, by ecoprovince, 1979 to 2016
- Average annual potential evapotranspiration, by ecoprovince, 1979 to 2016
- Average annual water yield per area, by ecoprovince, 1971 to 2014
- Forest fire and harvesting
- Human landscape modification index, 2011
- Human landscape modification index, highly modified regions, 2011
- Human freshwater landscape influences index, by drainage region
- Protected and conserved area extent, by ecoprovince and marine ecoregion depth class, 2020

Marine and coastal maps

The second group of maps relates to marine and coastal ecosystems within Canada's exclusive economic zone (EEZ). The first five maps show depth classes and elevation features, selected ecosystems, substrates and anthropogenic modifications in Canada's marine ecoregions. Also included is a map of Canada's fishery sector-

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[1] An ecoprovince is a subdivision of an ecozone characterized by major assemblages of structural or surface forms, faunal realms, vegetation, hydrology, soil and macro climate. There are currently 53 ecoprovinces covering the country and they are part of the Ecological Land Classification.

[2] Statistics Canada groups 974 sub-sub-drainage areas representing all land and interior freshwater bodies into 25 drainage regions. These drainage regions can be further grouped according to their outflow into one of 5 ocean drainage areas: the Pacific Ocean, Arctic Ocean, Gulf of Mexico, Hudson Bay or Atlantic Ocean. This geography is a variant of Statistics Canada's official classification of drainage areas, the Standard Drainage Area Classification (SDAC) 2003.

[3] Marine ecoregions are ecologically-defined bioregions that cover Canada's oceans. Spatial files are located at: Fisheries and Oceans Canada, 2016, *Federal Marine Bioregions*, https://open.canada.ca/data/en/dataset/23eb8b56-dac8-4efc-be7c-b8fa11ba62e9 (accessed January 29, 2019). Note that maps with a detailed US coast line use a shapefile from the United States Census Bureau, 2018, "cb_2018_us_state_500k.zip," *Cartographic Boundary Files-Shapefile*, https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.html (accessed February 1, 2021).

based communities. The final series of maps show sea surface temperature and salinity changes within Canada's EEZ, by depth class in each ecoregion and at a quarter degree grid.

- Marine and coastal extent by depth class, elevation features and marine ecoregion
- Marine and coastal extent, ecosystems and substrate
    - Northern British Columbia Coast
    - Southern British Columbia Coast
    - Gulf of St. Lawrence
- Marine and coastal modifications: aquaculture sites and oil licenses, circa 2016 to 2020
- Population size and variation of 2016 fishing and seafood sector-based communities, Pacific and Atlantic coasts, 2001 to 2016
- Average sea surface temperature departures (2005 to 2017) from the climate normal, by marine ecoregion and by quarter degree grid
    - Annual and all seasons
    - Annual
    - Spring
    - Summer
    - Fall
    - Winter
- Average sea surface salinity departures (2005 to 2017) from the climate normal reference period, by marine ecoregion and by quarter degree grid
    - Annual and all seasons
    - Annual
    - Spring
    - Summer
    - Fall
    - Winter

Ecosystem change maps

The third group of maps highlights some of the changes that ecosystems have experienced over time. The first seven maps represent the long-term trend of temperature departures (1948 to 2016) from the 1961 to 1990 climate normal. Also included are six maps showing annual and seasonal precipitation change over the period from 1979 to 2016. The final map shows the annual total water storage change, which is an estimate of water stored in the environment as groundwater, soil moisture, surface water, snow and ice.

- Temperature change, by ecoprovince, 1948 to 2016
    - Annual and all seasons
    - Annual
    - Spring
    - Summer
    - Fall
    - Winter
- Winter temperature increase greater than 5°C, northwestern Canada, 1948 to 2016
- Precipitation change, by ecoprovince, 1979 to 2016
    - Annual and all seasons

  - Annual
  - Spring
  - Summer
  - Fall
  - Winter
- Annual total water storage change, by ecoprovince, 2002 to 2016

Table 1.1
Geography

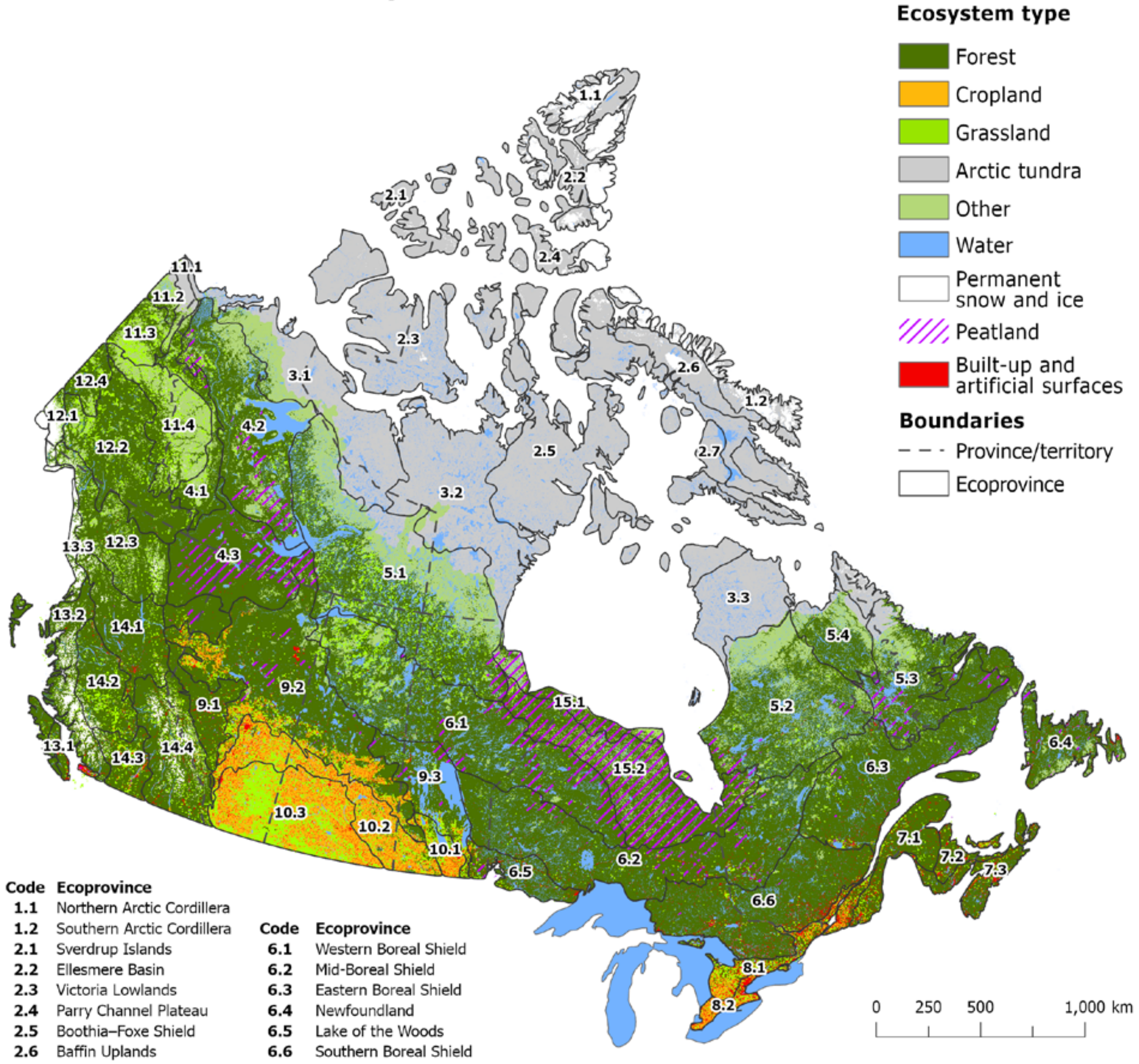
Ecoprovince	Code	Ecoprovince	Code
Northern Arctic Cordillera	1.1	Fundy Uplands	7.3
Southern Arctic Cordillera	1.2	Great Lakes–St. Lawrence Lowlands	8.1
Sverdrup Islands	2.1	Huron–Erie Plains	8.2
Ellesmere Basin	2.2	Boreal Foothills	9.1
Victoria Lowlands	2.3	Central Boreal Plains	9.2
Parry Channel Plateau	2.4	Eastern Boreal Plains	9.3
Boothia–Foxe Shield	2.5	Eastern Prairies	10.1
Baffin Uplands	2.6	Parkland Prairies	10.2
Foxe–Boothia Lowlands	2.7	Central Grassland	10.3
Amundsen Lowlands	3.1	Northern Yukon Mountains	11.1
Keewatin Lowlands	3.2	Old Crow–Eagle Plains	11.2
Ungava–Belcher	3.3	Ogilvie Mountains	11.3
Mackenzie Foothills	4.1	Mackenzie–Selwyn Mountains	11.4
Great Bear Lowlands	4.2	Wrangel Mountains	12.1
Hay–Slave Lowlands	4.3	Northern Boreal Cordillera	12.2
Western Taiga Shield	5.1	Southern Boreal Cordillera	12.3
Eastern Taiga	5.2	Western Boreal Cordillera	12.4
Labrador Uplands	5.3	Georgia Depression	13.1
Whale River Lowland	5.4	Southern Coastal Mountains	13.2
Western Boreal Shield	6.1	Northern Coastal Mountains	13.3
Mid-Boreal Shield	6.2	Northern Montane Cordillera	14.1
Eastern Boreal Shield	6.3	Central Montane Cordillera	14.2
Newfoundland	6.4	Southern Montane Cordillera	14.3
Lake of the Woods	6.5	Columbia Montane Cordillera	14.4
Southern Boreal Shield	6.6	Hudson Bay Coastal Plains	15.1
Appalachian–Acadian Highlands	7.1	Hudson–James Lowlands	15.2
Northumberland Lowlands	7.2		

Table 1.2
Geography

Drainage region	Code	Marine ecoregion	Code
Pacific Coastal	1	Strait of Georgia	1
Fraser–Lower Mainland	2	Southern Shelf	2
Okanagan–Similkameen	3	Offshore Pacific	3
Columbia	4	Northern Shelf	4
Yukon	5	Arctic Basin	5
Peace–Athabasca	6	Western Arctic	6
Lower Mackenzie	7	Arctic Archipelago	7
Arctic Coast–Islands	8	Eastern Arctic	8
Missouri	9	Hudson Bay Complex	9
North Saskatchewan	10	Newfoundland-Labrador Shelves	10
South Saskatchewan	11	Scotian Shelf	11
Assiniboine–Red	12	Gulf of St. Lawrence	12
Winnipeg	13		
Lower Saskatchewan–Nelson	14		
Churchill	15		
Keewatin–Southern Baffin Island	16		
Northern Ontario	17		
Northern Quebec	18		
Great Lakes	19		
Ottawa	20		
St. Lawrence	21		
North Shore–Gaspé	22		
Saint John–St. Croix	23		
Maritime Coastal	24		
Newfoundland–Labrador	25		

Land extent and landscape condition maps

Terrestrial and freshwater ecosystem extent



Code	Ecoprovince
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1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

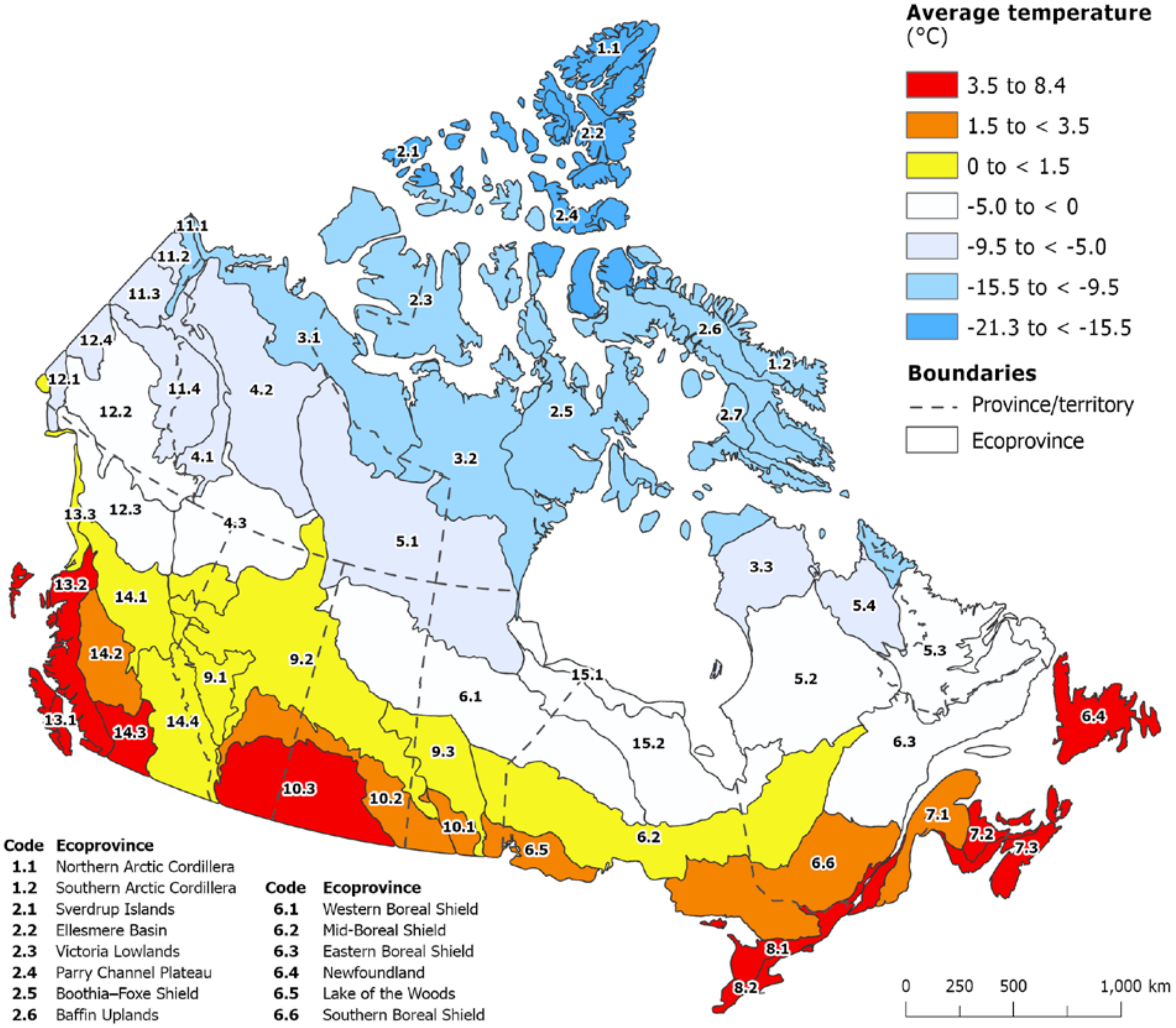
Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Ecosystem data here represent the latest comprehensive and comparable estimates for the country for the time period the data were developed. Data for built-up areas are from 2010. Peatlands are shown on the map where more than 50% of the soil landscape polygon is classified as peatland.
Sources: Beaudoin, A., et al., 2017, *Species composition, forest properties and land cover types across Canada's forests at 250 m resolution for 2001 and 2011*, Natural Resources Canada (NRCan), Canadian Forest Service, Laurentian Forestry Centre; Agriculture and Agri-Food Canada (AAFC), 2020, *Annual Crop Inventory, 2014-2016;* NRCan, Canada Centre for Mapping and Earth Observation, 2020, *2010 and 2015 Land Cover of North America at 30 metres*, Ed. 2.0, Commission for Environmental Cooperation (CEC), North American Land Change Monitoring System; Baldwin, K., et al., 2018, *Vegetation Zones of Canada: a Biogeoclimatic Perspective* [Map], Scale 1:5,000,000, NRCan, CFS; Tarnocai, C., I.M. Kettles, B. Lacelle, 2011, Peatlands of Canada, Geological Survey of Canada; AAFC, 2015, *Land Use, 1990, 2000 & 2010.*

Average annual temperature, by ecoprovince, 1979 to 2016



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2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

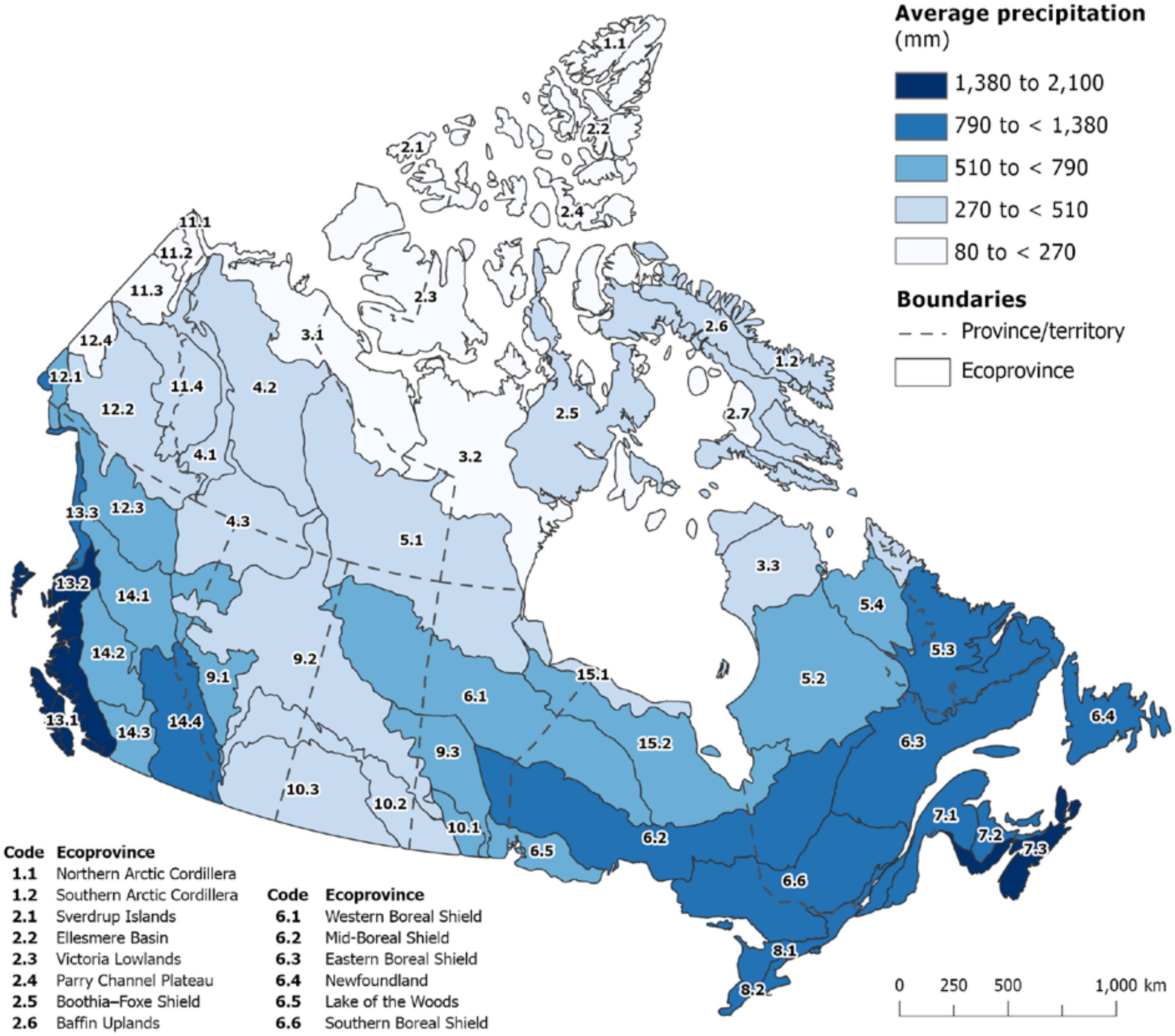
Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Sources: Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres,* Vol. 119, pp. 8712–8725.

Average annual precipitation, by ecoprovince, 1979 to 2016



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4.2	Great Bear Lowlands
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5.4	Whale River Lowland

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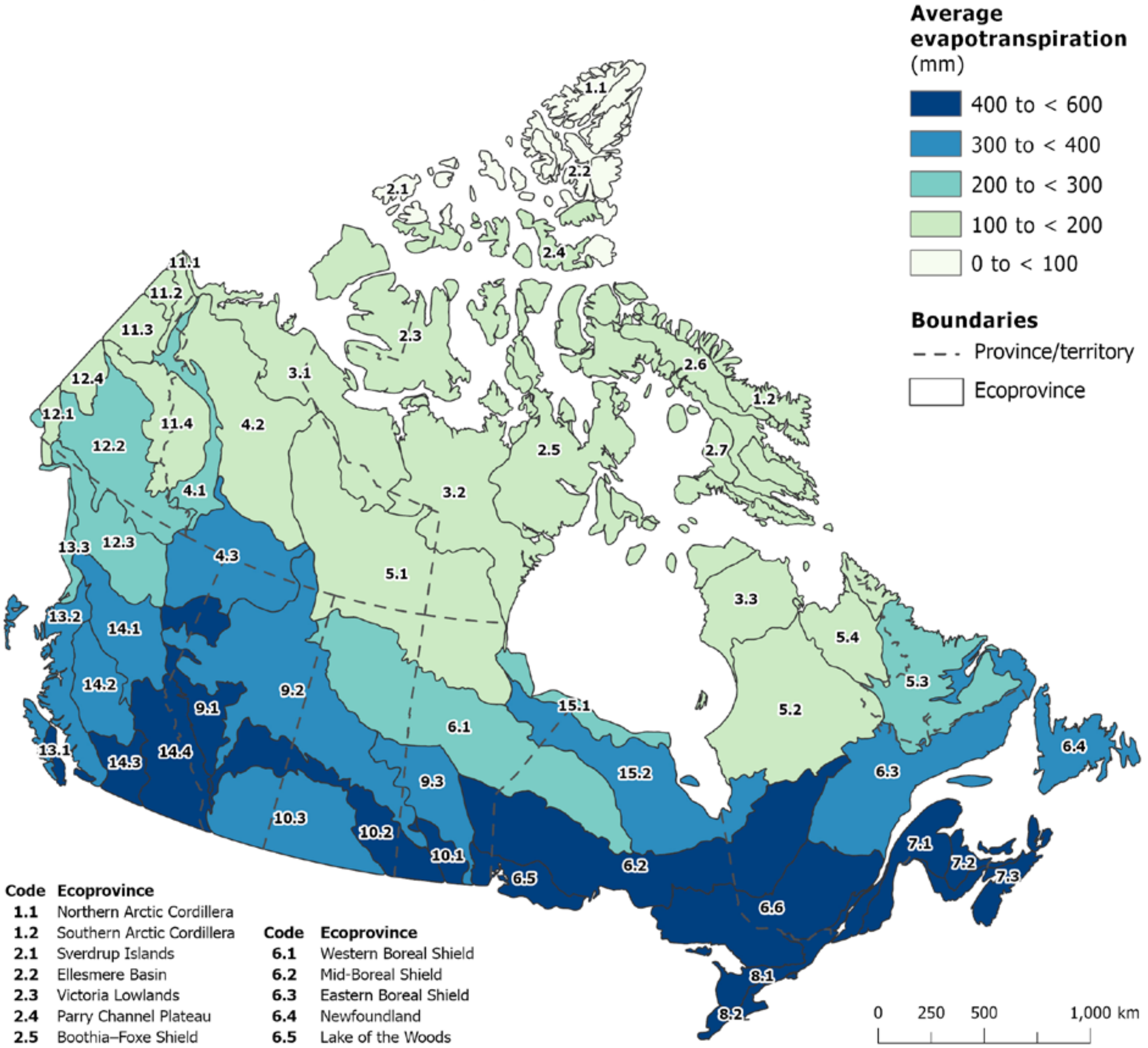
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Note: To convert precipitation measured in depth in mm to a volume per area in m^3/m^2, divide by 1000.
Sources: Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres,* Vol. 119, pp. 8712–8725.

Average annual evapotranspiration, by ecoprovince, 1979 to 2016



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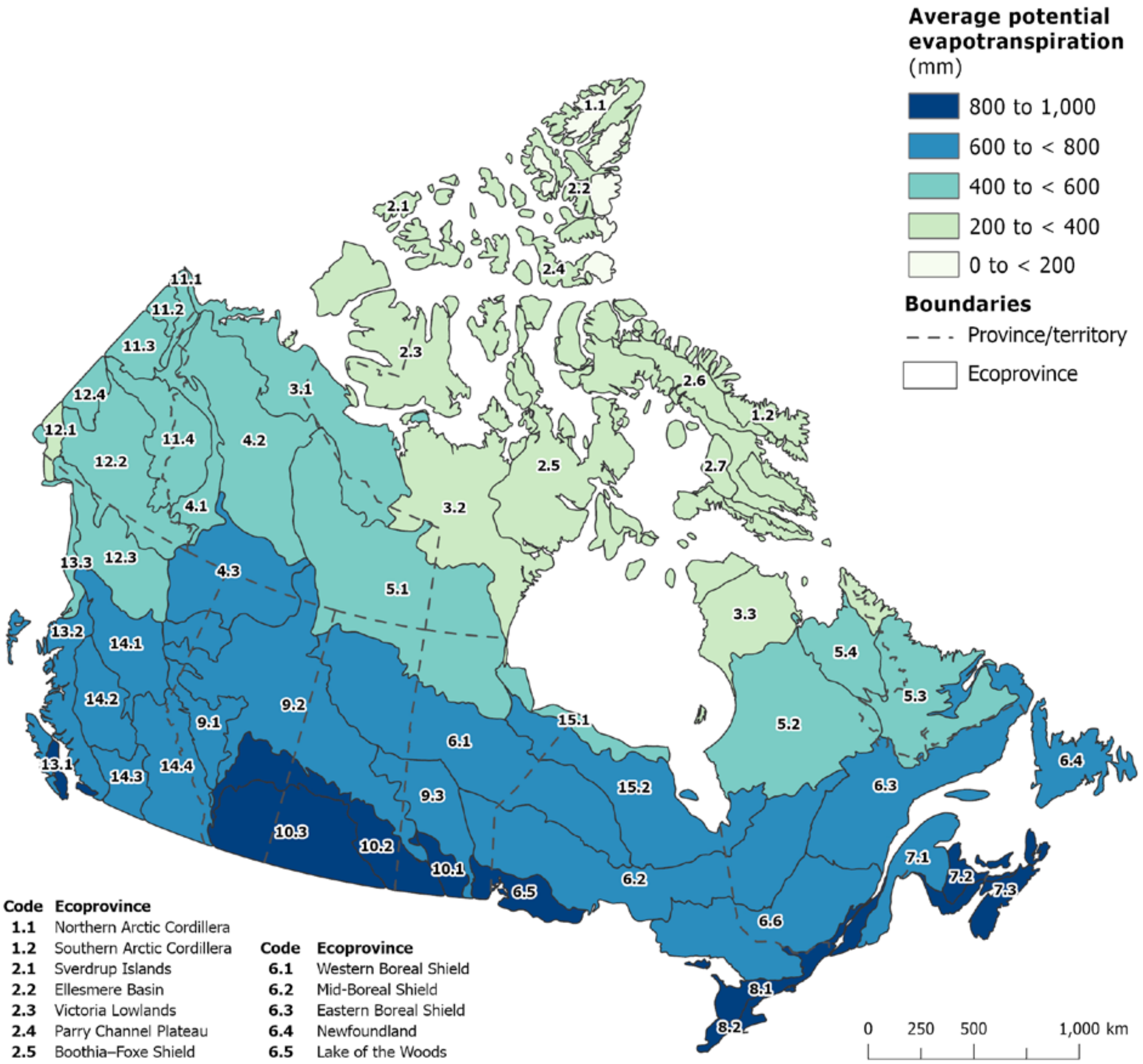
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Note: Evapotranspiration is the process of evaporation from land surfaces and transpiration from plants. It is controlled by surface water availability and by meteorological variables such as net solar radiation, air temperature and humidity and wind speed.
Sources: Wang, S., et al., 2014, "Assessment of water budget for sixteen large drainage basins in Canada," *Journal of Hydrology,* Vol. 512, pp. 1-15; Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575.

Average annual potential evapotranspiration, by ecoprovince, 1979 to 2016



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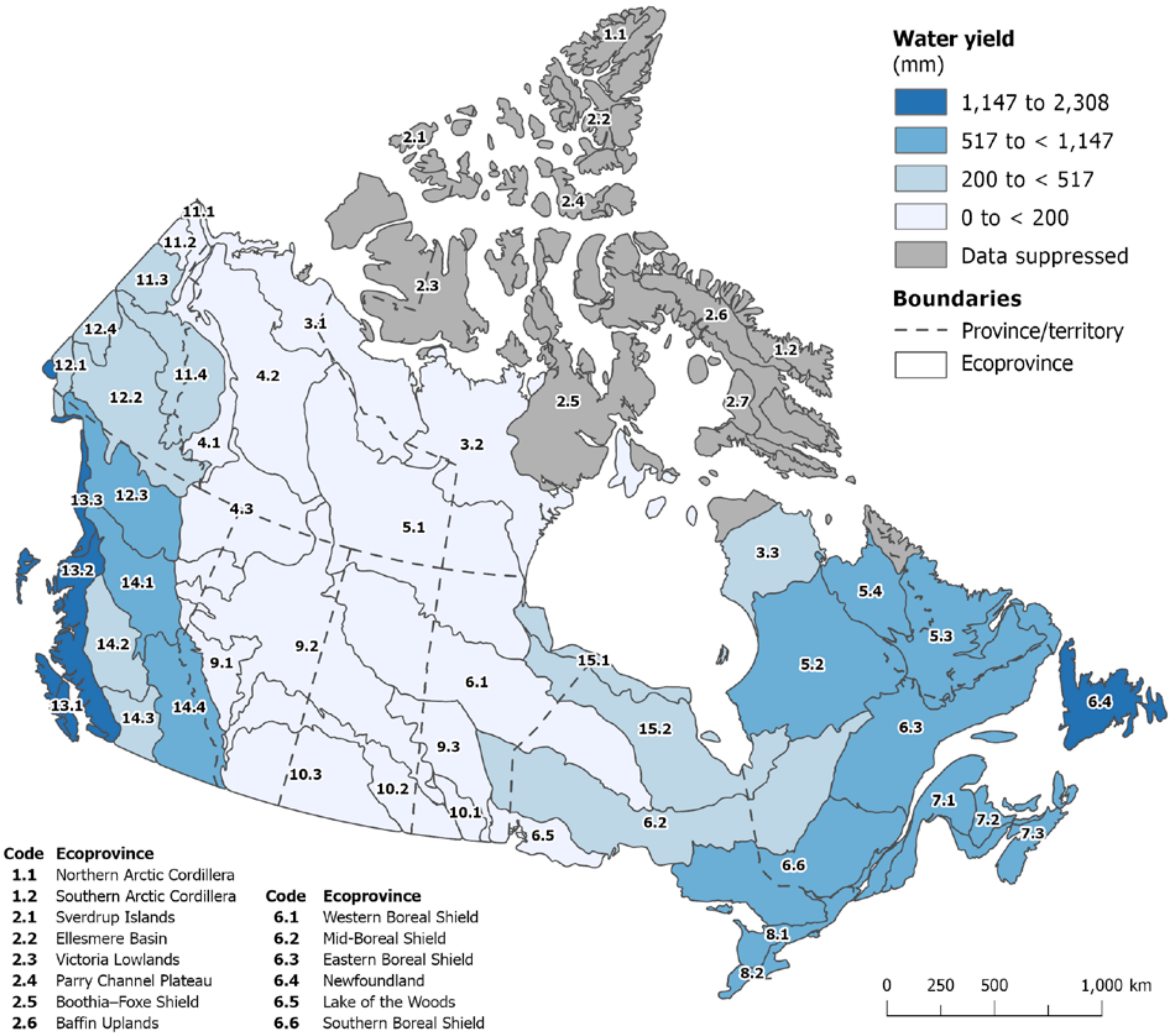
15.2	Hudson–James Lowlands

Note: Potential evapotranspiration represents the evapotranspiration that would occur without limitations on water supply, and is therefore linked to the amount of energy available to generate evapotranspiration in a specific area and is independent of water supply.

Sources: Li, Z., S. Wang and J. Li, 2020, "Spatial variations and long-term trends of potential evapotranspiration in Canada," *Scientific Reports*, Vol. 10, no. 22089; Wang, S., et al., 2014, "Assessment of water budget for sixteen large drainage basins in Canada," *Journal of Hydrology*, Vol. 512, pp. 1-15.

Average annual water yield per area, by ecoprovince, 1971 to 2014



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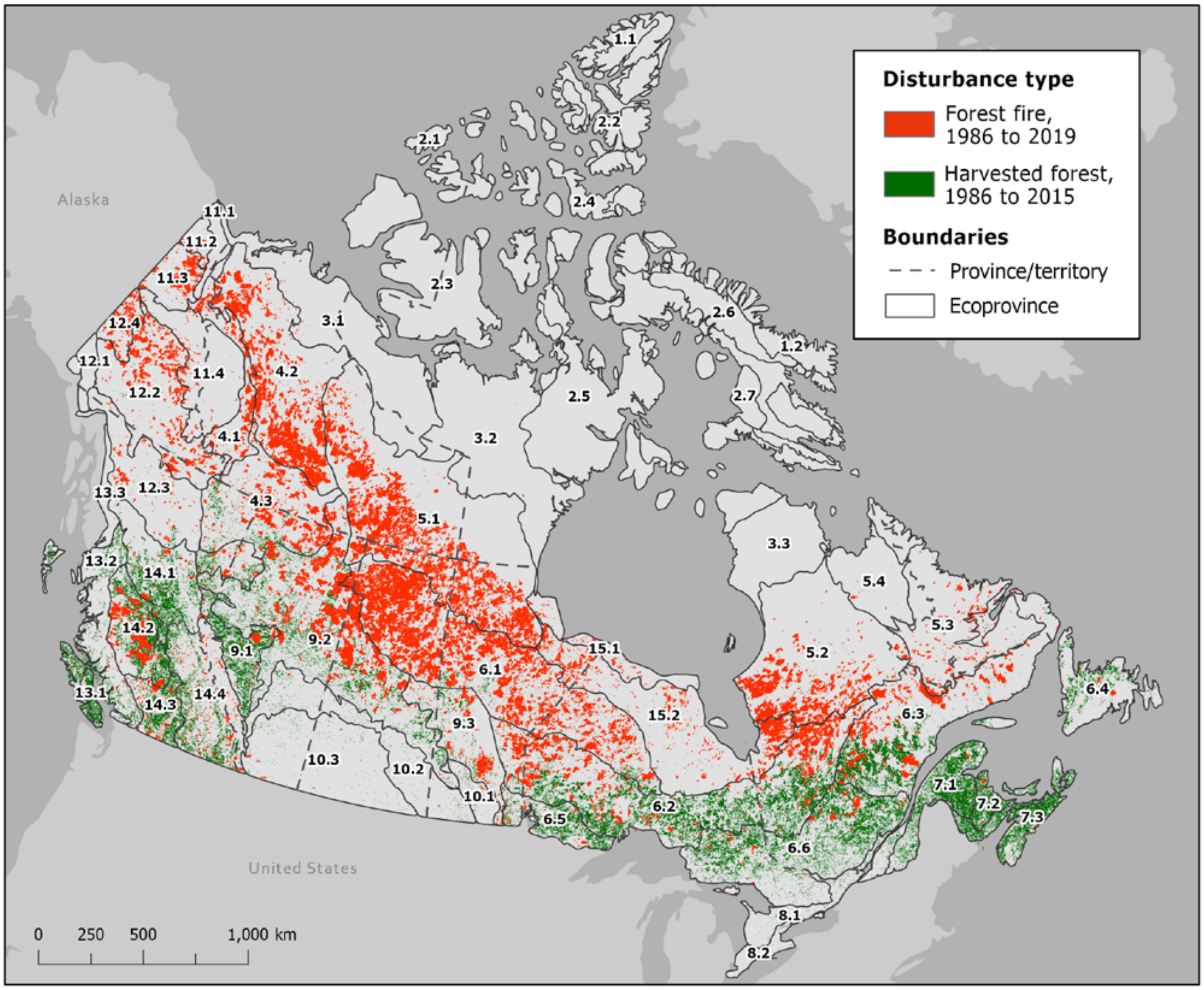
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Water yield is an estimate of freshwater runoff. Data were suppressed at the ecoprovince level for the North.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, *Table 38-10-0091-01;* Spence, C. and A. Burke, 2008, "Estimates of Canadian Arctic Archipelago runoff from observed hydrometric data," *Journal of Hydrology,* Vol. 362, pp. 247-259.

Forest fire and harvesting

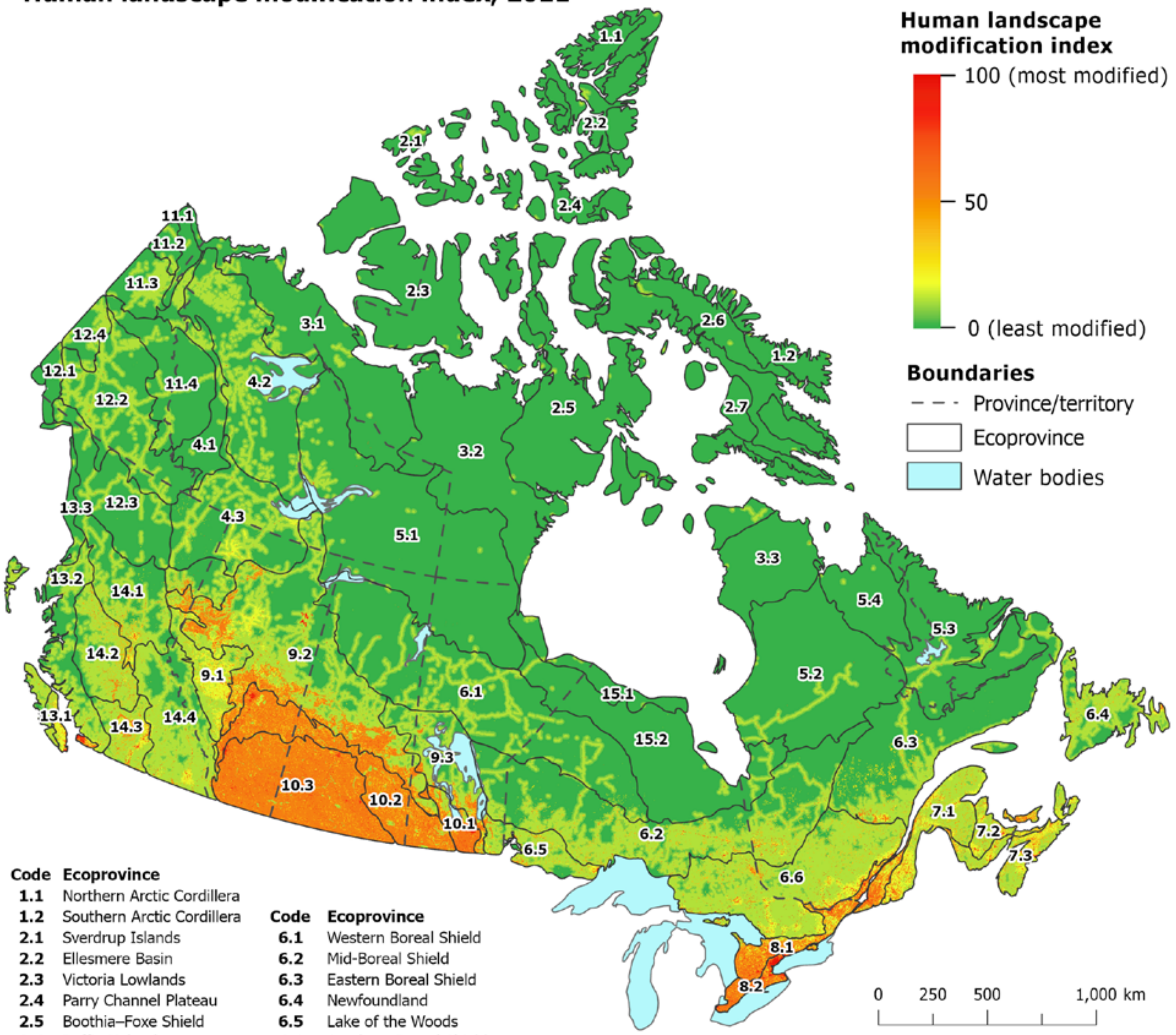


Code	Ecoprovince	Code	Ecoprovince	Code	Ecoprovince	Code	Ecoprovince
1.1	Northern Arctic Cordillera	**4.3**	Hay–Slave Lowlands	**8.1**	Great Lakes–St. Lawrence	**12.4**	Western Boreal Cordillera
1.2	Southern Arctic Cordillera	**5.1**	Western Taiga Shield	**8.2**	Huron–Erie Plains	**13.1**	Georgia Depression
2.1	Sverdrup Islands	**5.2**	Eastern Taiga	**9.1**	Boreal Foothills	**13.2**	Southern Coastal Mountains
2.2	Ellesmere Basin	**5.3**	Labrador Uplands	**9.2**	Central Boreal Plains	**13.3**	Northern Coastal Mountains
2.3	Victoria Lowlands	**5.4**	Whale River Lowland	**9.3**	Eastern Boreal Plains	**11.1**	Northern Yukon Mountains
2.4	Parry Channel Plateau	**6.1**	Western Boreal Shield	**10.1**	Eastern Prairies	**14.1**	Northern Montane Cordillera
2.5	Boothia–Foxe Shield	**6.2**	Mid-Boreal Shield	**10.2**	Parkland Prairies	**14.2**	Central Montane Cordillera
2.6	Baffin Uplands	**6.3**	Eastern Boreal Shield	**10.3**	Central Grassland	**14.3**	Southern Montane Cordillera
2.7	Foxe–Boothia Lowlands	**6.4**	Newfoundland	**11.2**	Old Crow–Eagle Plains	**14.4**	Columbia Montane Cordillera
3.1	Amundsen Lowlands	**6.5**	Lake of the Woods	**11.3**	Ogilvie Mountains	**15.1**	Hudson Bay Coastal Plains
3.2	Keewatin Lowlands	**6.6**	Southern Boreal Shield	**11.4**	Mackenzie–Selwyn Mountains	**15.2**	Hudson–James Lowlands
3.3	Ungava–Belcher	**7.1**	Appalachian–Acadian Highlands	**12.1**	Wrangel Mountains		
4.1	Mackenzie Foothills	**7.2**	Northumberland Lowlands	**12.2**	Northern Boreal Cordillera		
4.2	Great Bear Lowlands	**7.3**	Fundy Uplands	**12.3**	Southern Boreal Cordillera		

Notes: Harvest data are identified by 30 m Landsat remote sensing. Fire data are taken from the *National Burned Area Composite,* part of the Fire Monitoring, Accounting and Reporting System, based on the integration of data from fine and coarse resolution satellite data from Natural Resources Canada and Provincial, Territorial and Parks Canada Agencies. These data differ from the harvesting and burned area totals reported in the National Forestry Database, which are based on different methodologies.

Sources: Natural Resources Canada, Canadian Forest Service, 2020, *National Burned Area Composite (NBAC);* Guindon, L., et al., 2017, *Canada Landsat Disturbance (CanLaD): a Canada-wide Landsat-based 30-m resolution product of fire and harvest detection and attribution since 1984.*

Human landscape modification index, 2011



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

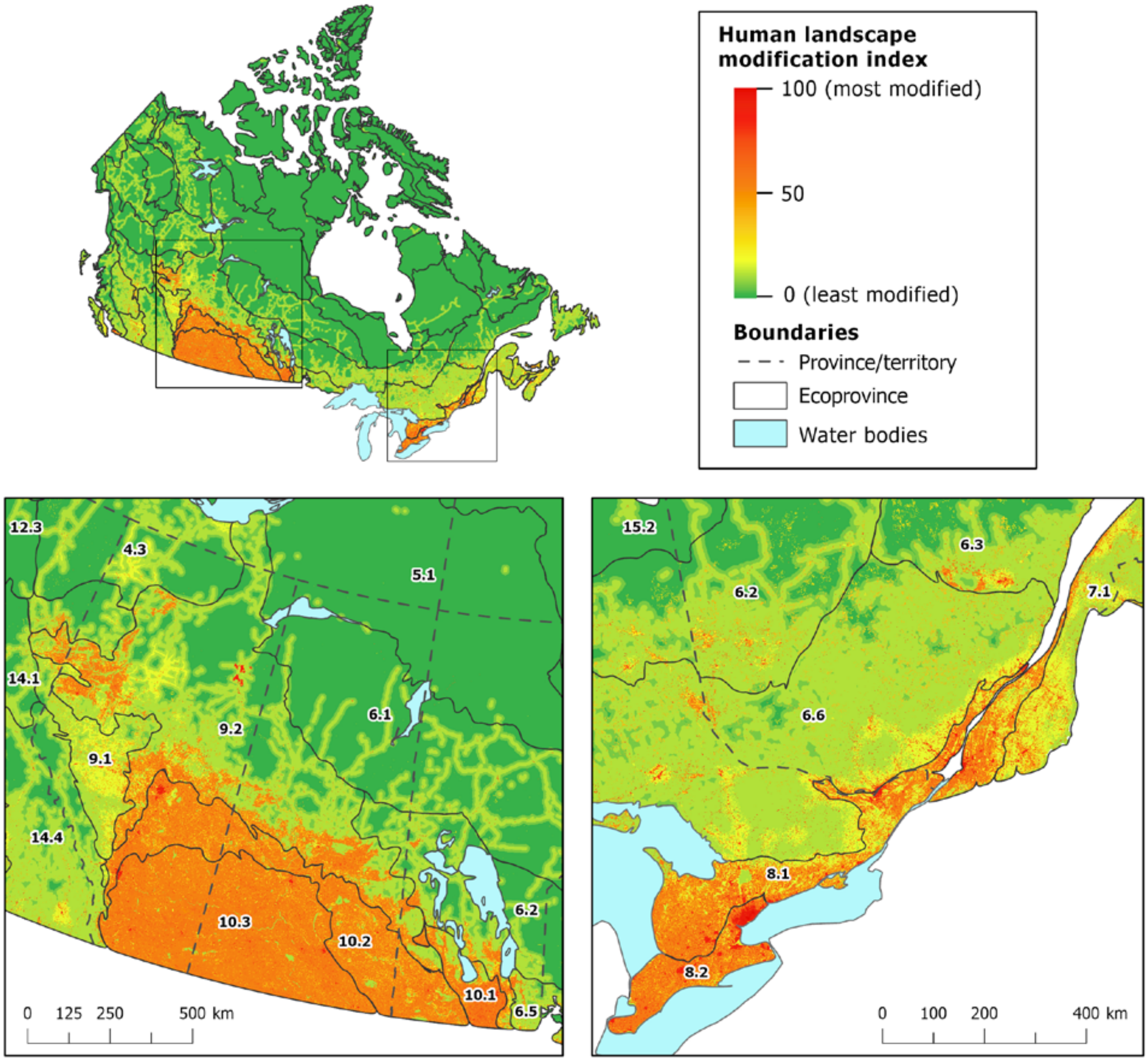
Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: The human landscape modification index (HLMI) is a composite index used to measure direct human modifications to the landscape based on the degree that an area has been modified from a natural or semi-natural state. Values range from 0 to 100, with higher scores indicating more intensively-used ecosystems.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Agriculture and Agri-Food Canada (AAFC), 2015, *Land Use, 2010;* Natural Resources Canada, 2017, Topographic Data of Canada - CanVec Series; Statistics Canada, 2017, *Road Network File, 2016;* AAFC, 2016, *Interpolated Census of Agriculture;* Guindon, L., et al., 2017, *Canada Landsat Disturbance (CanLaD): a Canada-wide Landsat-based 30-m resolution product of fire and harvest detection and attribution since 1984.*

Human landscape modification index, highly modified regions, 2011

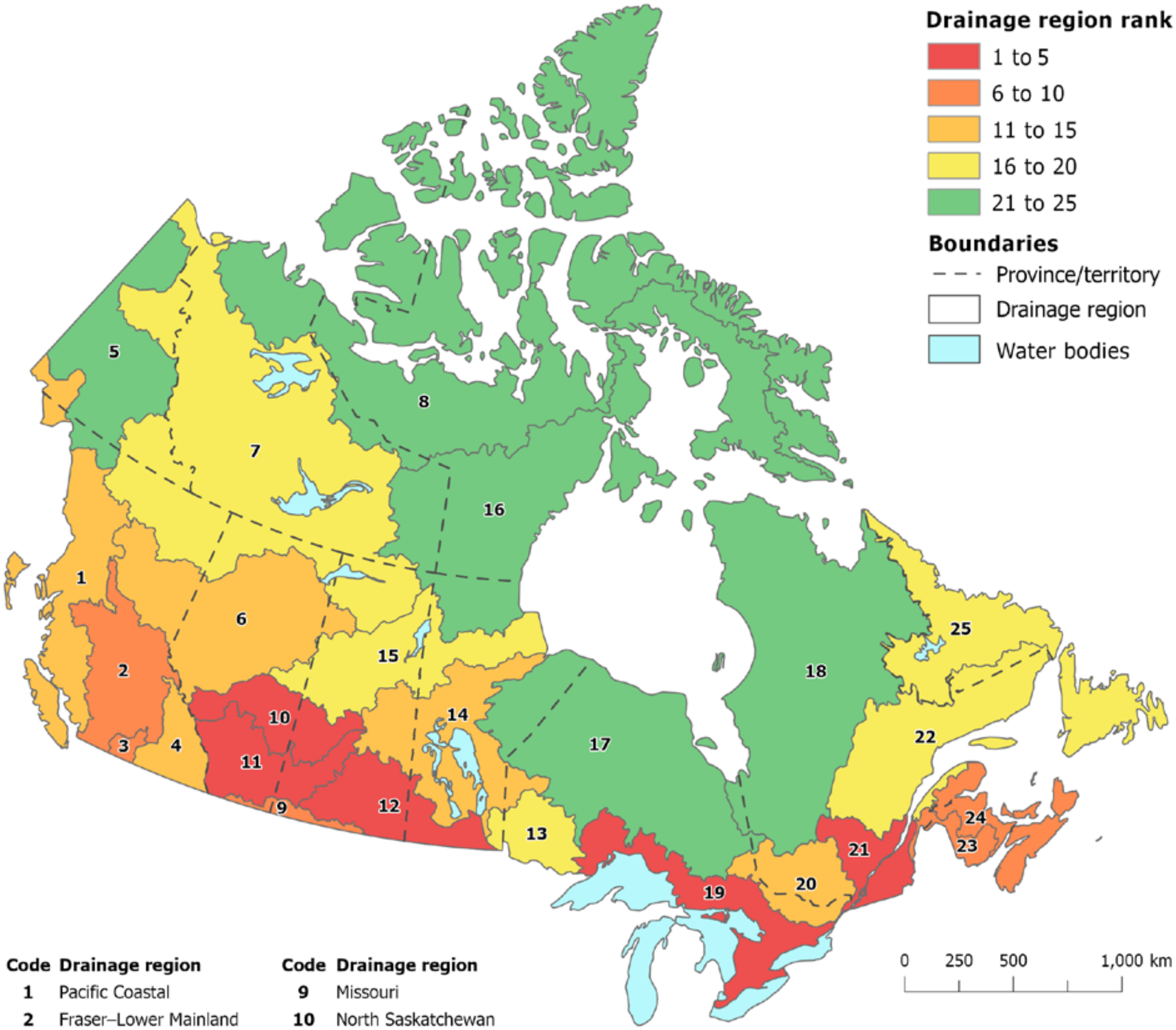


Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: The human landscape modification index (HLMI) is a composite index used to measure direct human modifications to the landscape based on the degree that an area has been modified from a natural or semi-natural state. Values range from 0 to 100, with higher scores indicating more intensively-used ecosystems.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Agriculture and Agri-Food Canada (AAFC), 2015, *Land Use, 2010;* Natural Resources Canada, 2017, Topographic Data of Canada - CanVec Series; Statistics Canada, 2017, *Road Network File, 2016;* AAFC, 2016, *Interpolated Census of Agriculture;* Guindon, L., et al., 2017, *Canada Landsat Disturbance (CanLaD): a Canada-wide Landsat-based 30-m resolution product of fire and harvest detection and attribution since 1984.*

Human freshwater influences index, by drainage region

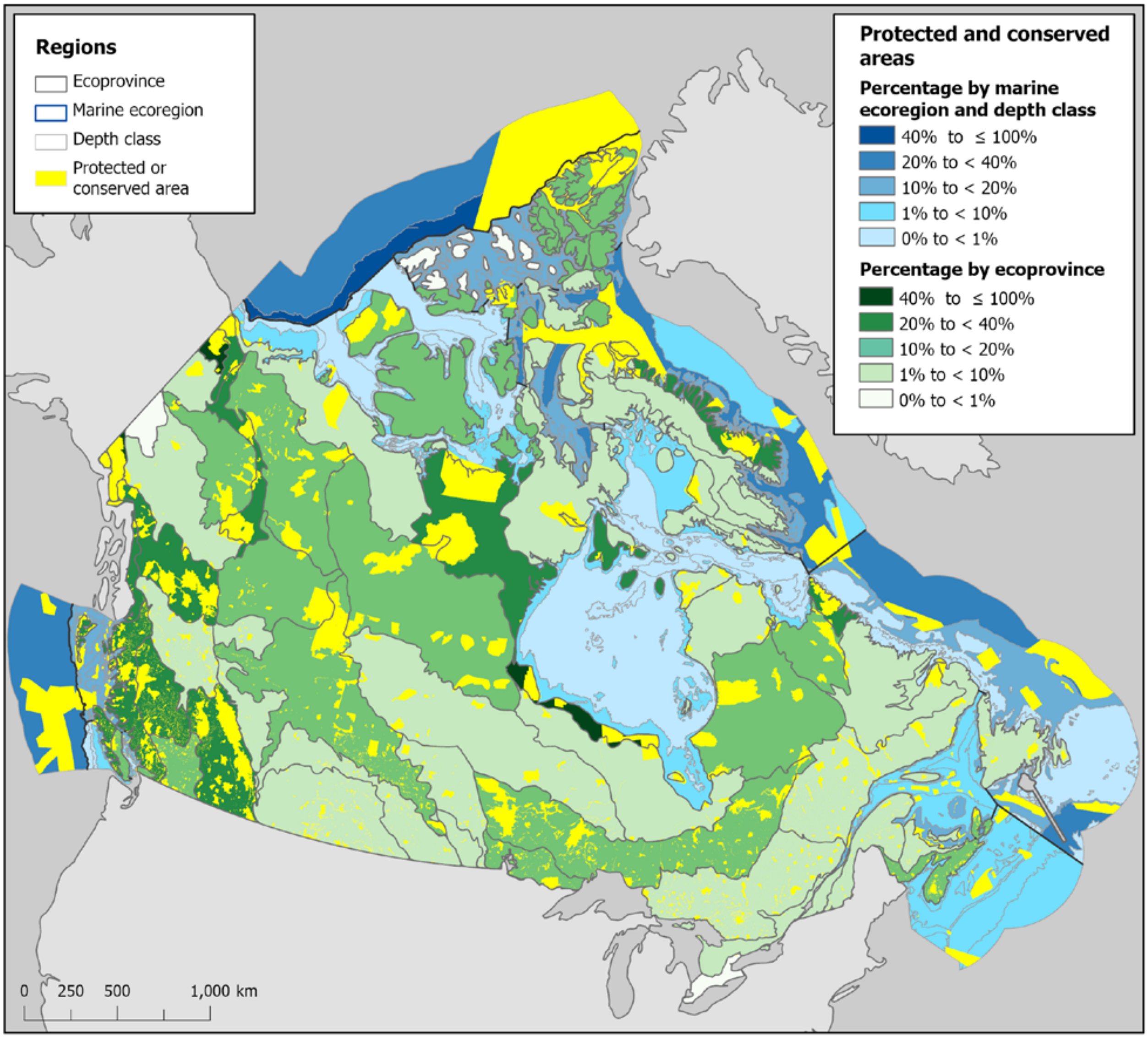


Code	Drainage region
1	Pacific Coastal
2	Fraser–Lower Mainland
3	Okanagan–Similkameen
4	Columbia
5	Yukon
6	Peace–Athabasca
7	Lower Mackenzie
8	Arctic Coast–Islands
9	Missouri
10	North Saskatchewan
11	South Saskatchewan
12	Assiniboine–Red
13	Winnipeg
14	Lower Saskatchewan–Nelson
15	Churchill
16	Keewatin–Southern Baffin Island
17	Northern Ontario
18	Northern Quebec
19	Great Lakes
20	Ottawa
21	St. Lawrence
22	North Shore–Gaspé
23	Saint John–St. Croix
24	Maritime Coastal
25	Newfoundland–Labrador

Notes: The human freshwater influences index is an overall ranking of drainage regions based on individual rankings of selected anthropogenic variables that affect freshwater ecosystems. The overall rank is determined by ranking each variable individually from highest to lowest impact and then calculating the average of the rankings. Lower values indicate a higher degree of human influence.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD);* Statistics Canada, 2011, *Census of Population;* Agriculture and Agri-Food Canada (AAFC), 2015, *Land Use, 2010;* Natural Resources Canada (NRCan), 2017, *Topographic Data of Canada - CanVec Series;* Statistics Canada, 2017, *Road Network File, 2016;* Statistics Canada, 2013, *Table 16-403-X, Survey of Drinking Water Plants, 2011;* Statistics Canada, 2014, *Table 16-401-X Industrial Water Use, 2011;* AAFC, 2015, *Agri-environmental Indicator—Residual Soil Nitrogen (RSN);* AAFC, 2015, *Agri-environmental Indicator—Risk of P release in agricultural land (P-Source);* ECCC, 2015, *National Pollutant Release Inventory, Pollution Data and Reports;* Statistics Canada, 2020, *Table 38-10-0099-01 Wastewater volumes processed by municipal sewage systems (x 1,000,000);* NRCan, 2017, *CanVec Series;* Canadian Dam Association, 2019, *Inventory of Large Dams in Canada 2019.*

Protected and conserved area extent, by ecoprovince and marine ecoregion depth class, 2020

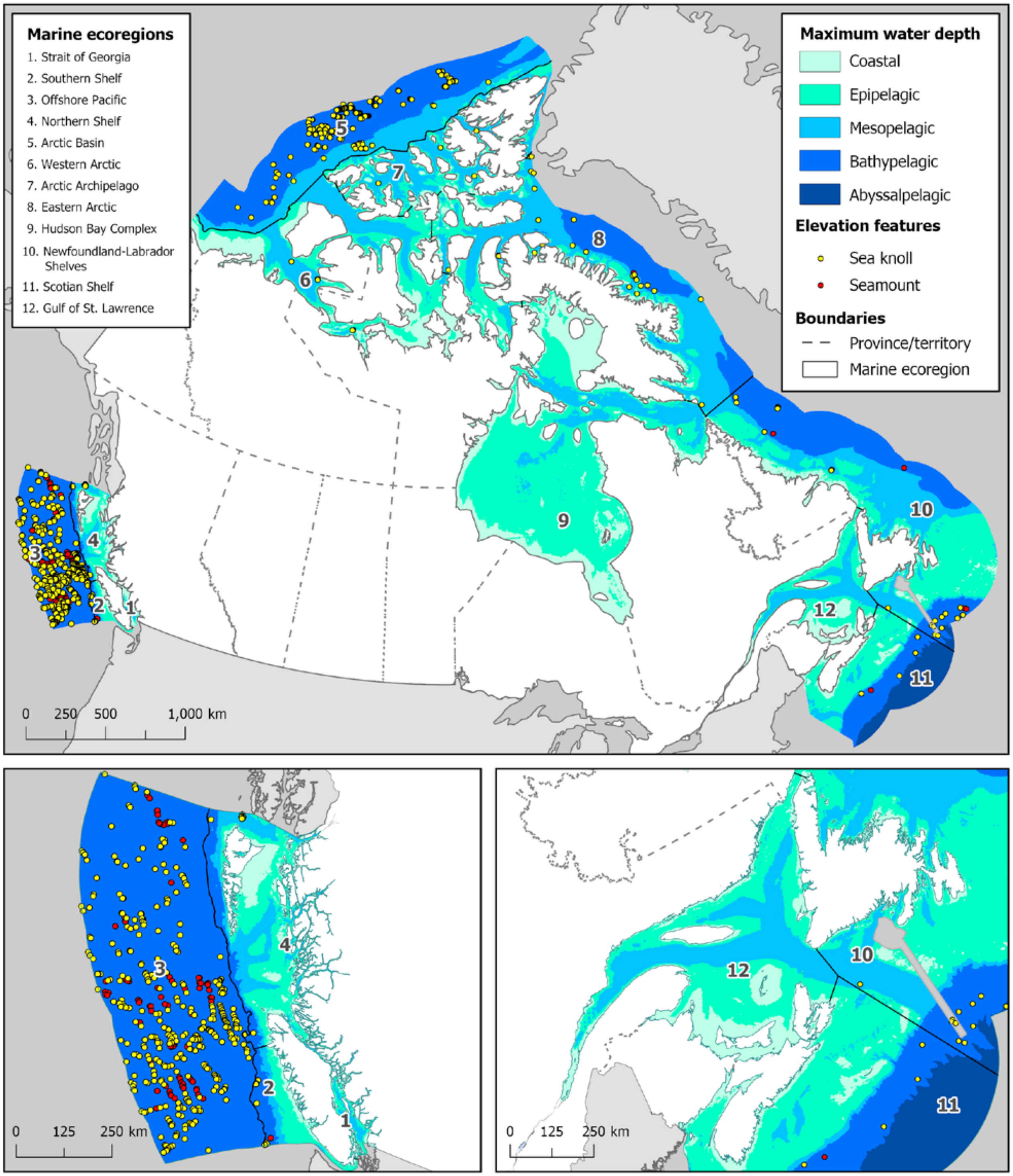


Note: Protected and conserved areas have been divided into terrestrial and marine parts. Any overlap between protected and conserved areas has been removed to avoid double counting.

Source: Environment and Climate Change Canada, 2020, Canadian Protected and Conserved Areas Database, December 2020.

Marine and coastal maps

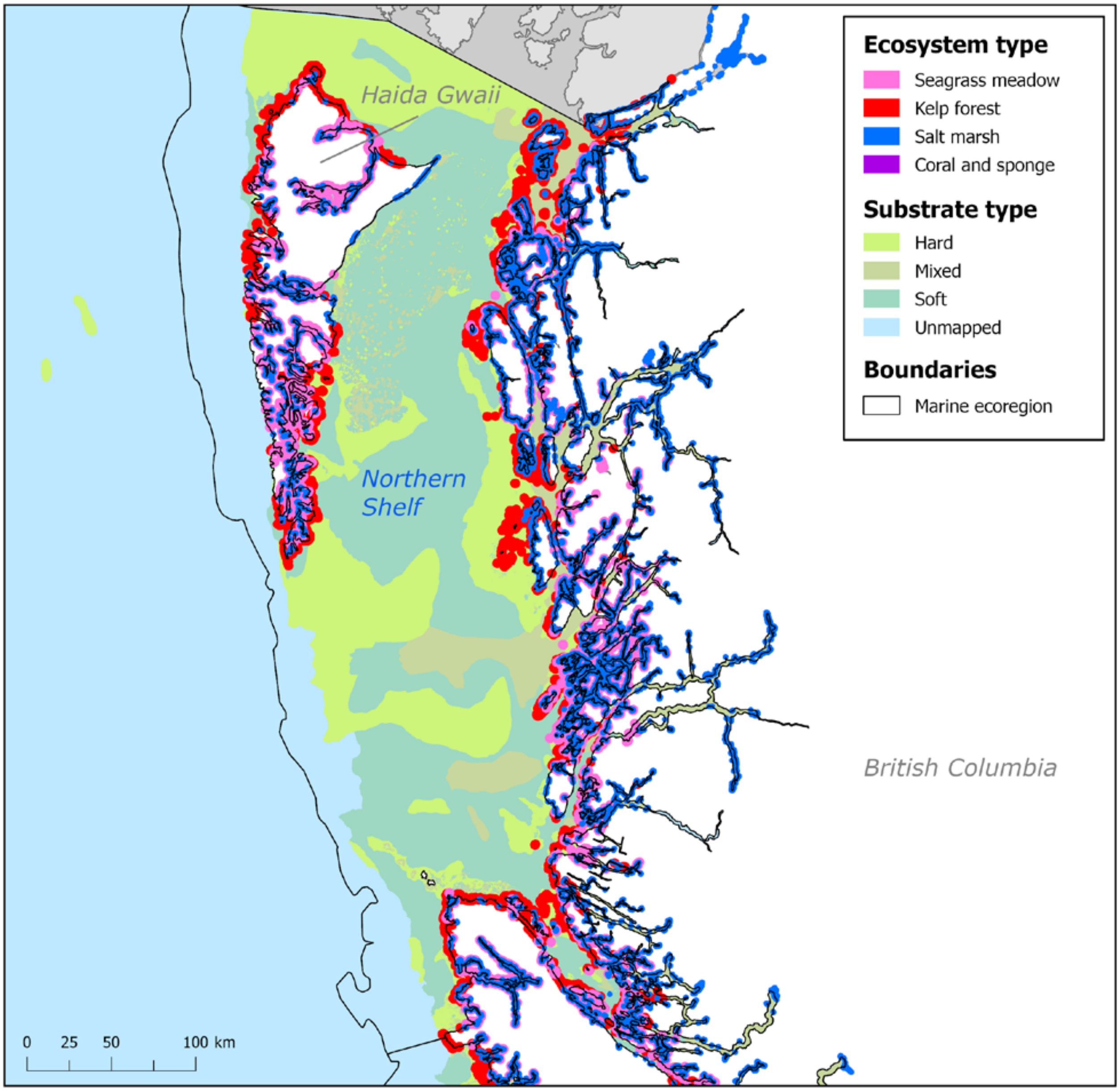
Marine and coastal extent, by depth class, elevation features and marine ecoregion



Notes: This map classifies areas of Canada's exclusive economic zone (EEZ) by their maximum water depth. Areas classed as coastal have a maximum depth of 50 m, the epipelagic class has depths from 50 m to 200 m, the mesopelagic class has depths from 200 m to 1,000 m, the bathypelagic class has depths of 1 km to 4 km and the abyssalpelagic class includes all areas with depths of more than 4 km.

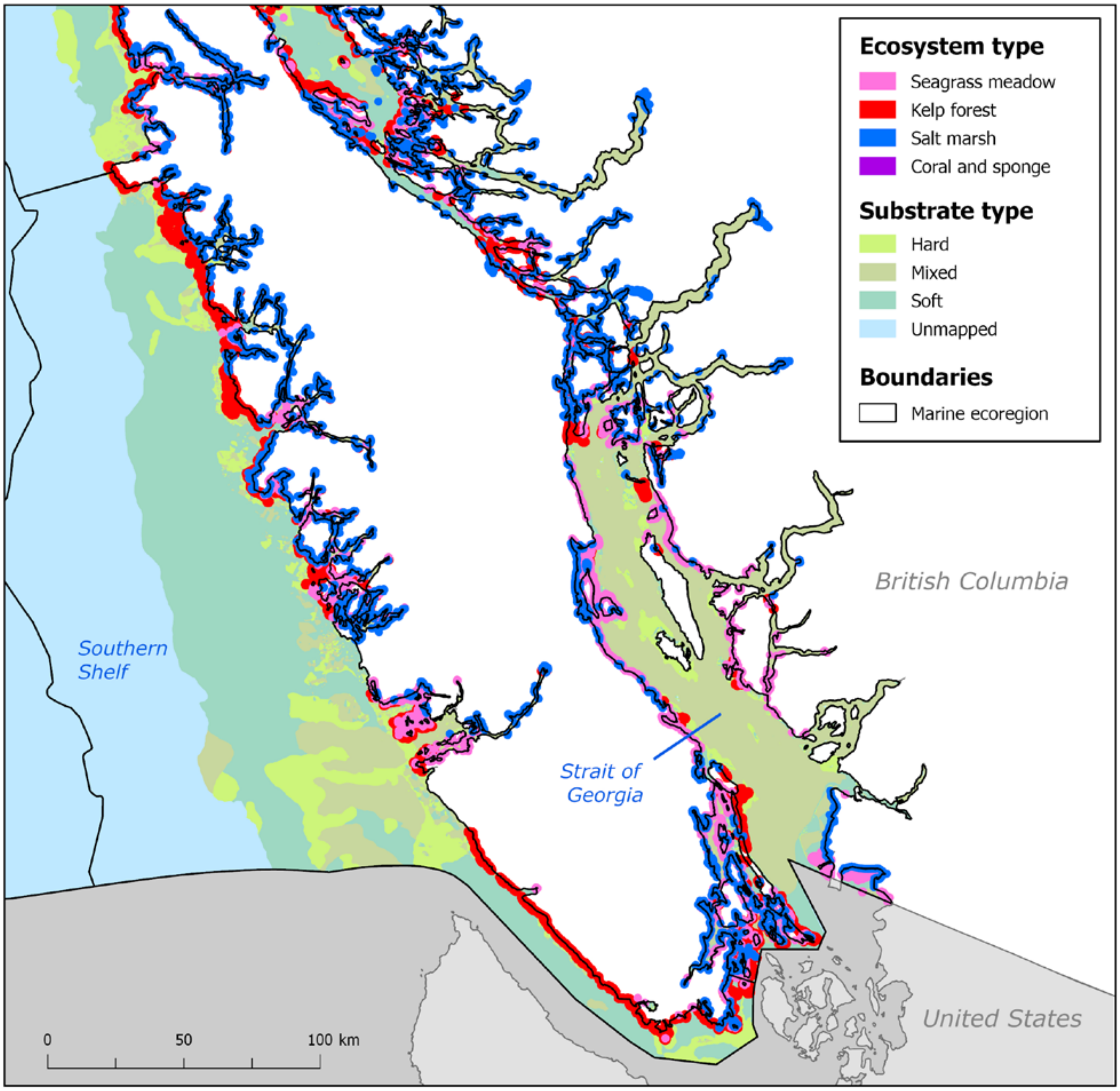
Sources: GEBCO Compilation Group, 2015, *GEBCO 2014 Grid*, version 20150318; Yesson, C., et al., 2011 "The global distribution of seamounts based on 30-second bathymetry data," *Deep Sea Research Part1: Oceanographic Research Papers*, Vol 58, pp. 442-453.

Marine and coastal extent: ecosystems and substrate, northern British Columbia coast



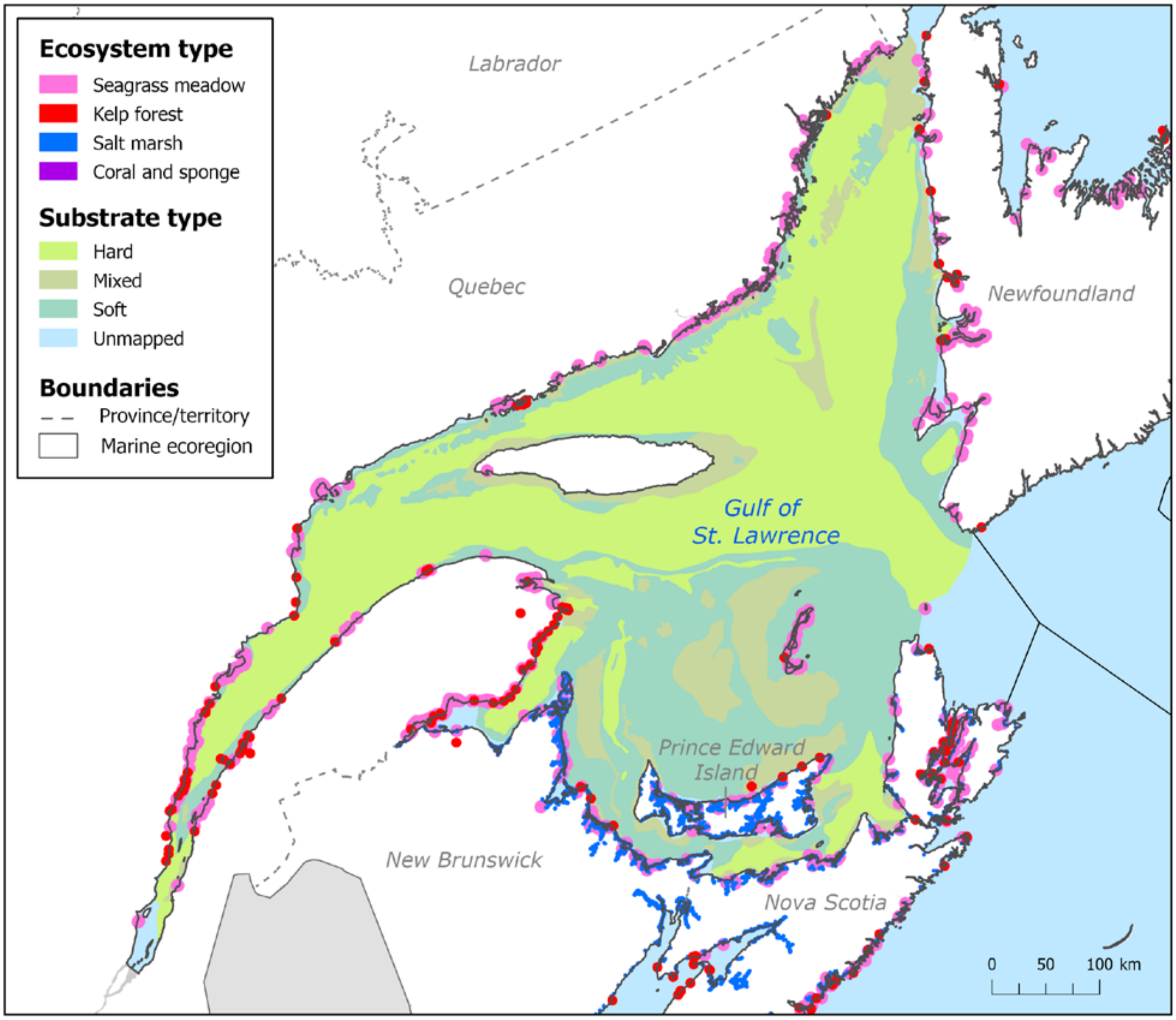
Sources: McOwen, C., et. al., 2017, "A global map of saltmarshes," *Biodiversity Data Journal,* Vol. 5: e11764; B.C. Ministry of Forests, Lands, Natural Resources Operations and Rural Development, 2019, *Kelp Beds - Coastal Resource Information Management System (CRIMS), GeoBC;* Freiwald, A., et. al., 2017, "Global distribution of cold-water corals (version 5.0)," Fifth update to the dataset in Freiwald, et. al., 2004, by UNEP-WCMC, in collaboration with A. Freiwald and J. Guinotte, Cambridge (UK): UN Environment World Conservation Monitoring Centre; Fisheries and Oceans Canada, 2016, *Oceans Act Marine Protected Areas*; Fisheries and Oceans Canada, 2017, *Other Effective Area-Based Conservation Measures;* B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2019, *Eelgrasses - Coastal Resource Information Management System (CRIMS), GeoBC*; Personal communication with Brett Painter, Environment and Climate Change Canada, June 21, 2019; Personal communication with Heike Lotz, Dalhousie University, June 21, 2019; Personal communication with John Cristiani and Mary O'Connor, University of British Columbia, June 14, 2019; UNEP-WCMC and F.T. Short, 2018, *Global Distribution of Seagrasses (version 6.0),* Sixth update to the data layer used in Green and Short, 2003, Cambridge, (UK): UN Environment World Conservation Monitoring Centre; Gregr, E. J., J. Lessard and J. Harper, 2013, "Pacific data from a spatial framework for representing nearshore ecosystems," *Progress in Oceanography*, Vol. 1153, p. 189-201; Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 1979, *Benthic Marine Ecounits - Coastal Resource Information Management System (CRIMS), GeoBC.*

Marine and coastal extent: ecosystems and substrate, southern British Columbia coast



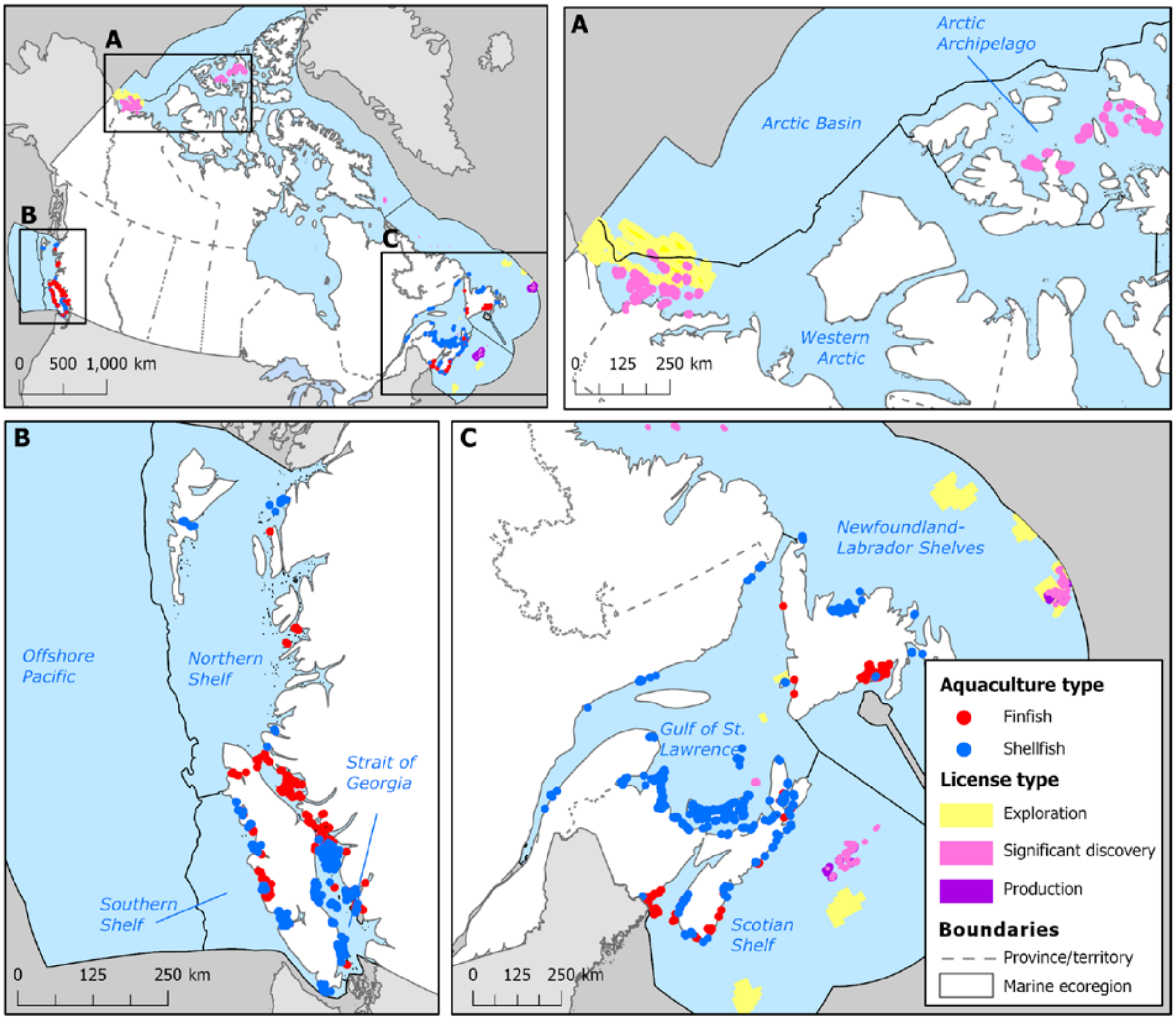
Sources: McOwen, C., et. al., 2017, "A global map of saltmarshes," *Biodiversity Data Journal,* Vol. 5: e11764; B.C. Ministry of Forests, Lands, Natural Resources Operations and Rural Development, 2019, *Kelp Beds - Coastal Resource Information Management System (CRIMS), GeoBC;* Freiwald, A., et. al., 2017, "Global distribution of cold-water corals (version 5.0)," Fifth update to the dataset in Freiwald, et. al., 2004, by UNEP-WCMC, in collaboration with A. Freiwald and J. Guinotte, Cambridge (UK): UN Environment World Conservation Monitoring Centre; Fisheries and Oceans Canada, 2016, *Oceans Act Marine Protected Areas;* Fisheries and Oceans Canada, 2017, *Other Effective Area-Based Conservation Measures*; B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2019, *Eelgrasses - Coastal Resource Information Management System (CRIMS), GeoBC*; Personal communication with Brett Painter, Environment and Climate Change Canada, June 21, 2019; Personal communication with Heike Lotz, Dalhousie University, June 21, 2019; Personal communication with John Cristiani and Mary O'Connor, University of British Columbia, June 14, 2019; UNEP-WCMC and F.T. Short, 2018, *Global Distribution of Seagrasses (version 6.0),* Sixth update to the data layer used in Green and Short, 2003, Cambridge, (UK): UN Environment World Conservation Monitoring Centre; Gregr, E. J., J. Lessard and J. Harper, 2013, "Pacific data from a spatial framework for representing nearshore ecosystems," *Progress in Oceanography*, Vol. 1153, p. 189-201; Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 1979, *Benthic Marine Ecounits - Coastal Resource Information Management System (CRIMS), GeoBC.*

Marine and coastal extent, ecosystems and substrate, Gulf of St. Lawrence



Sources: McOwen, C., et al., 2017, "A global map of saltmarshes," *Biodiversity Data Journal,* Vol. 5: e11764; Wilson K.L., M.A. Skinner and H.K. Lotze, 2019, "Projected 21st-century distribution of canopy-forming seaweeds in the Northwest Atlantic with climate change," *Diversity and Distributions,* Vol. 25, no. 4, pp. 582-602; Freiwald, A., et. al.,2017, "Global distribution of cold-water corals (version 5.0)," Fifth update to the dataset in Freiwald,et.al., 2004, by UNEP-WCMC, in collaboration with A. Freiwald and J. Guinotte, Cambridge (UK): UN Environment World Conservation Monitoring Centre; Kenchington, E., et. al., 2018, *Delineation of Coral and Sponge Significant Benthic areas in Eastern Canada Using Kernel Density Analyses and Species Distribution Models;* Fisheries and Oceans Canada, 2016, *Oceans Act Marine Protected Areas;* Fisheries and Oceans Canada, 2017, *Other Effective Area-Based Conservation Measures;* Fisheries and Oceans Canada, 2019, *Eelgrass inventory in James Bay, Chaleur Bay, Estuary and Gulf of St. Lawrence;* Personal communication with Brett Painter, Environment and Climate Change Canada, June 21, 2019; Personal communication with Heike Lotz, Dalhousie University, June 21, 2019; Personal communication with John Cristiani and Mary O'Connor, University of British Columbia, June 14, 2019; Personal communication with Amanda Bates and Jasmin Schuster, Memorial University (February 10, 2020), Personal communication with Arnault LeBris, Memorial University (May 20, 2020); UNEP-WCMC and F.T. Short, 2018, "Global Distribution of Seagrasses (version 6.0)," Sixth update to the data layer used in Green and Short, 2003, Cambridge (UK): UN Environment World Conservation Monitoring Centre; Loring, D. H. and D. J. G. Nota, 1973, "Morphology and sediments of the Gulf of St. Lawrence," *Bull. Fish. Res. Bd. Can.,* Vol. 182.

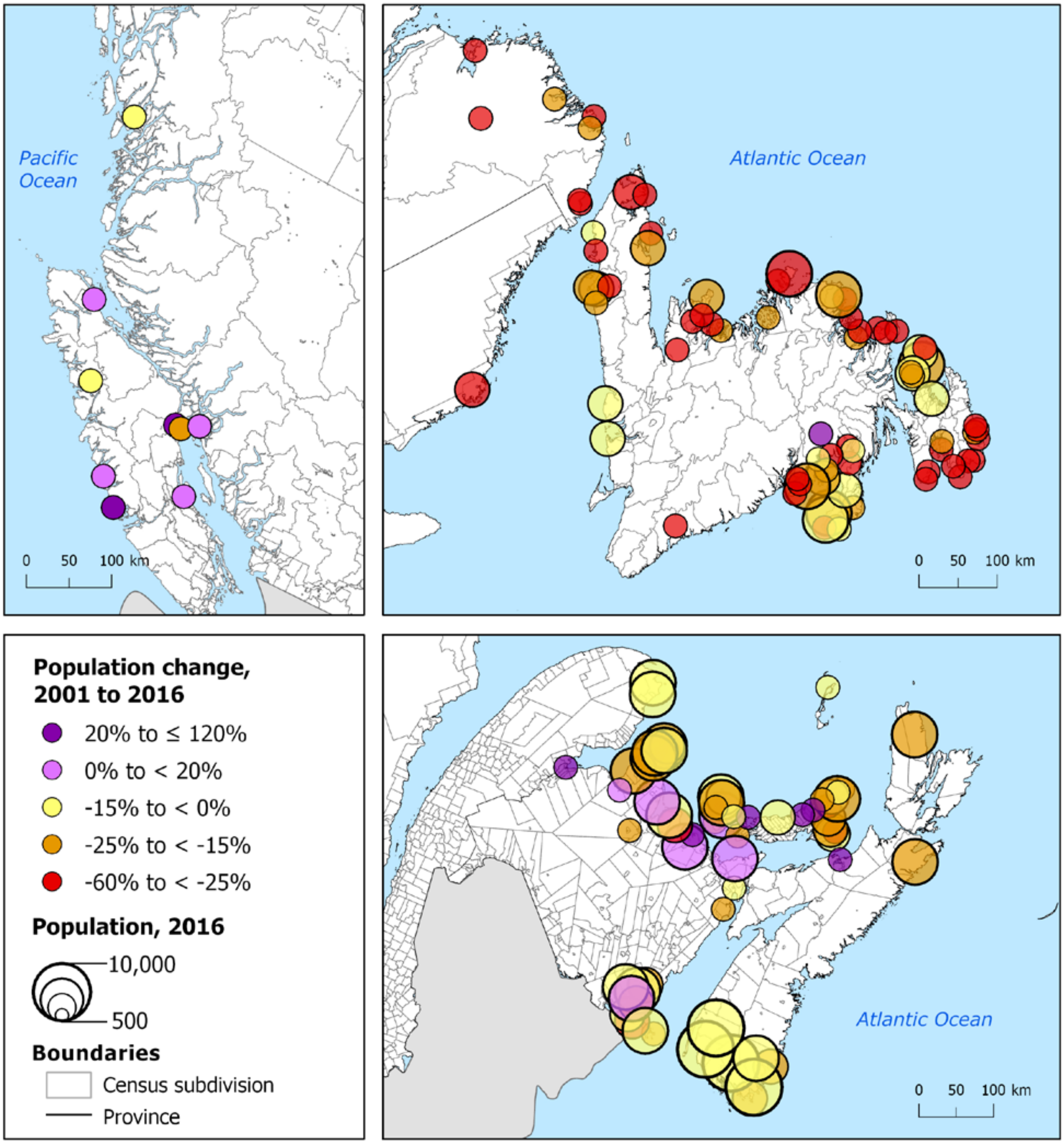
Marine and coastal modifications: aquaculture sites and oil licenses, circa 2016 to 2020



Note: There has been a moratorium on oil exploration on the Pacific Coast of Canada since 1972 and on the Arctic Coast since 2016. As of 2019, all oil and gas activity is prohibited in Canadian Arctic offshore waters.

Sources: Newfoundland Aquaculture Industry Association, 2016, *Industry by the Numbers*; Newfoundland and Labrador Aquaculture, Fisheries and Land Resources, n.d., *Licensed aquaculture sites, 2015*; Nova Scotia Fisheries and Aquaculture, 2020, *Nova Scotia Marine Aquaculture Leases*; Mills, D., 2014, *PEI Aquaculture Licenses*; Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, 2019, *Portrait-diagnostic sectoriel de l'industrie de la mariculture au Québec*; New Brunswick Department of Agriculture, Aquaculture and Fisheries, 2019, *Marine Aquaculture Site Mapping Program (MASMP)*; British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2011, *Saltwater Finfish Tenures – Coastal Resource Information Management System (CRIMS), GeoBC*; Fisheries and Oceans Canada, 2017, *Shellfish Integrated Management of Aquaculture Plan, Version 2.1*; Fisheries and Oceans Canada, 2017, *Current valid British Columbia aquaculture licence holders*; Canada-Newfoundland and Labrador Offshore Petroleum Board, n.d., *Mapping Information and Shapefiles*; Canada-Nova Scotia Offshore Petroleum Board, *Oil 2019, Maps and Coordinates*, Canada-Nova Scotia Offshore Petroleum Board, 2019, *GIS Information*, Crown-Indigenous Relations and Northern Affairs Canada, 2015, *Oil and Gas Rights*.

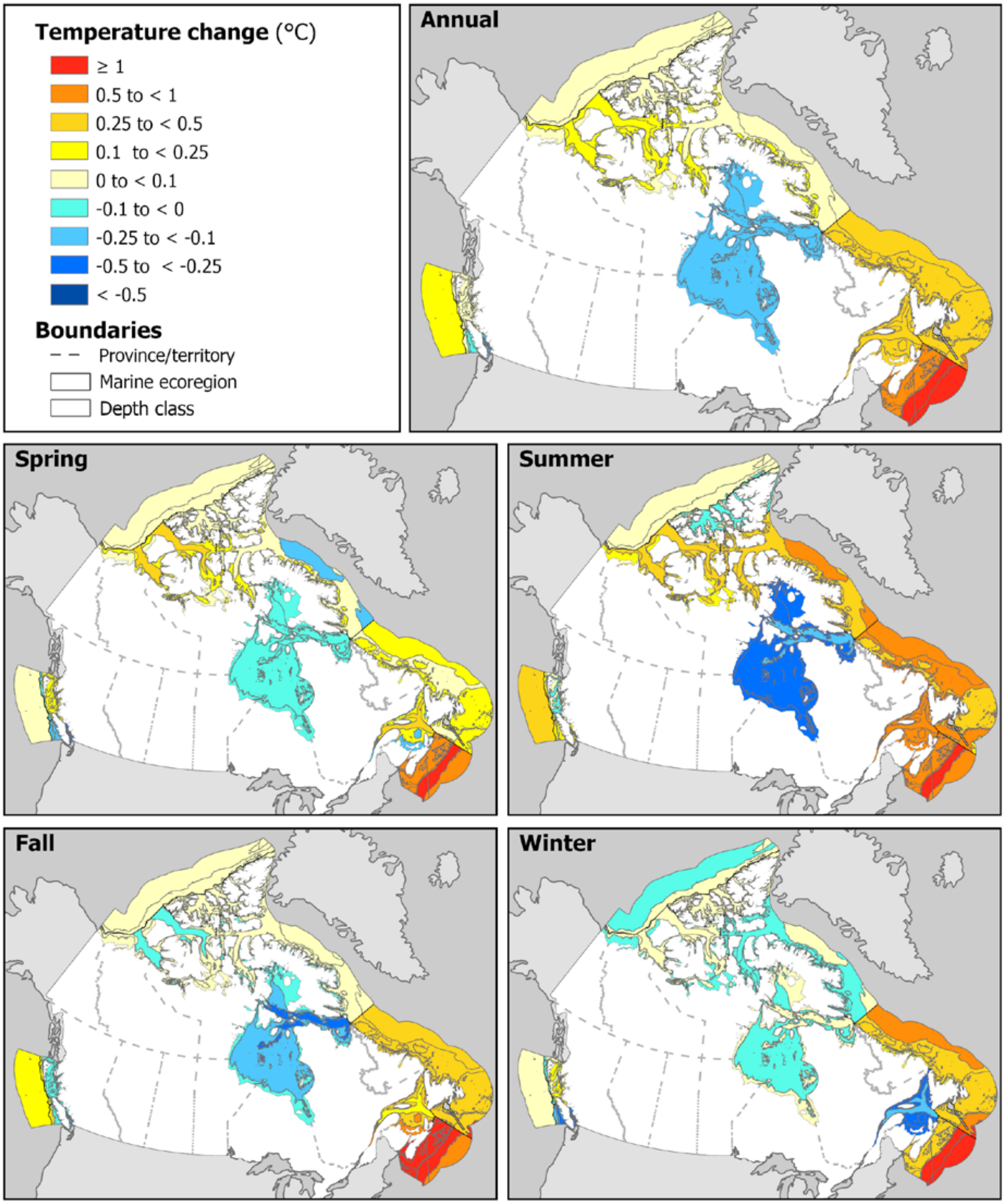
Population size and variation of 2016 fishing and seafood sector-based communities, Pacific and Atlantic coasts, 2001 to 2016



Notes: This map displays population size and variation for census subdivisions (CSDs) for which the fishing and seafood sector is a major source of employment income—defined here as individuals working in these sectors earning 20% or more of total CSD employment income. Data from the 2016 Census of Population were used to identify the 150 coastal CSDs represented on this map. The reference period for income data is the calendar year prior to the census. The fishing and seafood sector, as defined for this map, includes North American Industry Classification Codes: 1141 – Fishing, 1125 – Aquaculture and 3117 Seafood product preparation and packaging.

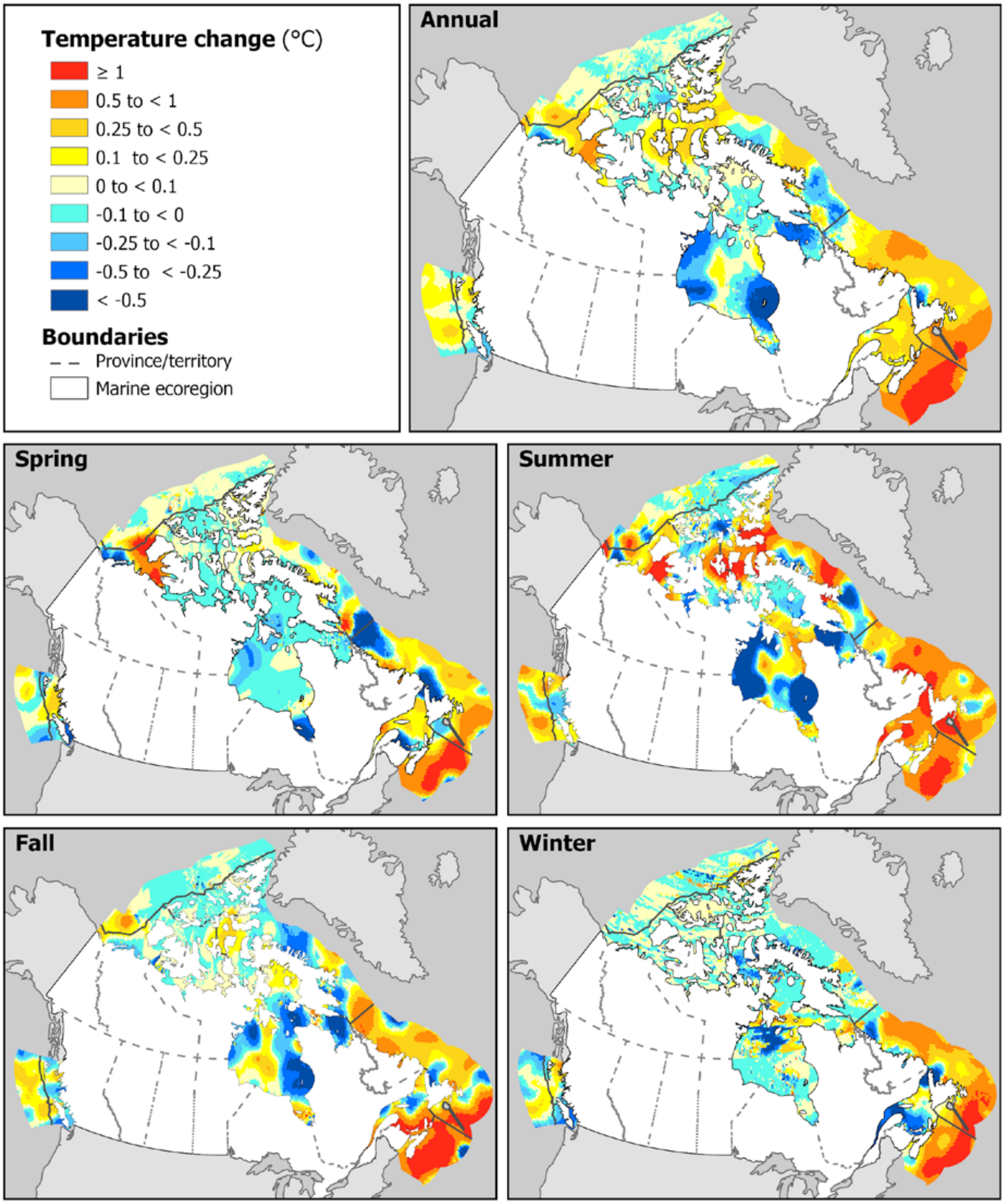
Source: Statistics Canada, Environment and Energy Statistics Division, 2020, special tabulation from the 2001 and 2016 Census of Population.

Sea surface temperature departures (2005 to 2017) from the climate normal, by depth class, marine ecoregion and season



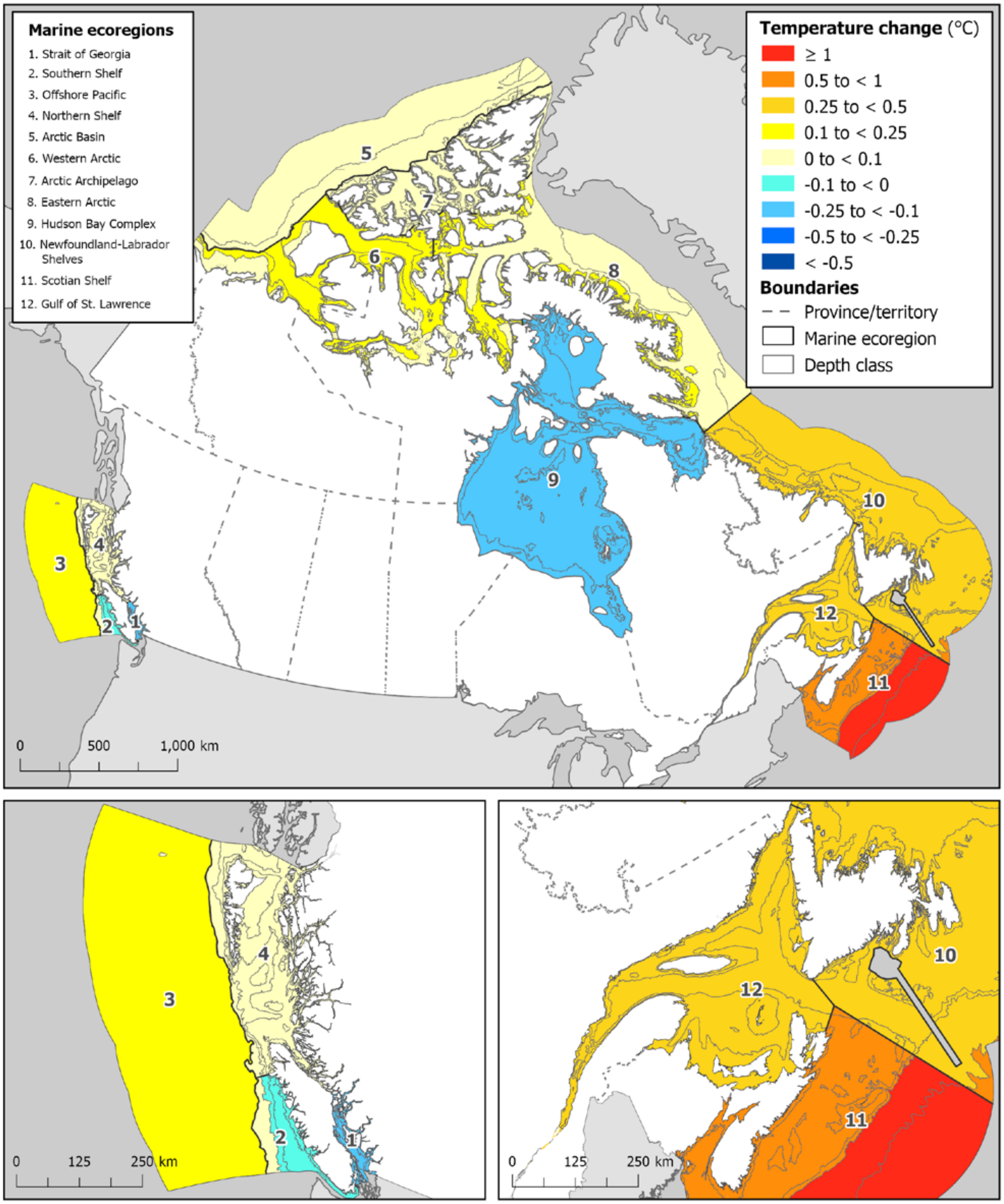
Note: The climate normal is the three decade average of climatological variables from 1981 to 2010. Winter data are from January to March with other seasons following sequentially.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Sea surface temperature departures (2005 to 2017) from the climate normal, by season at quarter degree grid



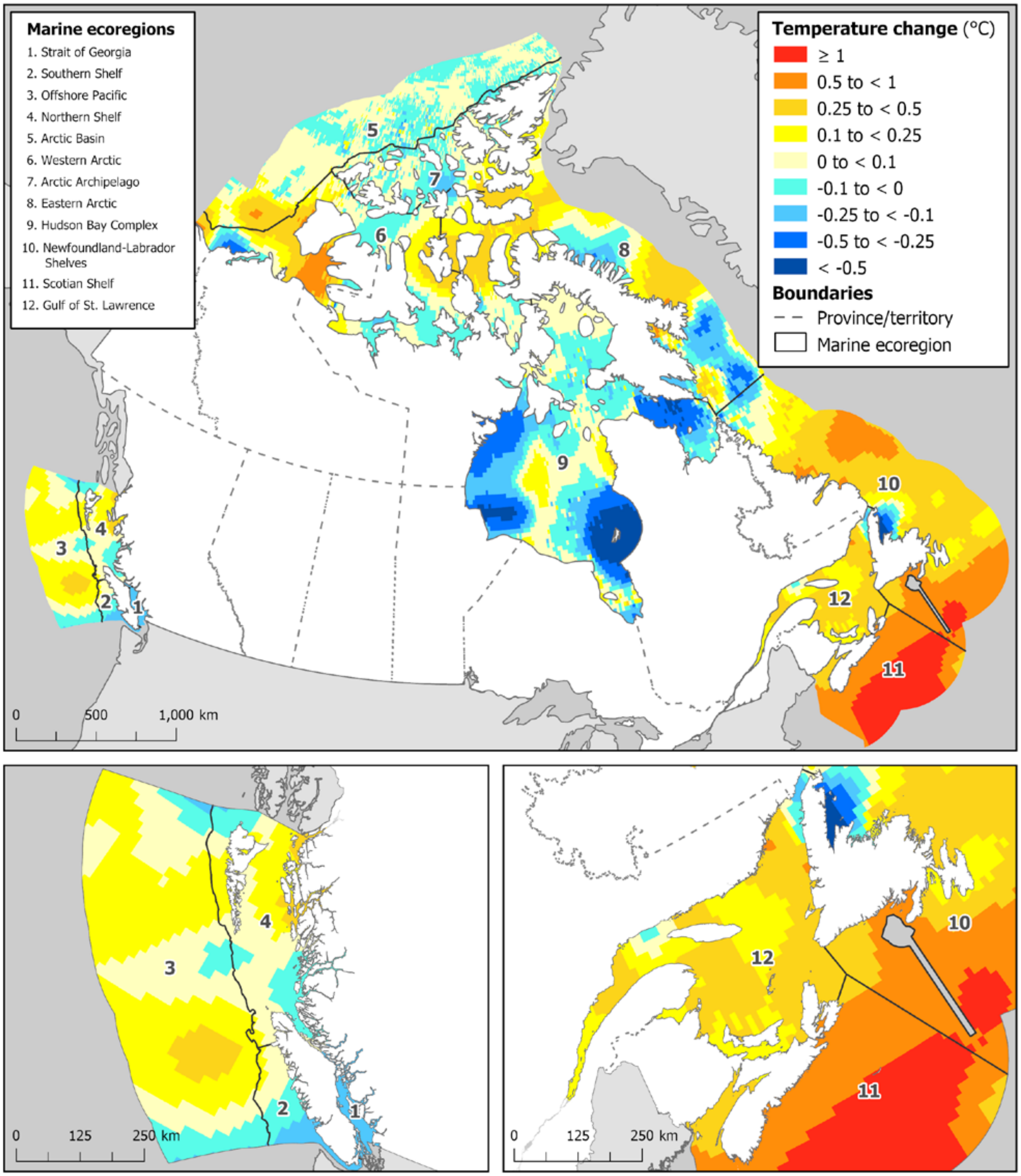
Note: The climate normal is the three decade average of climatological variables from 1981 to 2010. Winter data are from January to March with other seasons following sequentially.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Annual sea surface temperature departures (2005 to 2017) from the climate normal, by depth class, marine ecoregion



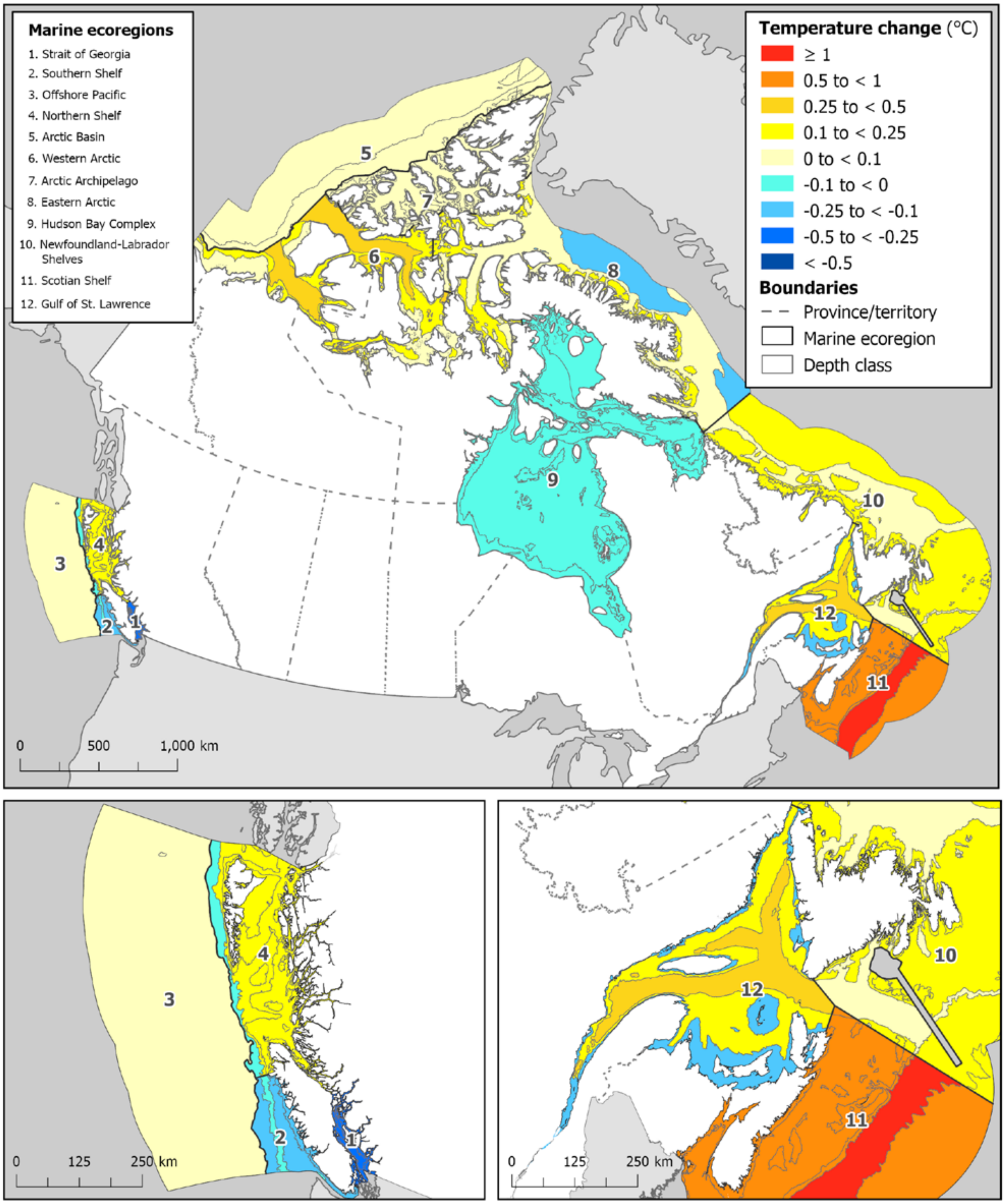
Note: The climate normal is the three decade average of climatological variables from 1981 to 2010.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Annual sea surface temperature departures (2005 to 2017) from climate normal, at quarter degree grid



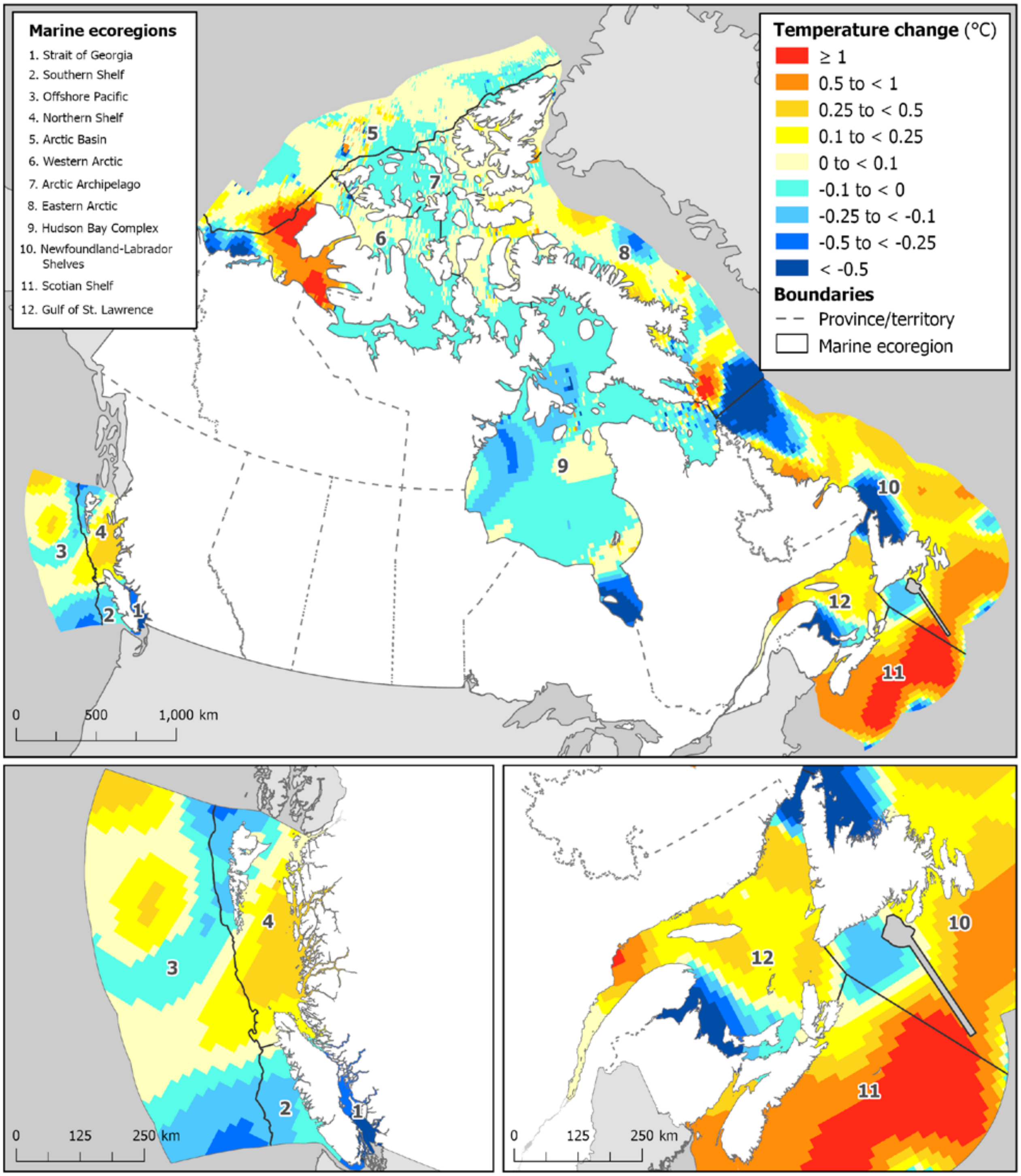
Note: The climate normal is the three decade average of climatological variables from 1981 to 2010.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Spring sea surface temperature departures (2005 to 2017) from the climate normal, by depth class, marine ecoregion



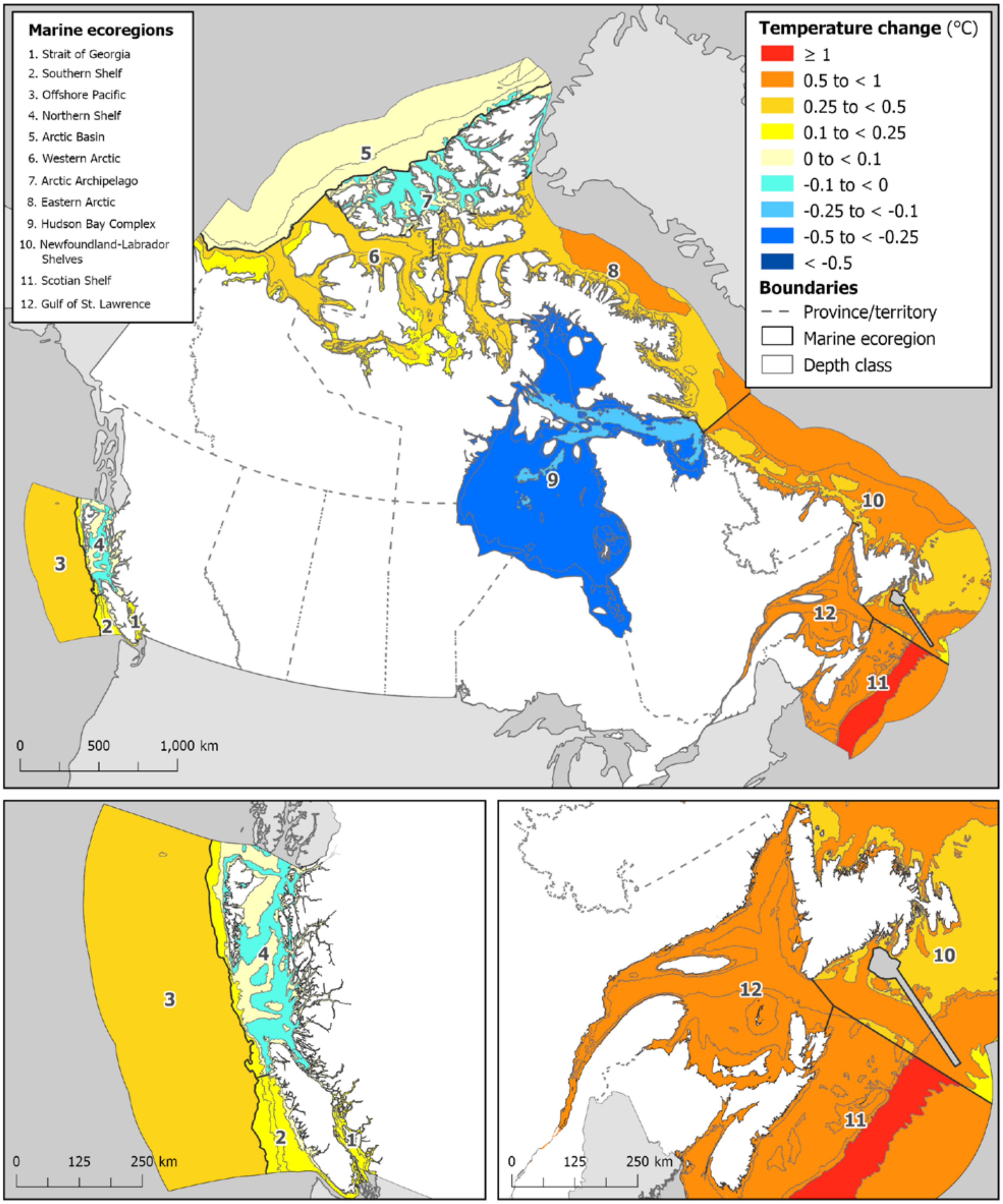
Note: The climate normal is the three-decade average of climatological variables from 1981 to 2010. Spring data are from April to June.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Spring sea surface temperature departures (2005 to 2017) from the climate normal, at quarter degree grid



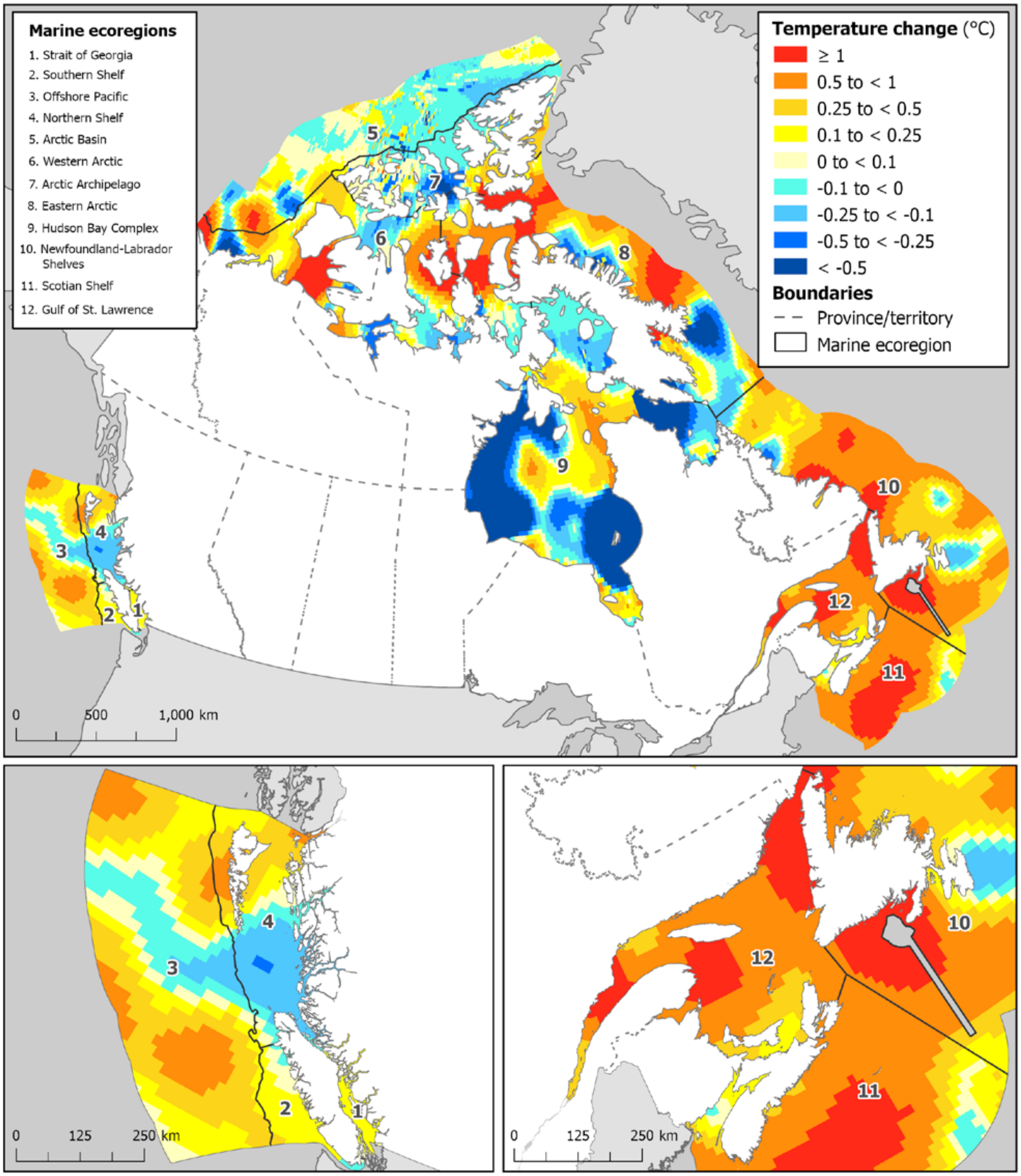
Note: The climate normal is the three-decade average of climatological variables from 1981 to 2010. Spring data are from April to June.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Summer sea surface temperature departures (2005 to 2017) from the climate normal, by depth class, marine ecoregion



Note: The climate normal is the three-decade average of climatological variables from 1981 to 2010. Summer data are from July to September.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

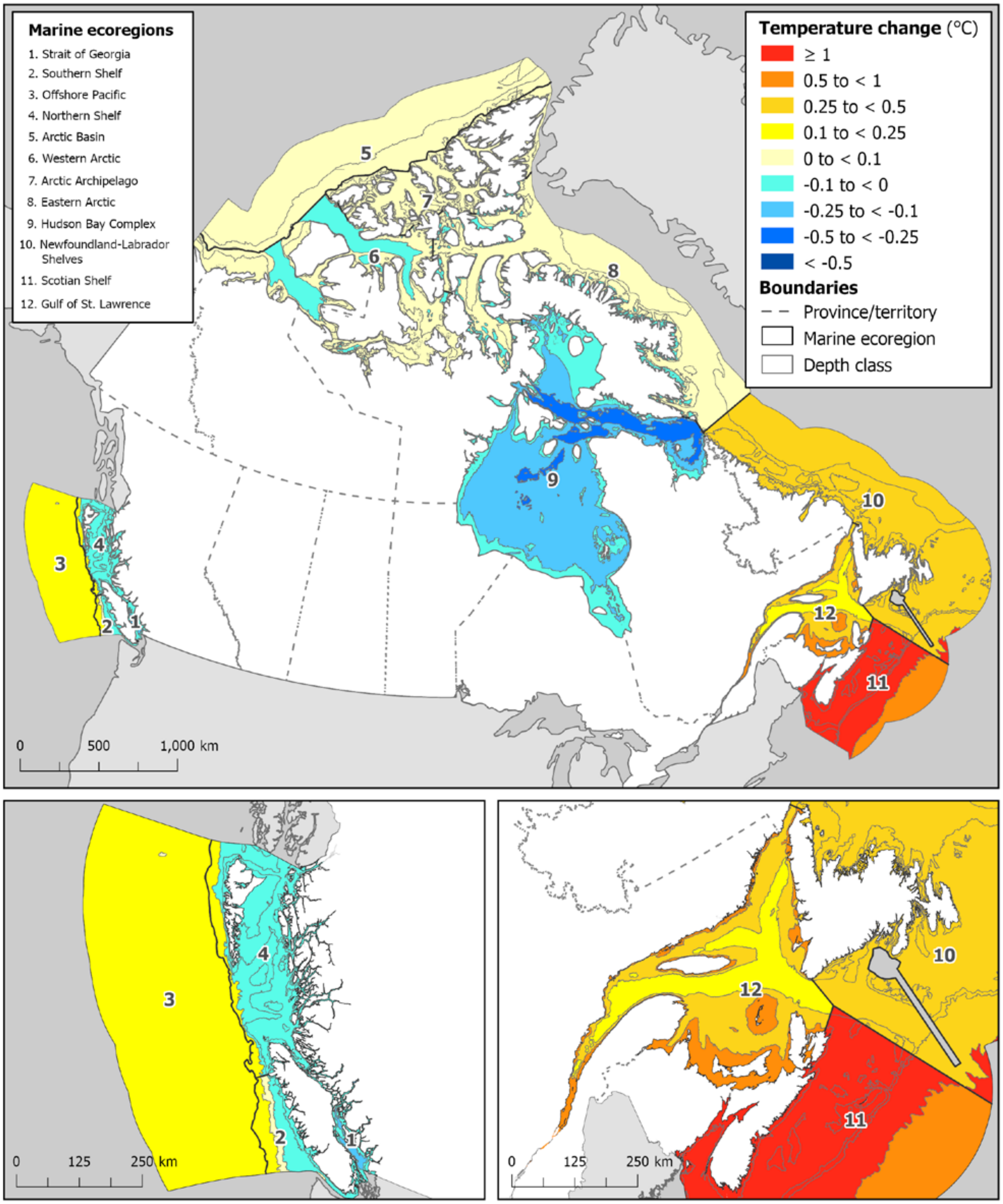
Summer sea surface temperature departures (2005 to 2017) from the climate normal, at quarter degree grid



Note: The climate normal is the three-decade average of climatological variables from 1981 to 2010. Summer data are from July to September.

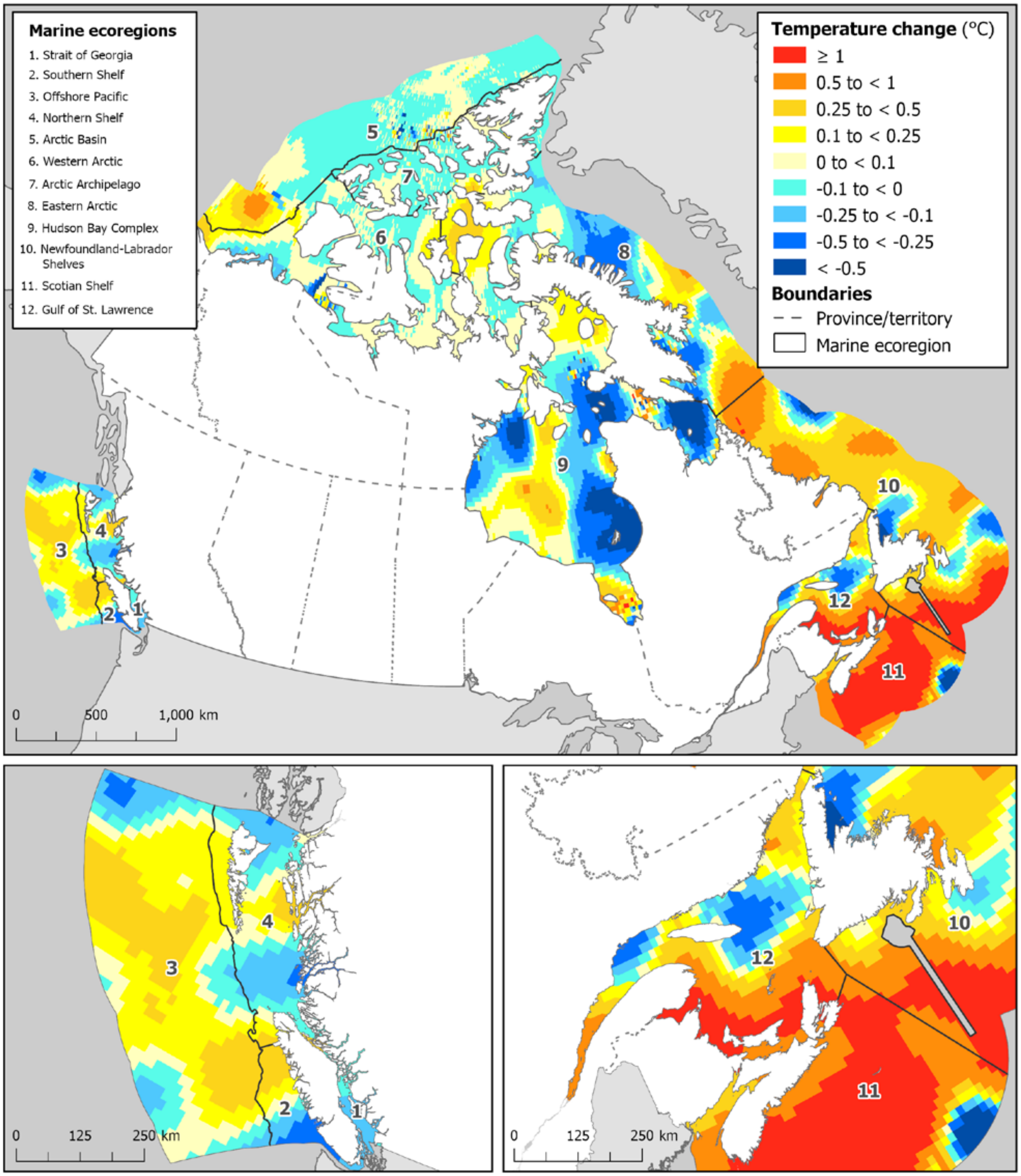
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Fall sea surface temperature departures (2005 to 2017) from the climate normal, by depth class, marine ecoregion



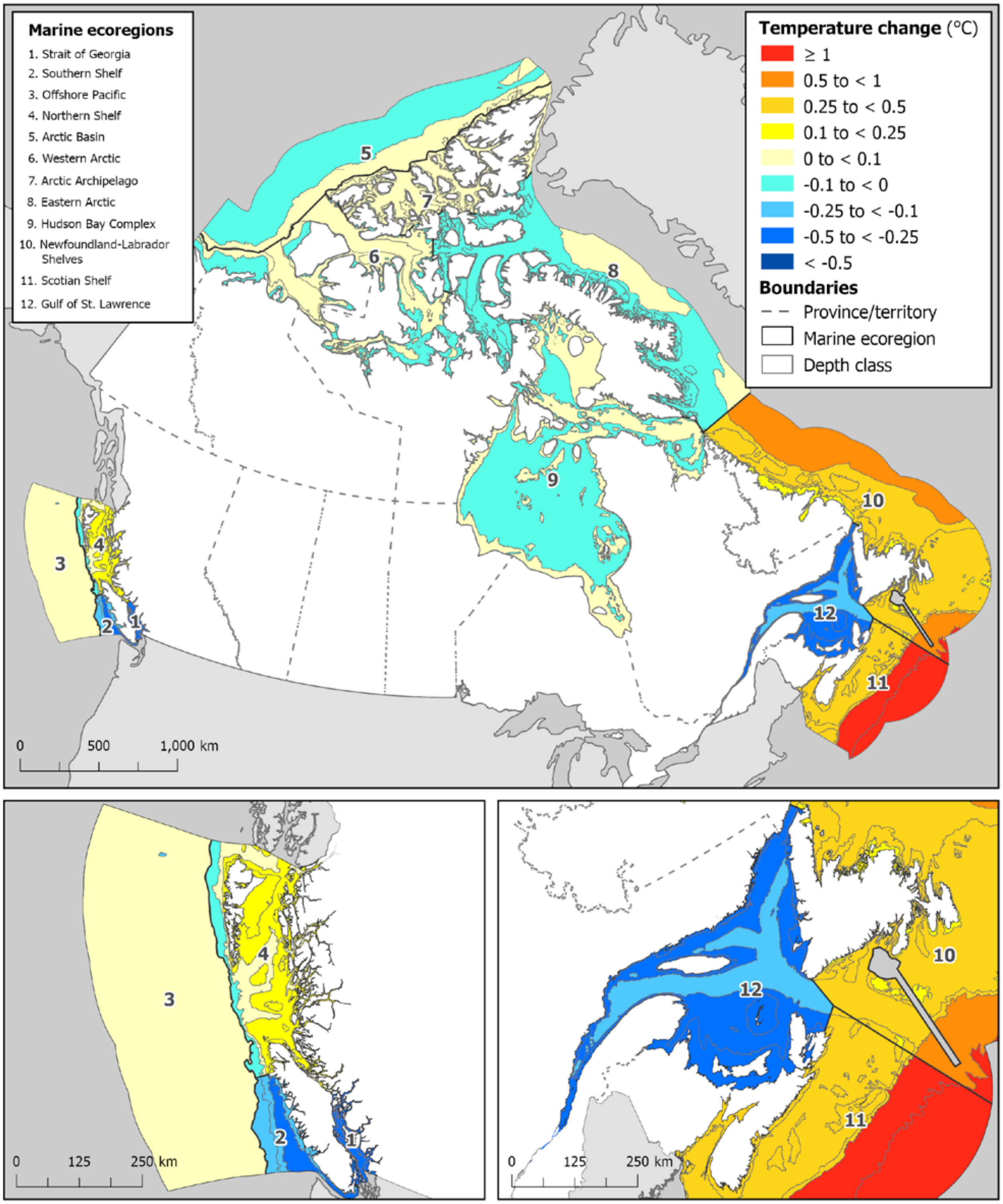
Note: The climate normal is the three-decade average of climatological variables from 1981 to 2010. Fall data are from October to December.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Fall sea surface temperature departures (2005 to 2017) from the climate normal, at quarter degree grid



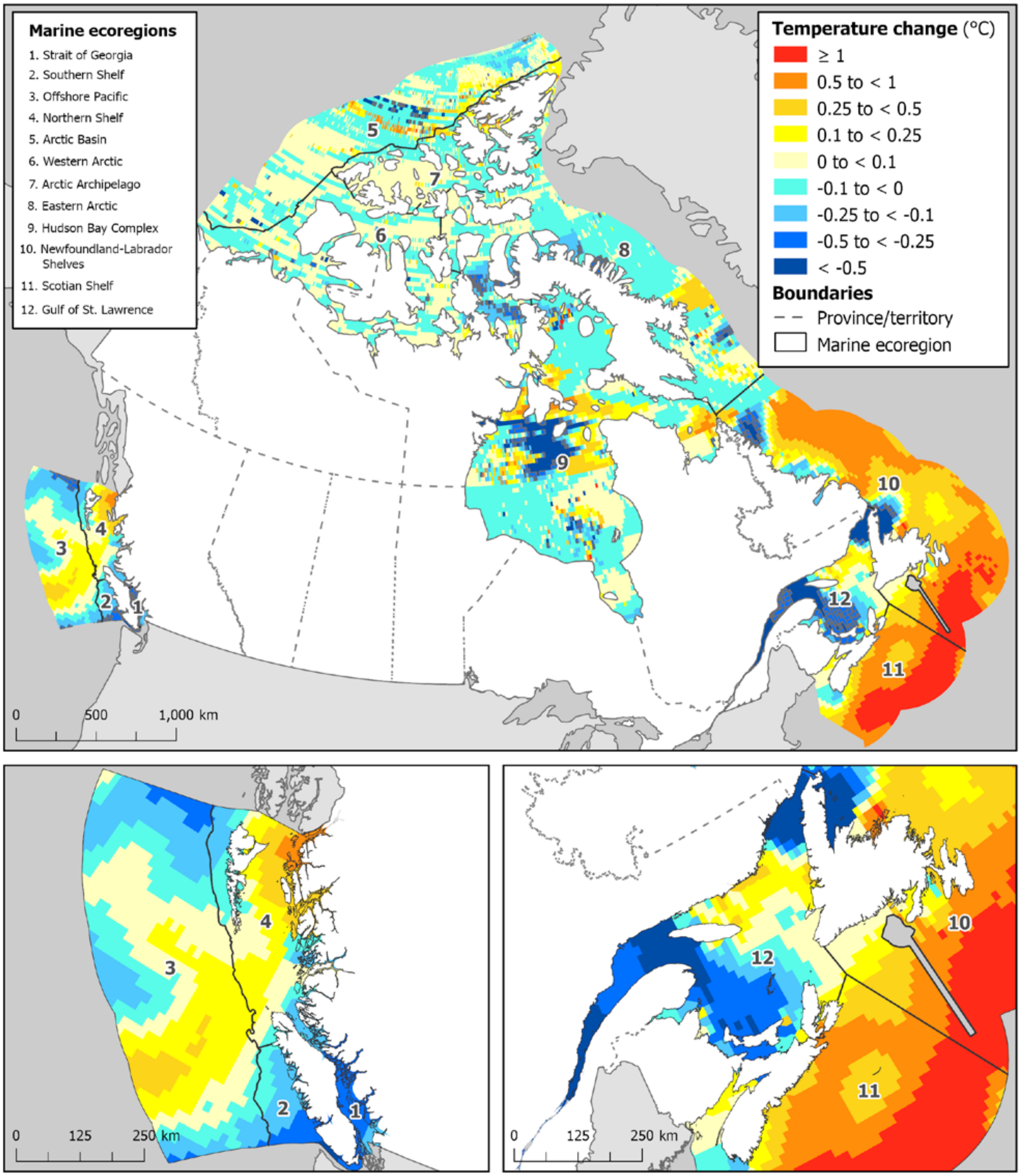
Note: The climate normal is the three-decade average of climatological variables from 1981 to 2010. Fall data are from October to December.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Winter sea surface temperature departures (2005 to 2017) from the climate normal, by depth class, marine ecoregion



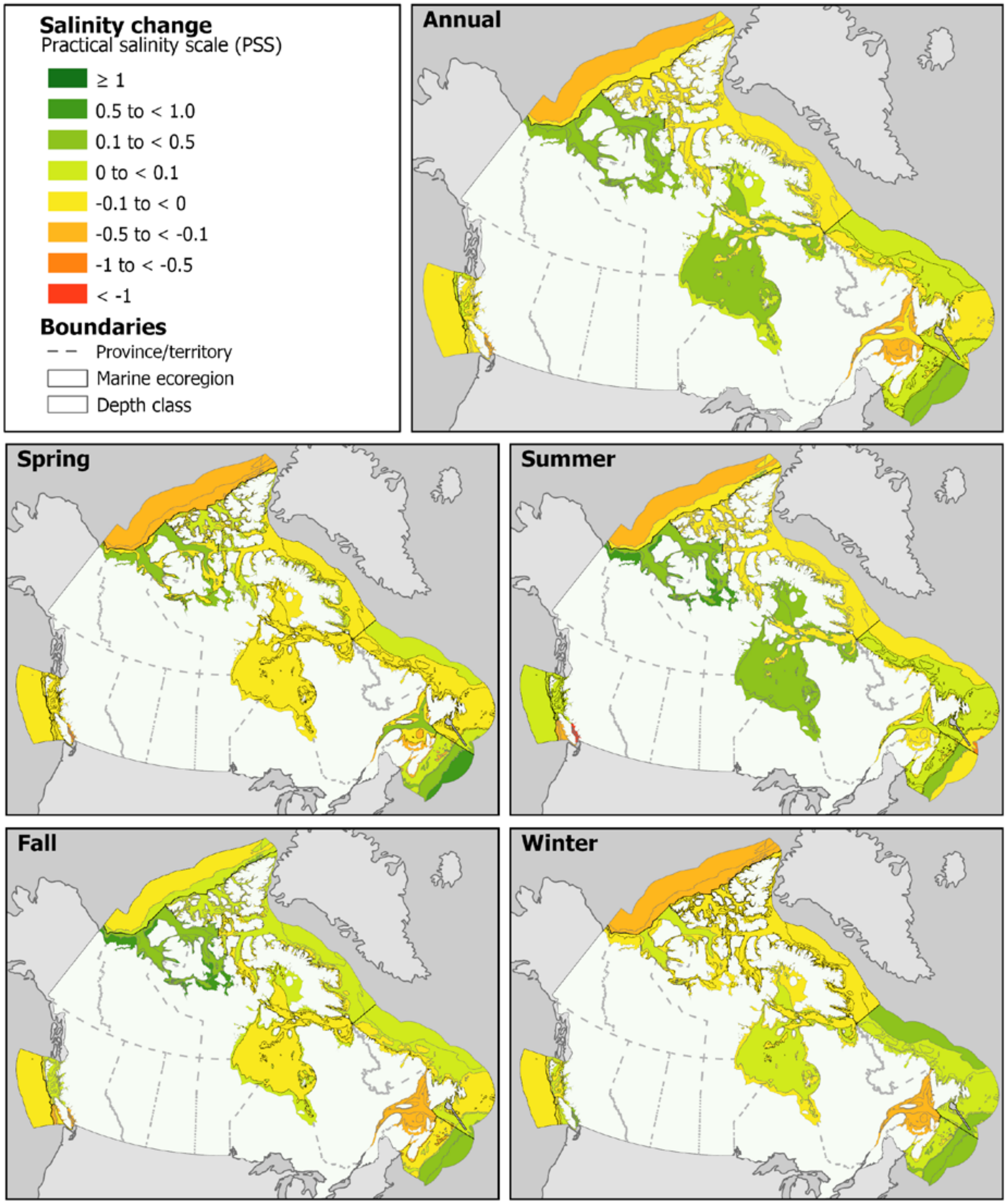
Note: The climate normal is the three decade average of climatological variables from 1981 to 2010. Winter data are from January to March.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

Winter sea surface temperature departures (2005 to 2017) from the climate normal, at quarter degree grid



Note: The climate normal is the three decade average of climatological variables from 1981 to 2010. Winter data are from January to March.
Source: Locarnini, R. A., et al., 2018, *World Ocean Atlas 2018, Volume 1: Temperature,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 81, 52 pp.

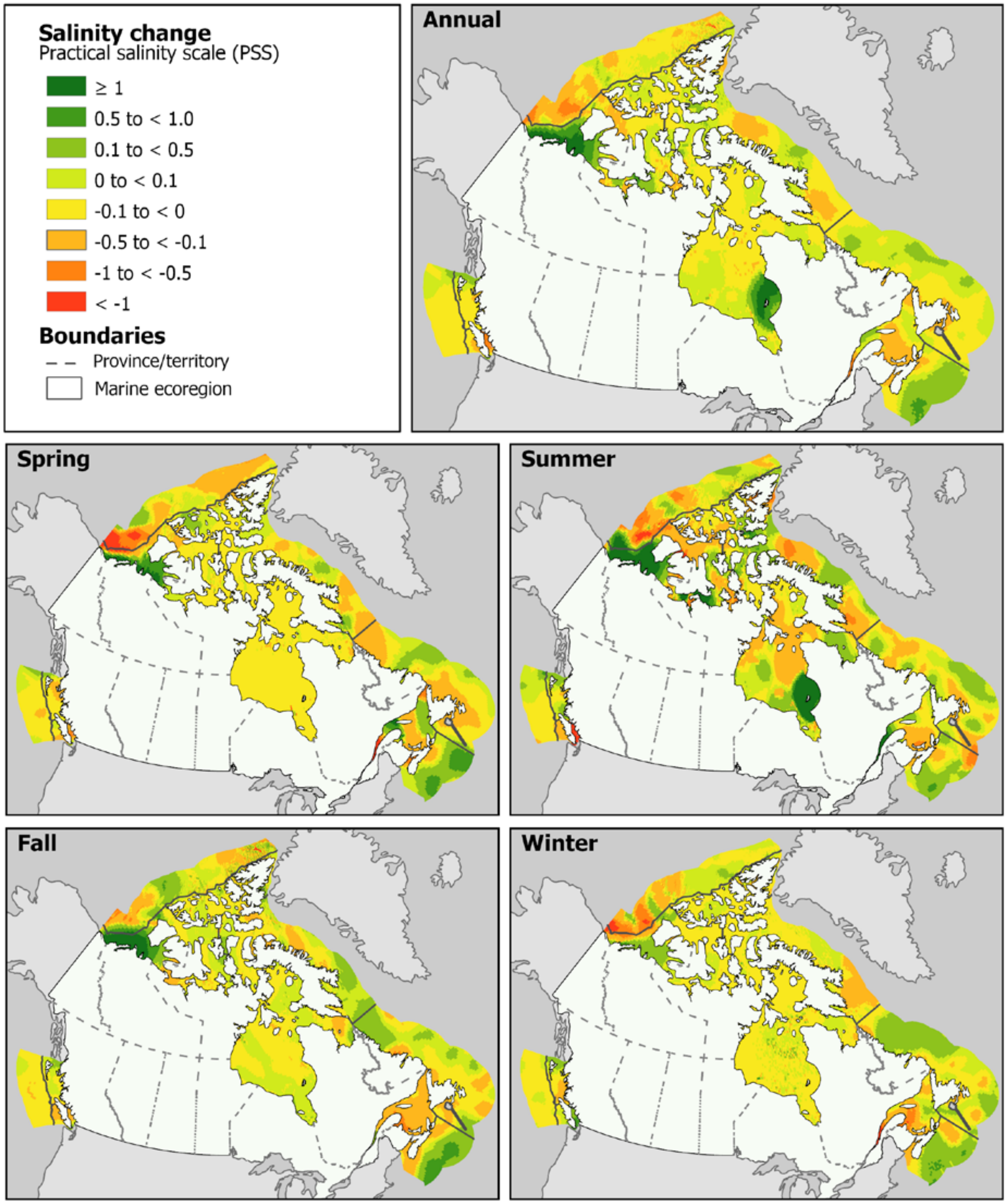
Sea surface salinity departures (2005 to 2017) from the climate normal reference period, by depth class, marine ecoregion and season



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Winter data are from January to March with other seasons following sequentially. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/ . Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modelling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

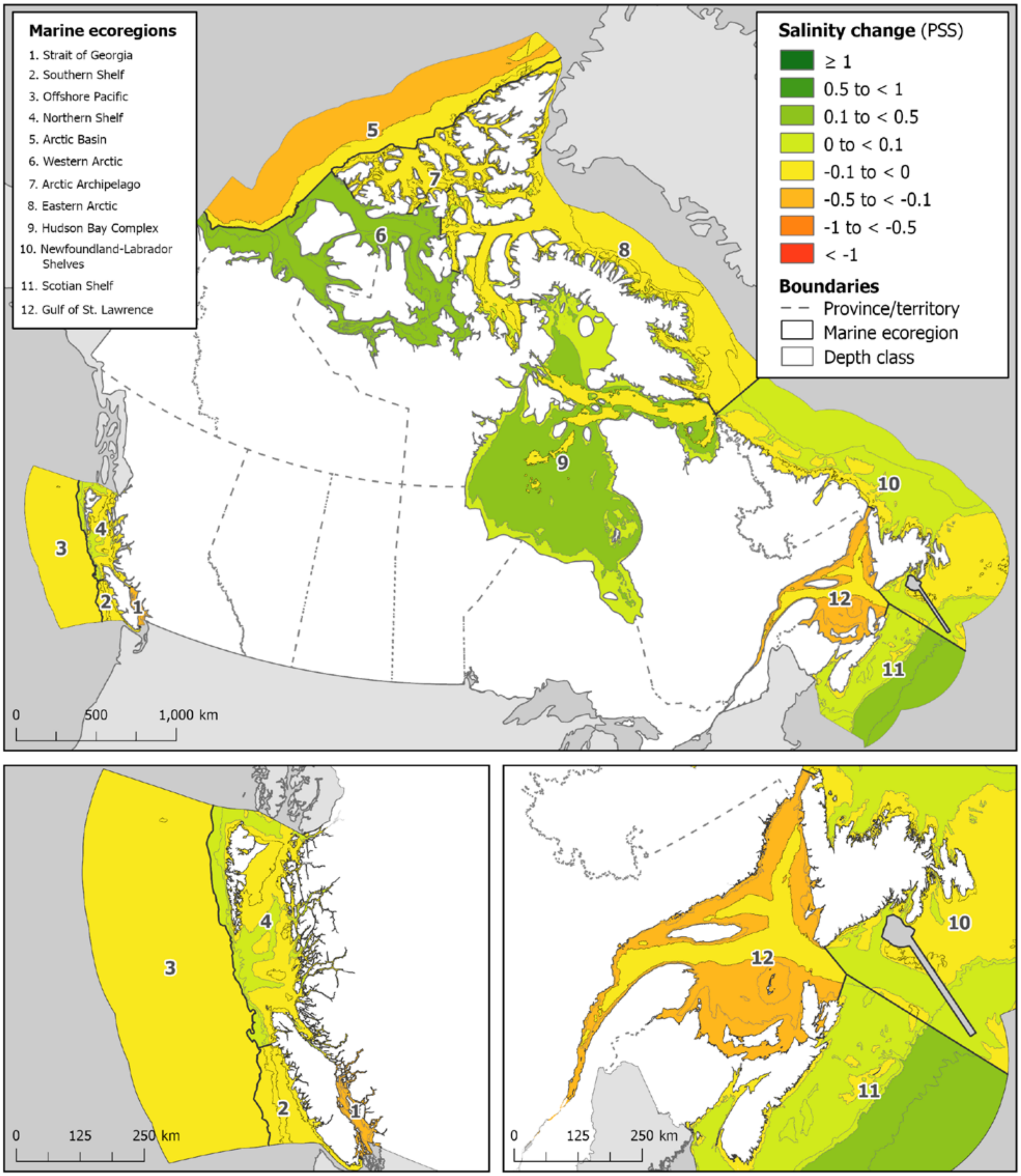
Sea surface salinity departures (2005 to 2017) from the climate normal reference period, by season at quarter degree grid



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Winter data are from January to March with other seasons following sequentially. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modelling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

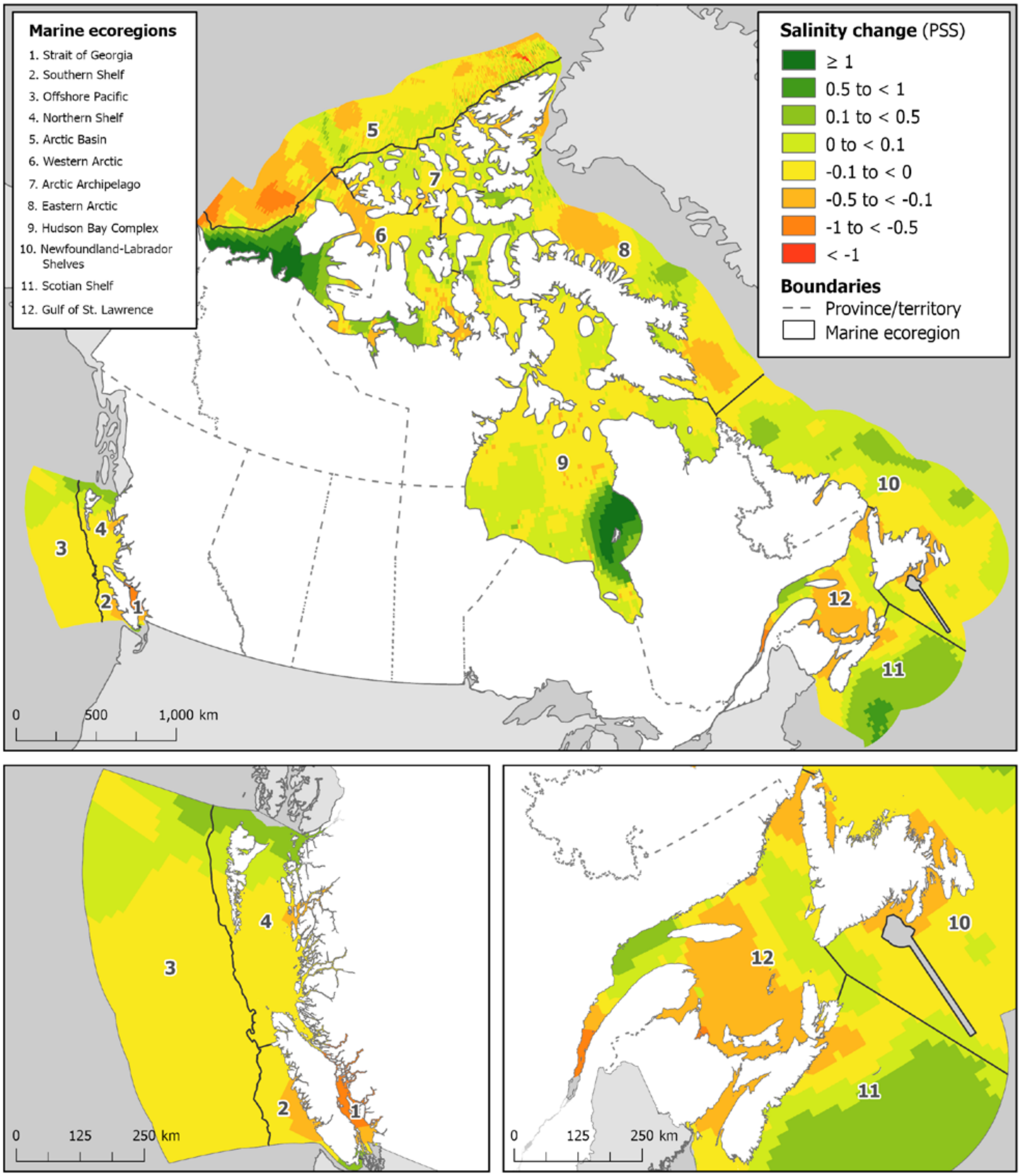
Annual sea surface salinity departures (2005 to 2017) from the climate normal reference period, by depth class, marine ecoregion



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modelling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity,* A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

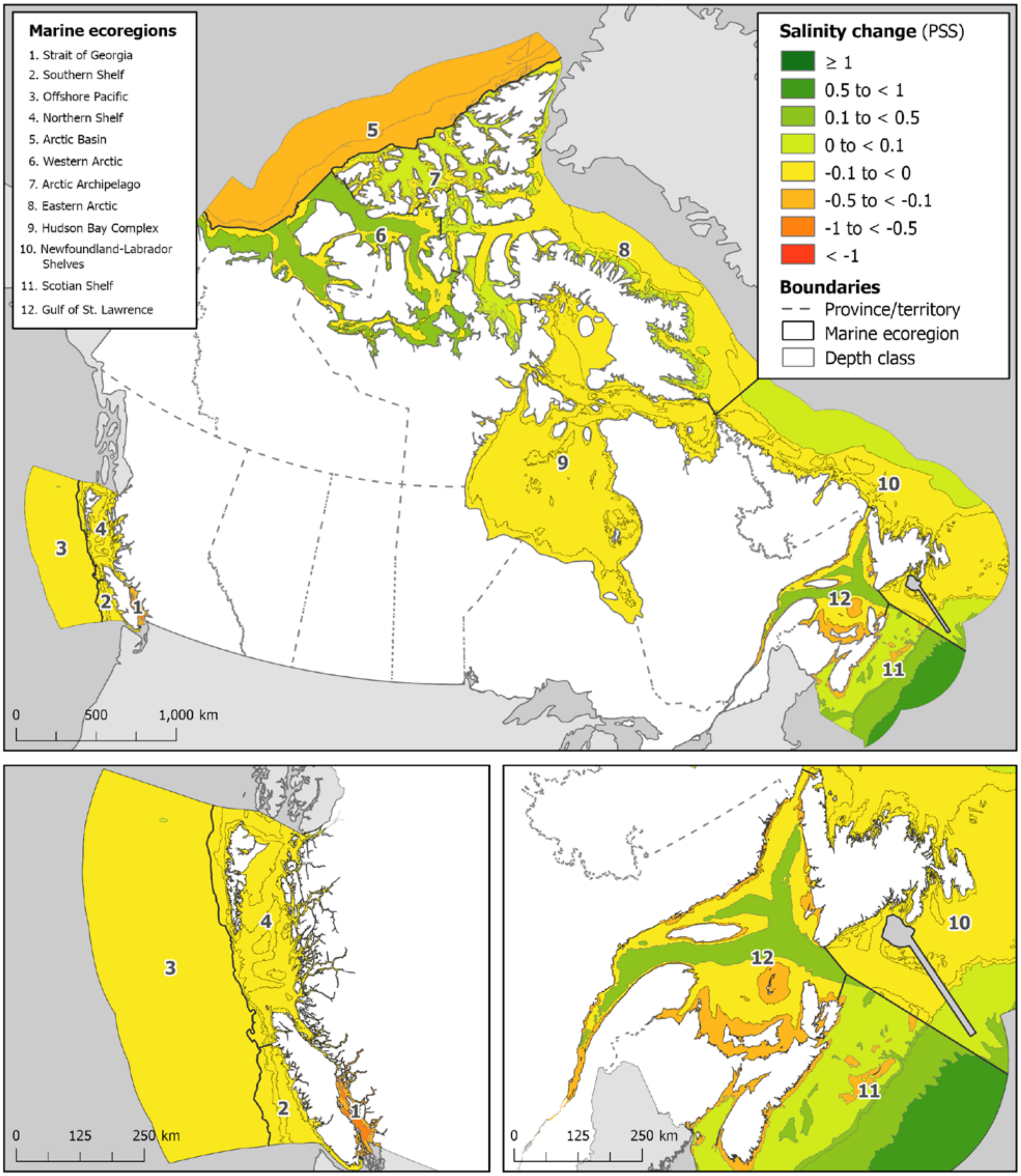
Annual sea surface salinity departures from climate normal (2005 to 2017) reference period, at quarter degree grid



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modeling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

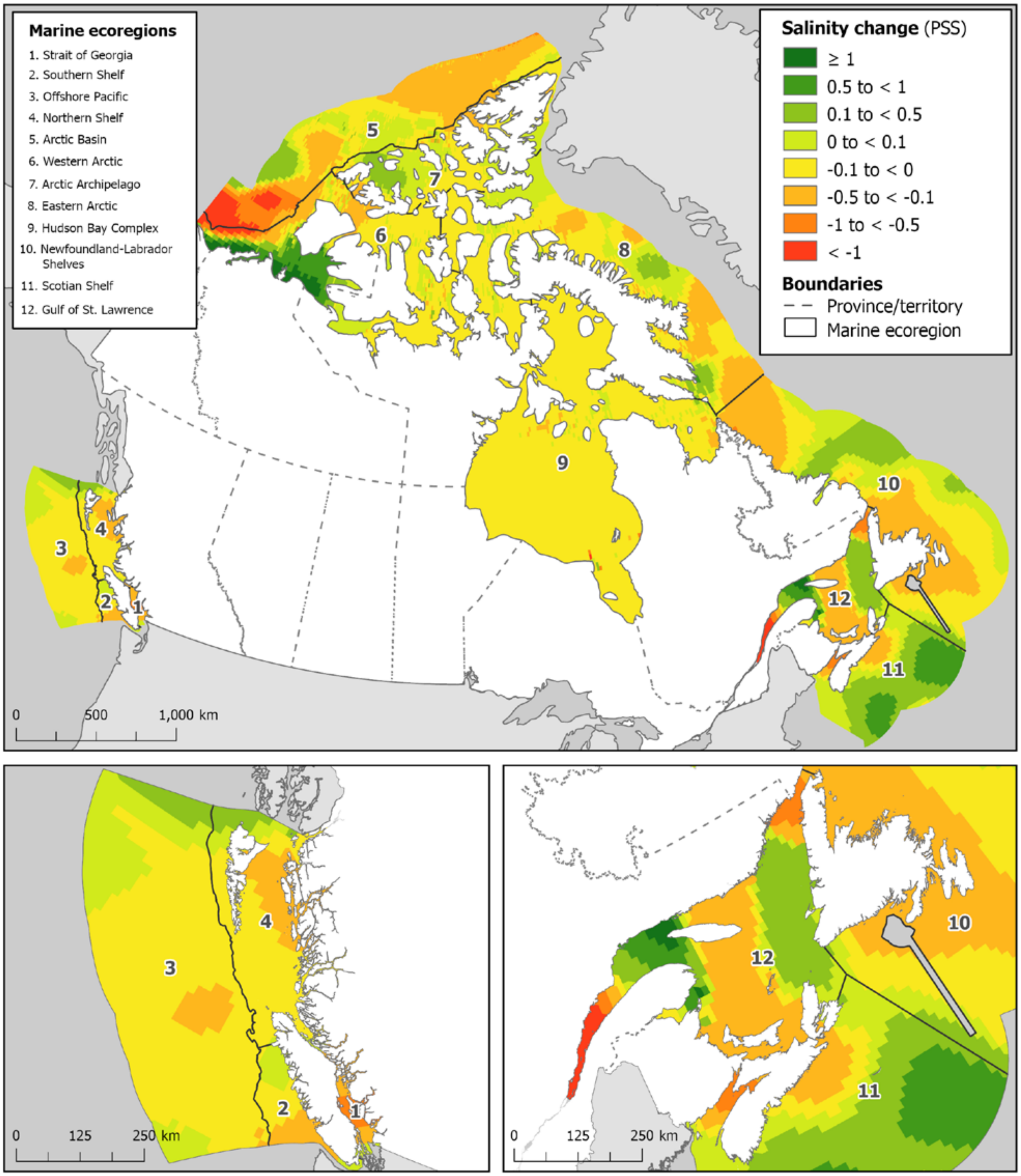
Spring sea surface salinity departures (2005 to 2017) from the climate normal reference period, by depth class, marine ecoregion



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Spring data are from April to June. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

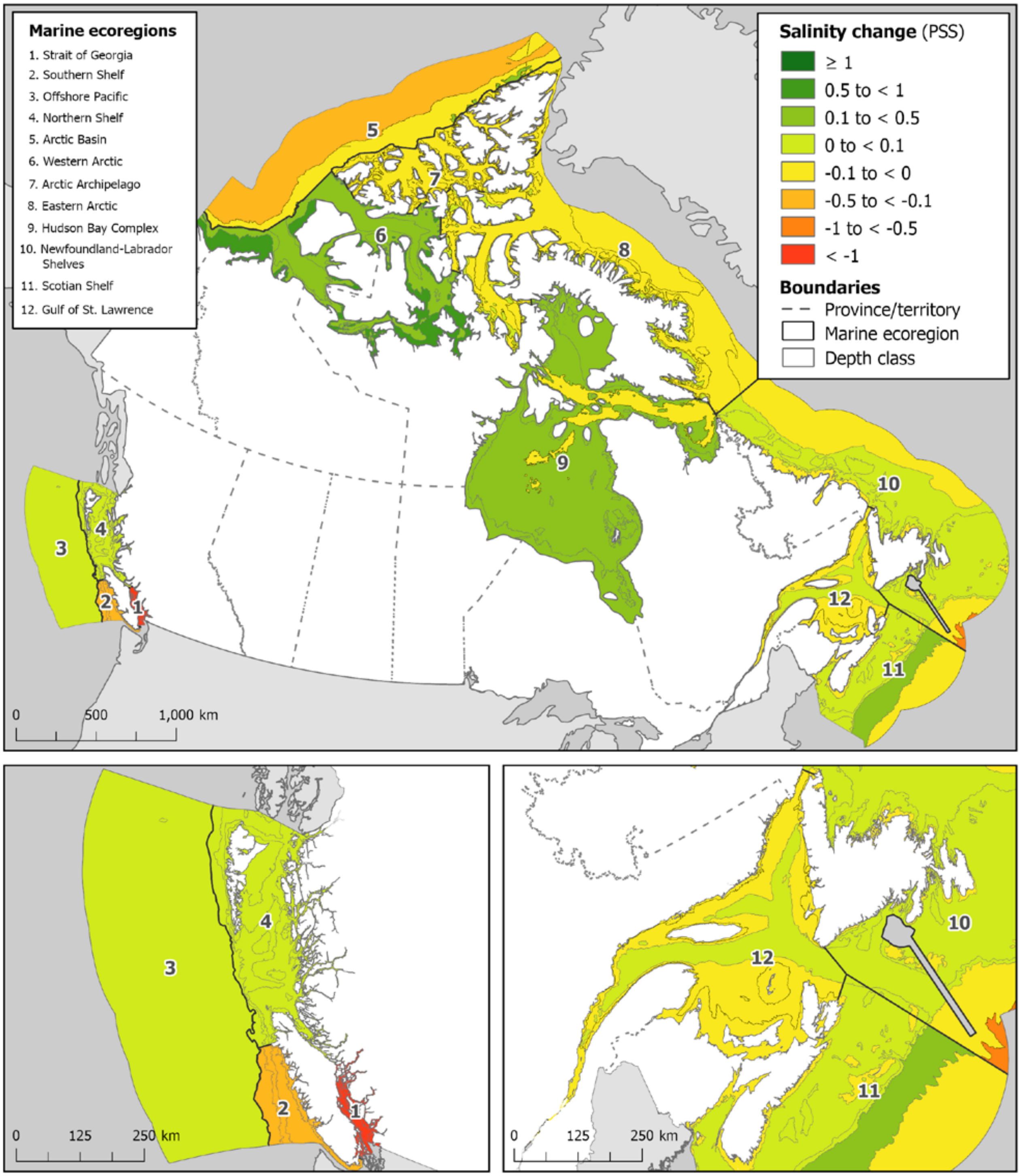
Spring sea surface salinity departures (2005 to 2017) from the climate normal reference period, at quarter degree grid



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modeling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

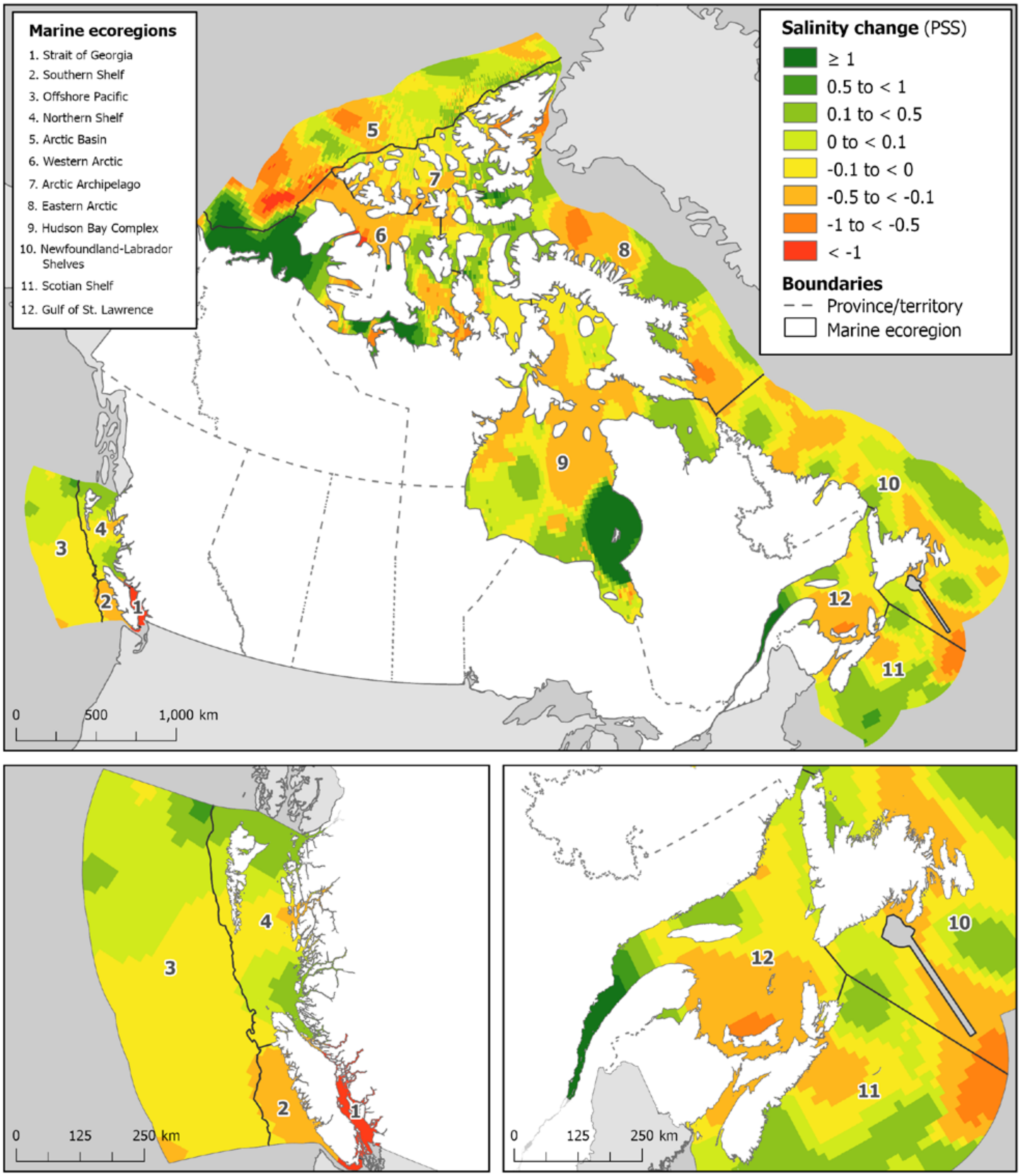
Summer sea surface salinity departures (2005 to 2017) from the climate normal reference period, by depth class, marine ecoregion



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Summer data are from July to September. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

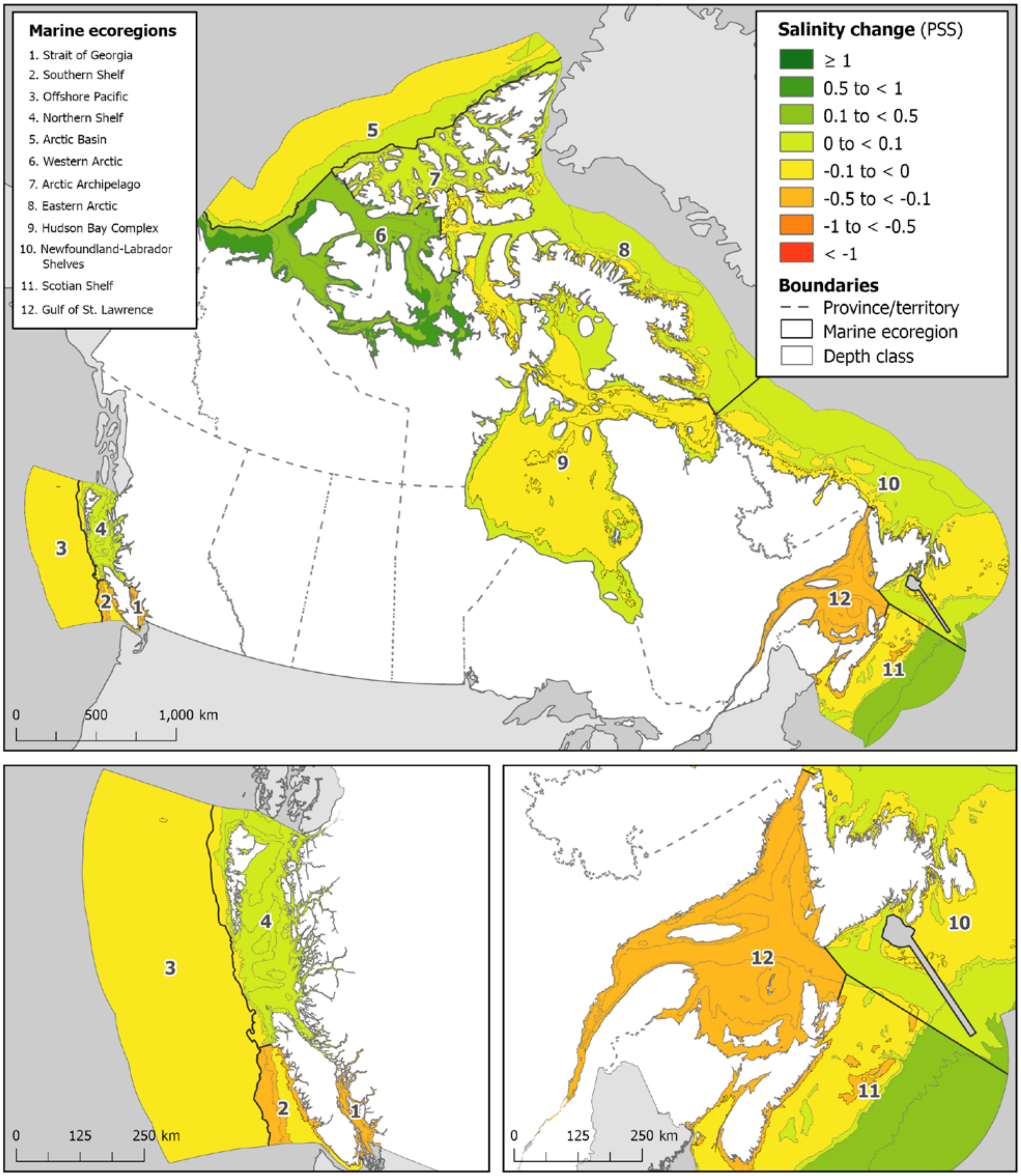
Summer sea surface salinity departures (2005 to 2017) from the climate normal reference period, at quarter degree grid



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modeling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

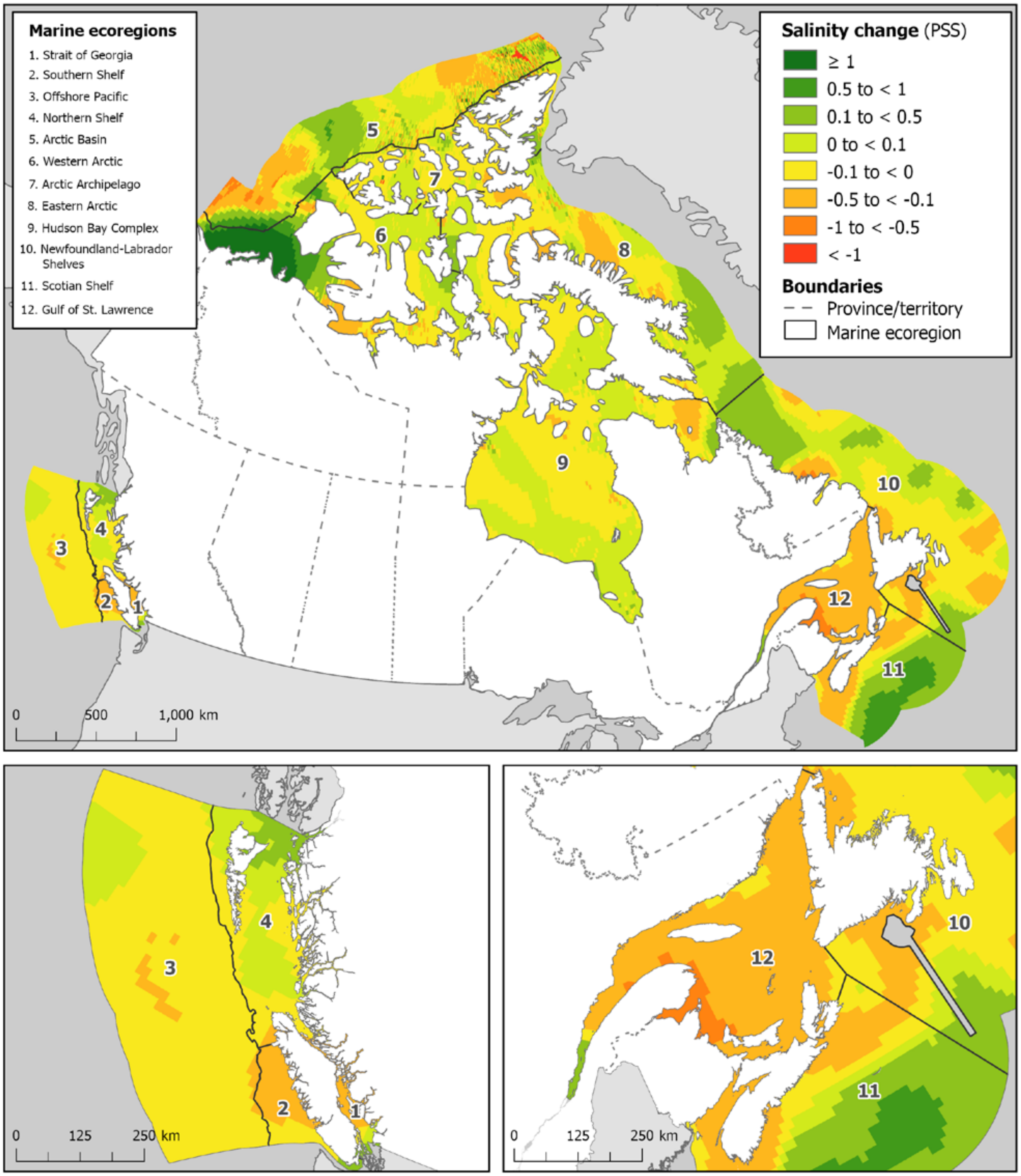
Fall sea surface salinity departures (2005 to 2017) from the climate normal reference period, by depth class, marine ecoregion



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Fall data are from October to December. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

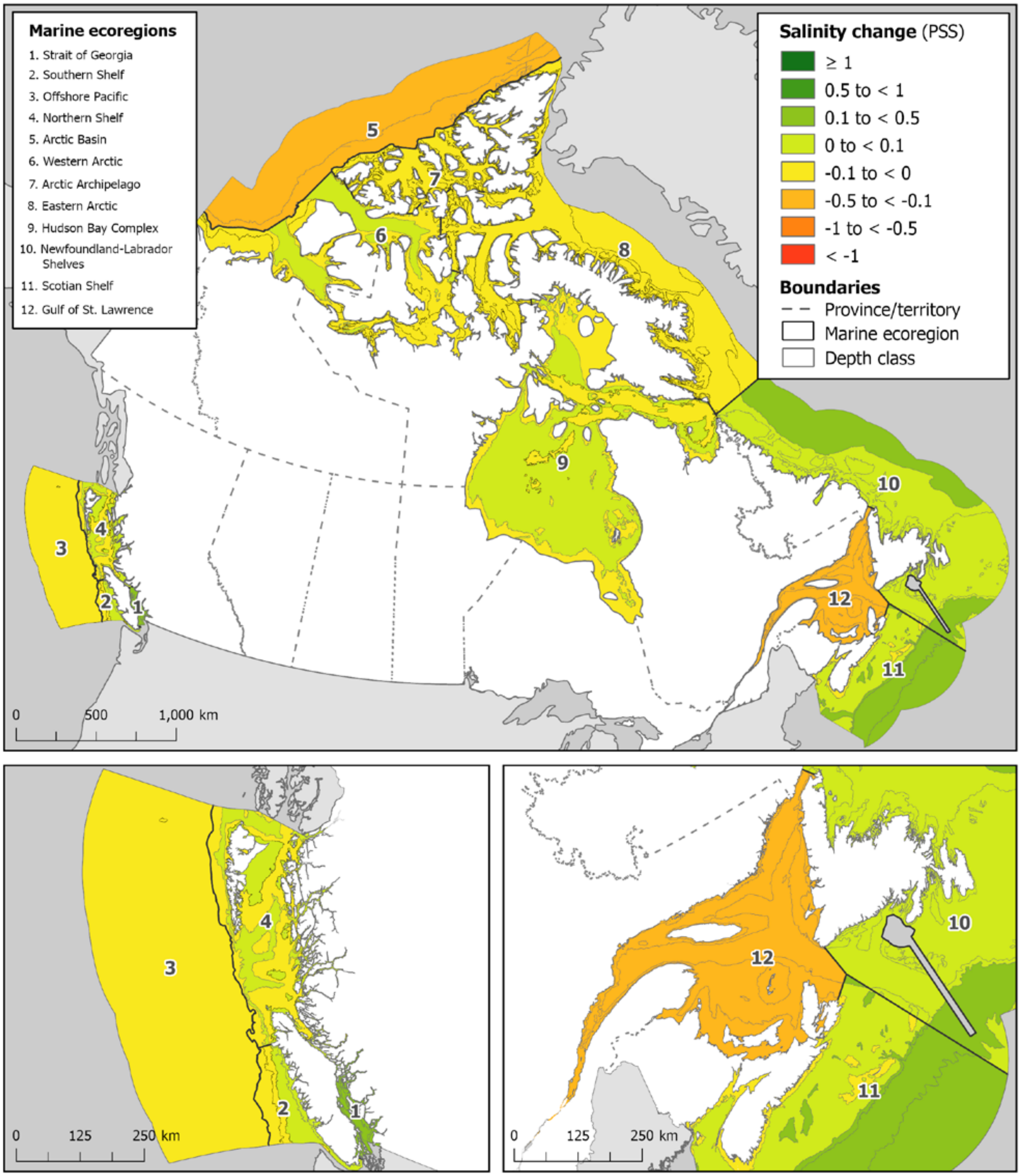
Fall sea surface salinity departures (2005 to 2017) from the climate normal reference period, at quarter degree grid



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modeling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

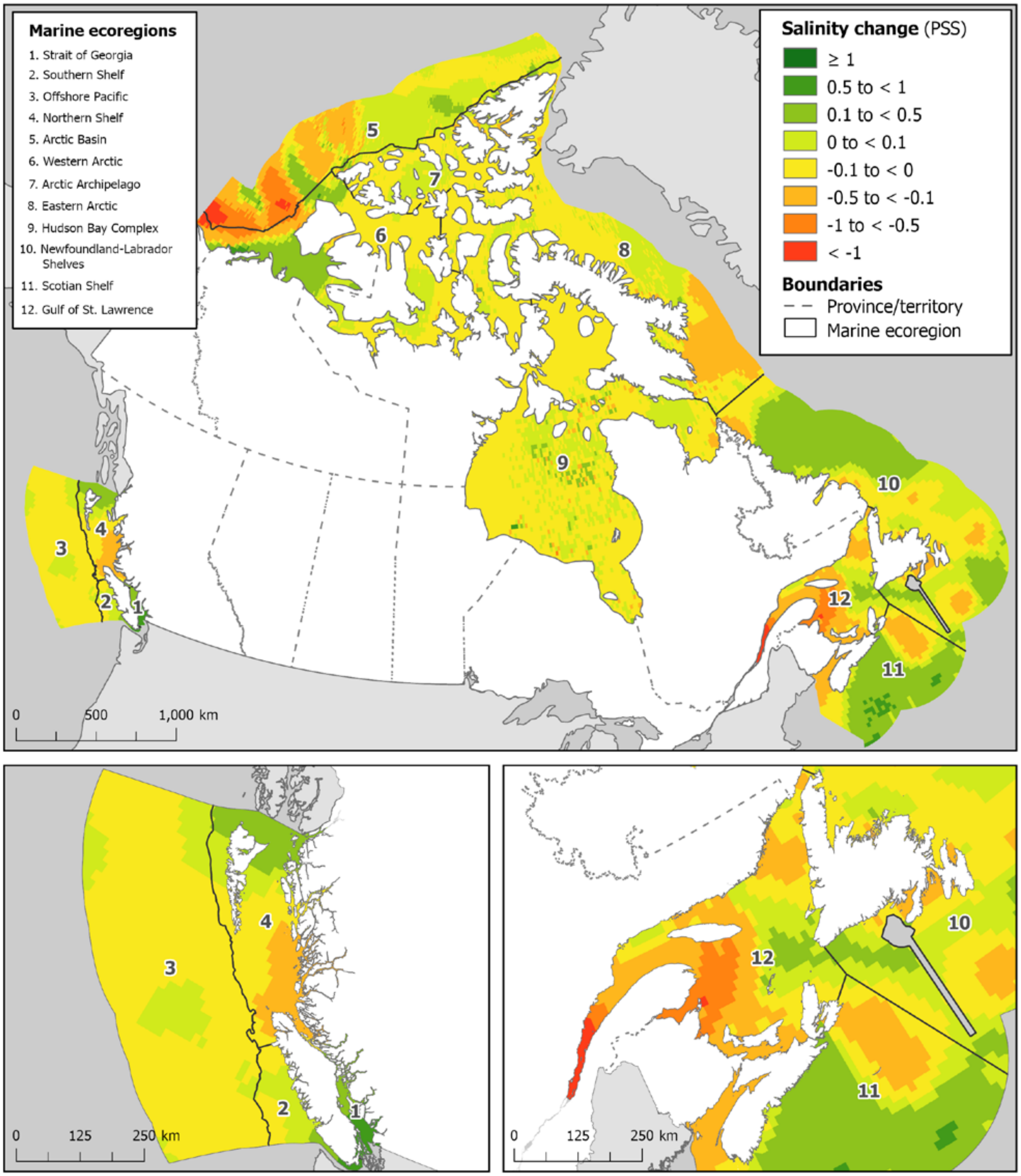
Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

Winter sea surface salinity departures (2005 to 2017) from the climate normal reference period, by depth class, marine ecoregion



Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Winter data are from January to March. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions.
Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

Winter sea surface salinity departures (2005 to 2017) from the climate normal reference period, at quarter degree grid

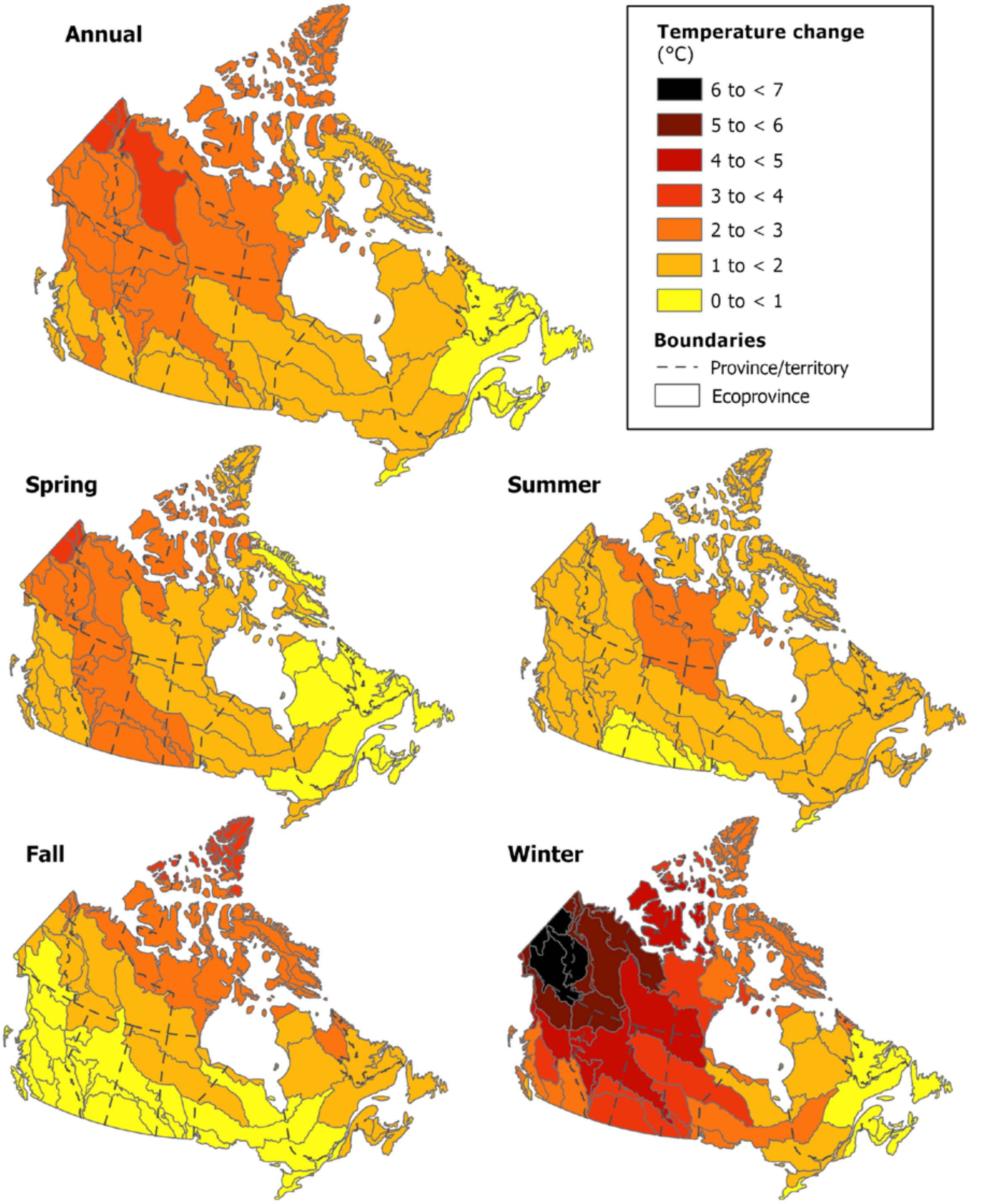


Notes: The climate normal is the three decade average of climatological variables from 1981 to 2010. Data are reported using the unitless Practical Salinity Scale (PSS), for more information please see http://salinometry.com/pss-78/. Data for salinity in the Arctic Ocean are sparser than in other regions. In particular, winter salinity data are more scarce and the modeling methods used could result in artificially high salinities for this season in some regions of the Arctic Ocean.

Source: Zweng, M. M., et al., 2018, *World Ocean Atlas 2018, Volume 2: Salinity*, A. Mishonov Technical Ed., NOAA Atlas NESDIS 82, 50 pp.

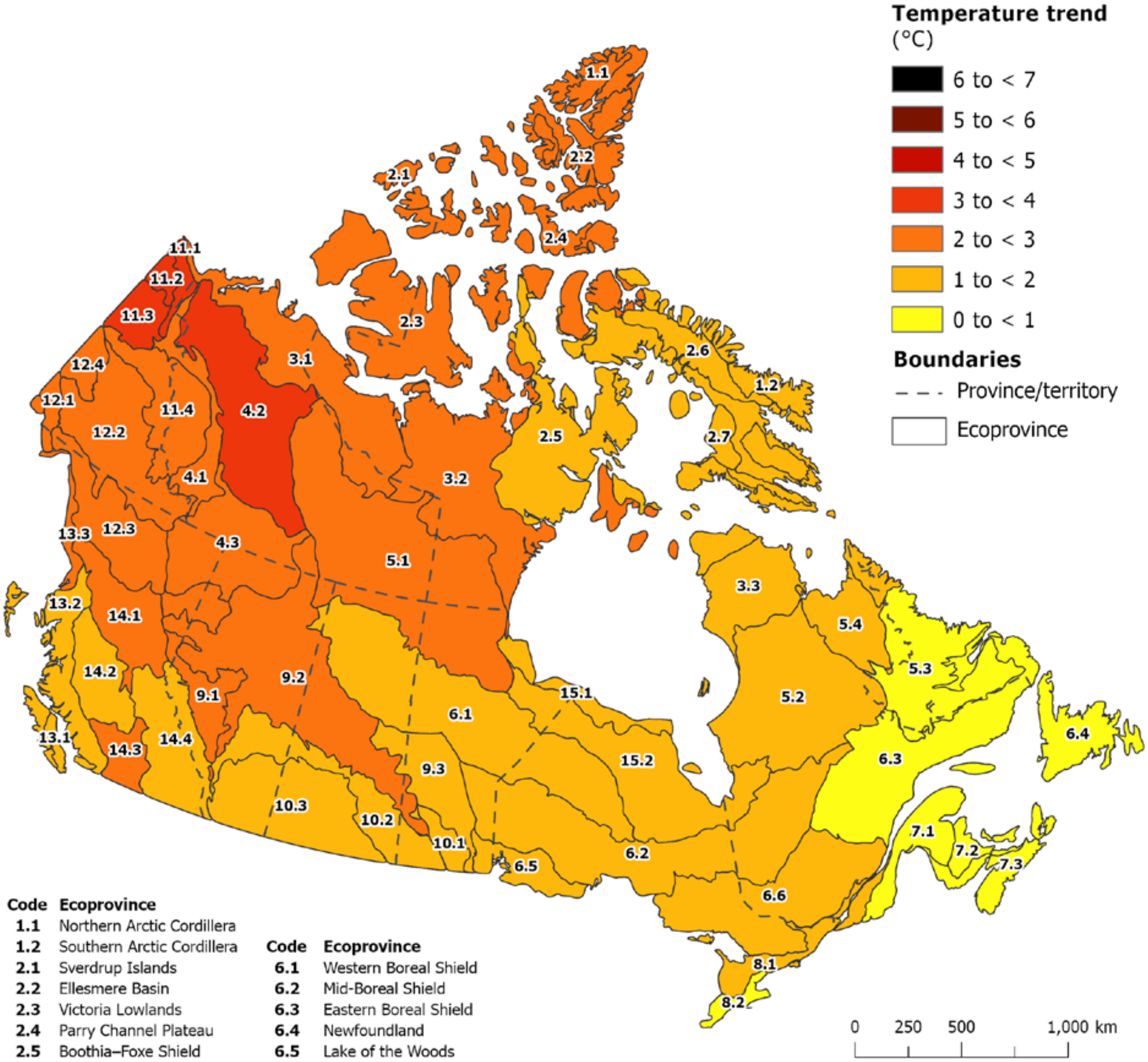
Ecosystem change maps

Temperature change, annual and all seasons, by ecoprovince, 1948 to 2016



Notes: Temperature change (1948 to 2016) refers to the linear trend of temperature departures from the 1961 to 1990 climate normal. Caution should be exercised when analyzing change results in the North because of lower climate station densities. Significance levels are not available. Winter data are from December to February with other seasons following sequentially.
Sources: Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD)*; ECCC, *Climate Trends and Variations Bulletin.*

Annual temperature change, by ecoprovince, 1948 to 2016

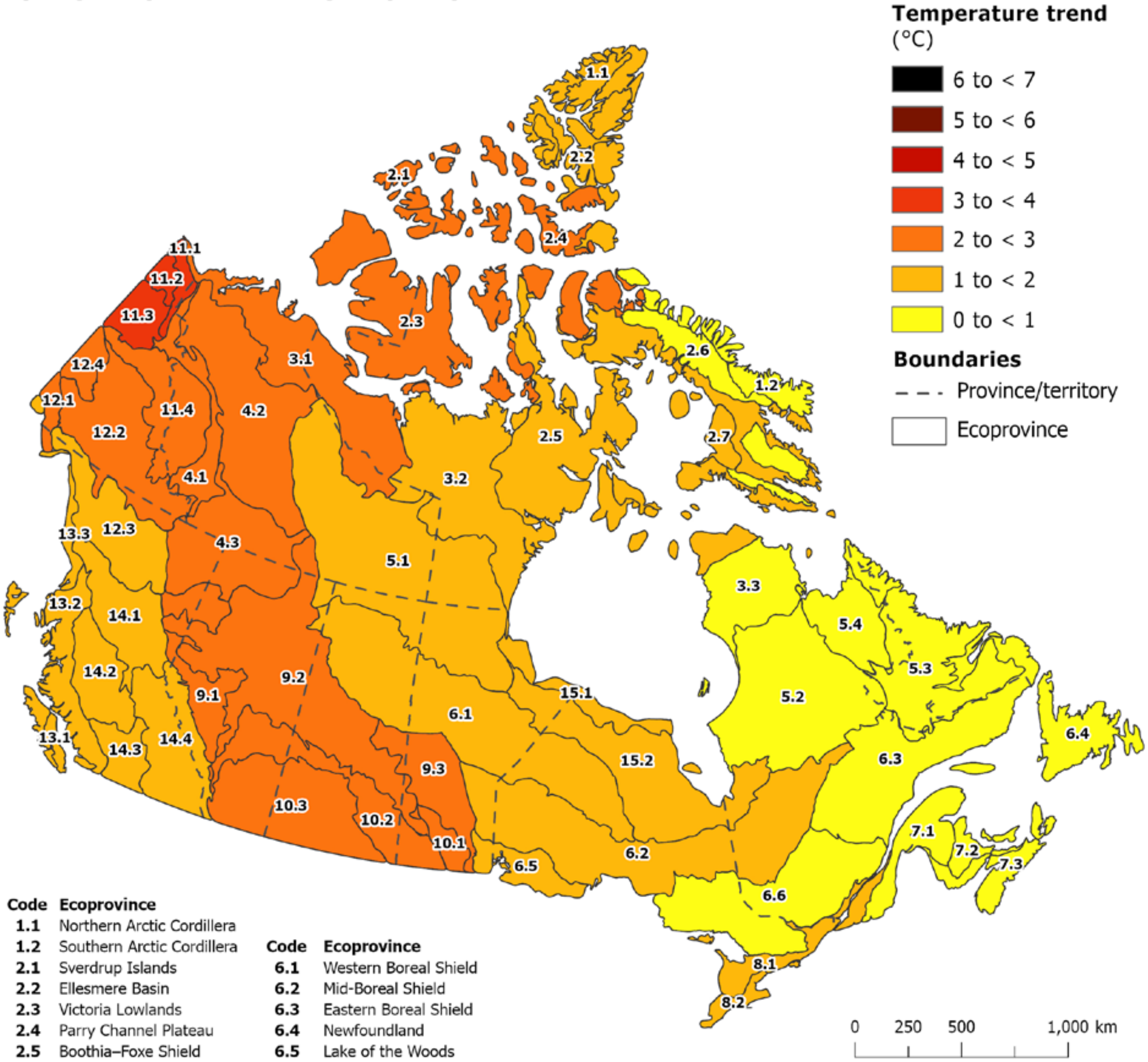


Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Temperature change (1948 to 2016) refers to the linear trend of temperature departures from the 1961 to 1990 climate normal. Caution should be exercised when analyzing change results in the North because of lower climate station densities. Significance levels are not available.

Sources: Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD)*; ECCC, *Climate Trends and Variations Bulletin.*

Spring temperature change, by ecoprovince, 1948 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

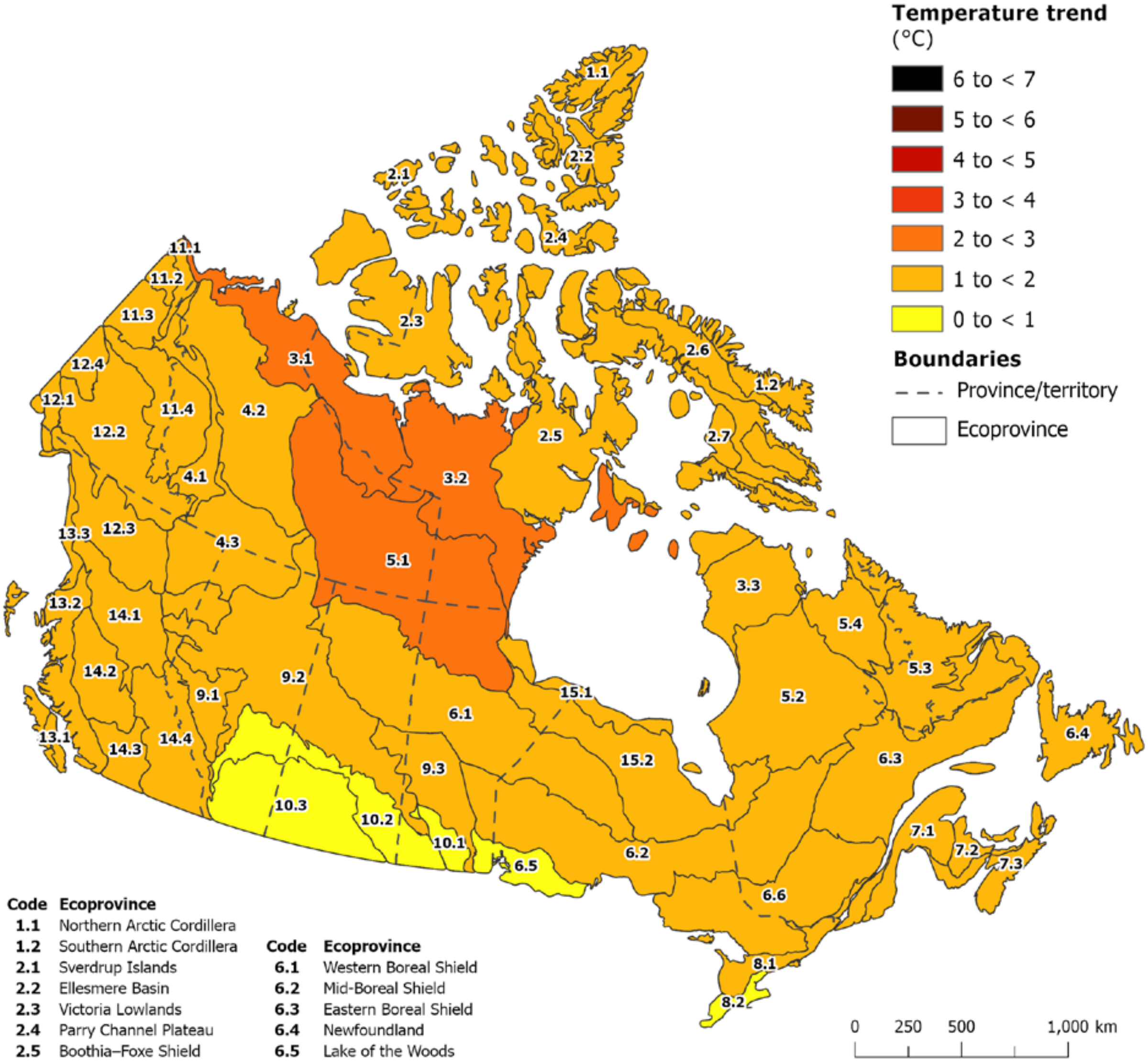
Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Temperature change (1948 to 2016) refers to the linear trend of temperature departures from the 1961 to 1990 climate normal. Caution should be exercised when analyzing change results in the North because of lower climate station densities. Significance levels are not available. Spring data are from March to May.
Sources: Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD)*; ECCC, *Climate Trends and Variations Bulletin.*

Summer temperature change, by ecoprovince, 1948 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

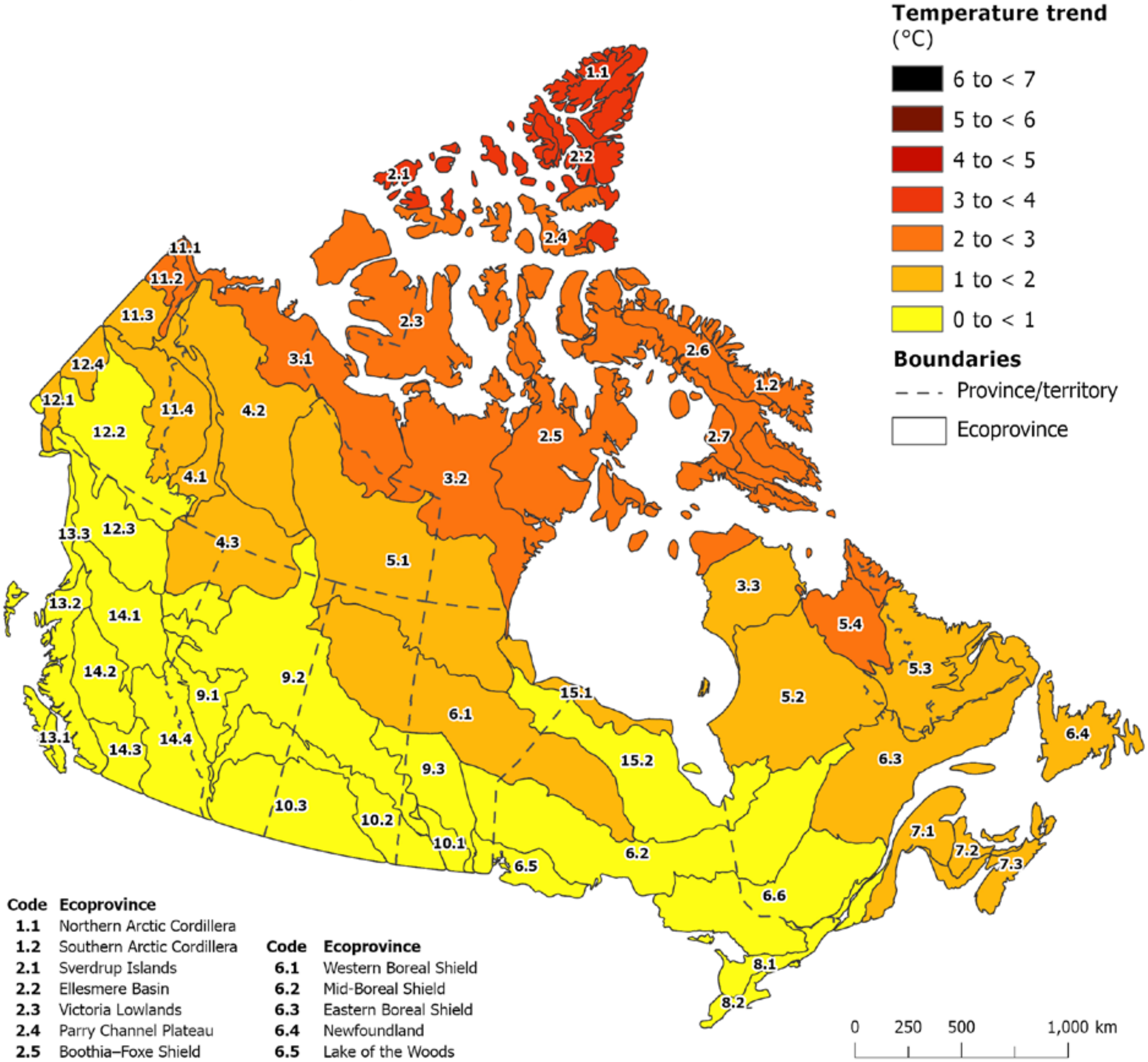
Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Temperature change (1948 to 2016) refers to the linear trend of temperature departures from the 1961 to 1990 climate normal. Caution should be exercised when analyzing change results in the North because of lower climate station densities. Significance levels are not available. Summer data are from June to August.
Sources: Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD)*; ECCC, *Climate Trends and Variations Bulletin.*

Fall temperature change, by ecoprovince, 1948 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
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6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
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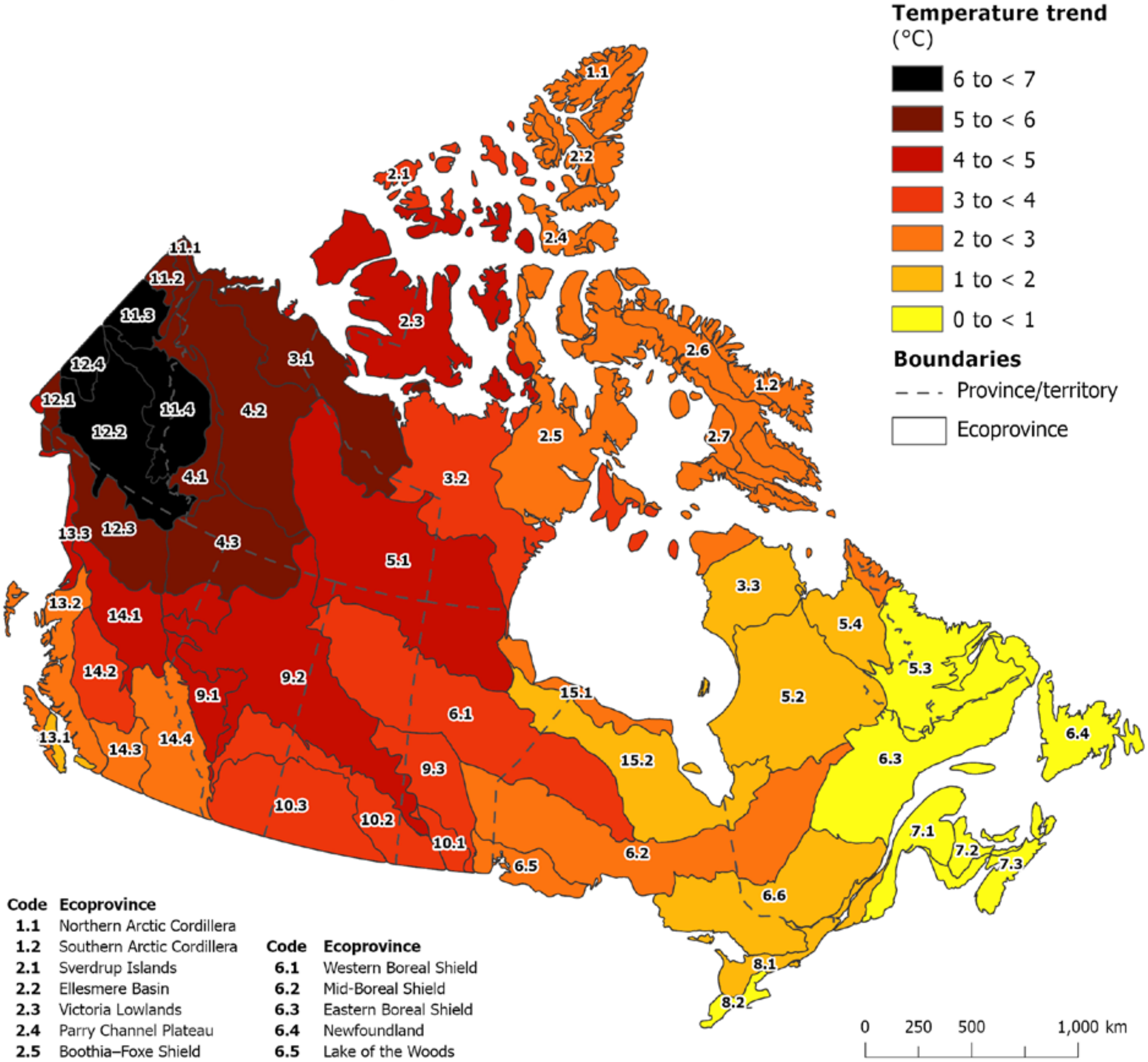
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Temperature change (1948 to 2016) refers to the linear trend of temperature departures from the 1961 to 1990 climate normal. Caution should be exercised when analyzing change results in the North because of lower climate station densities. Significance levels are not available. Fall data are from September to November.
Sources: Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD)*; ECCC, *Climate Trends and Variations Bulletin*.

Winter temperature change, by ecoprovince, 1948 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

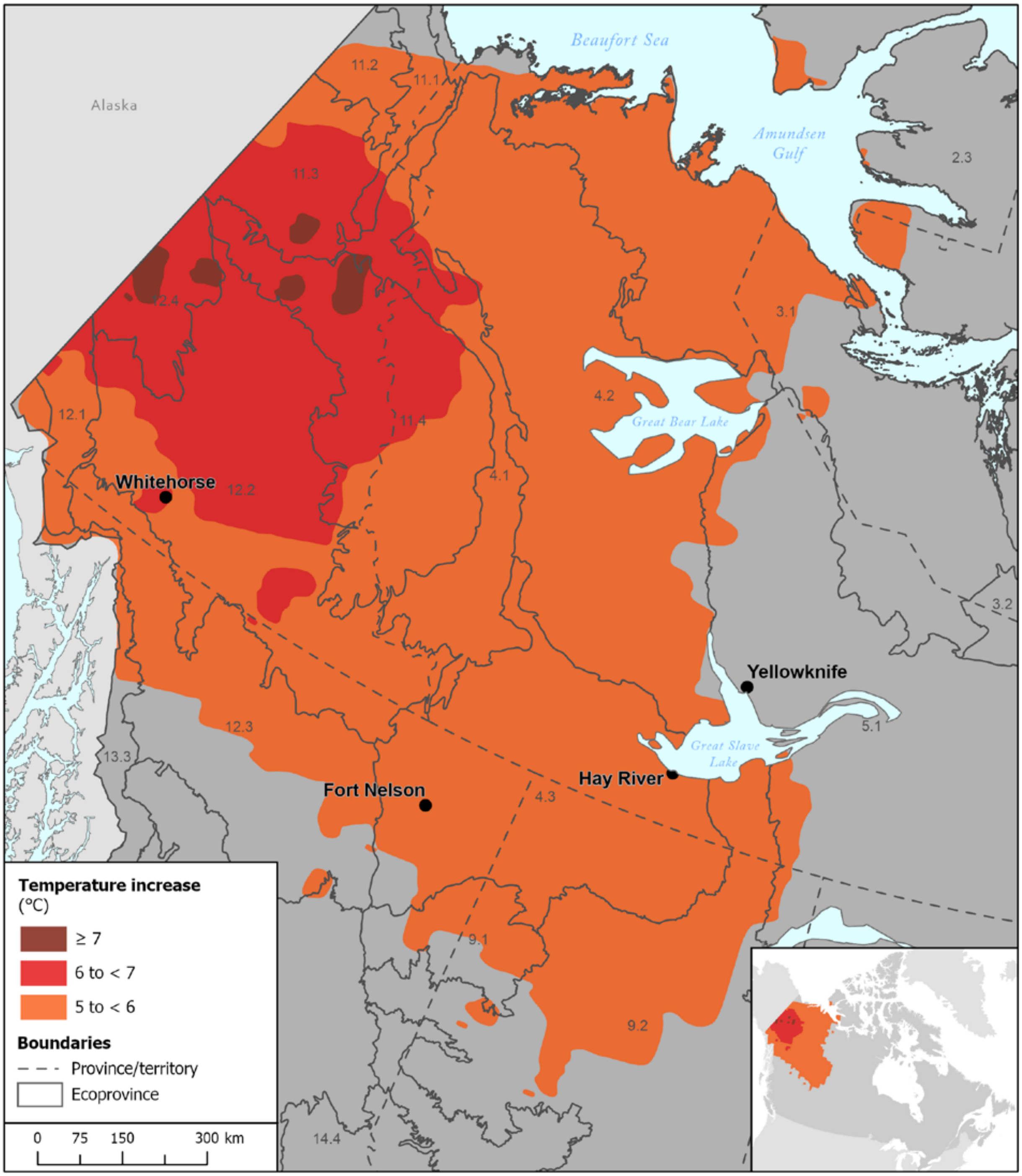
Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

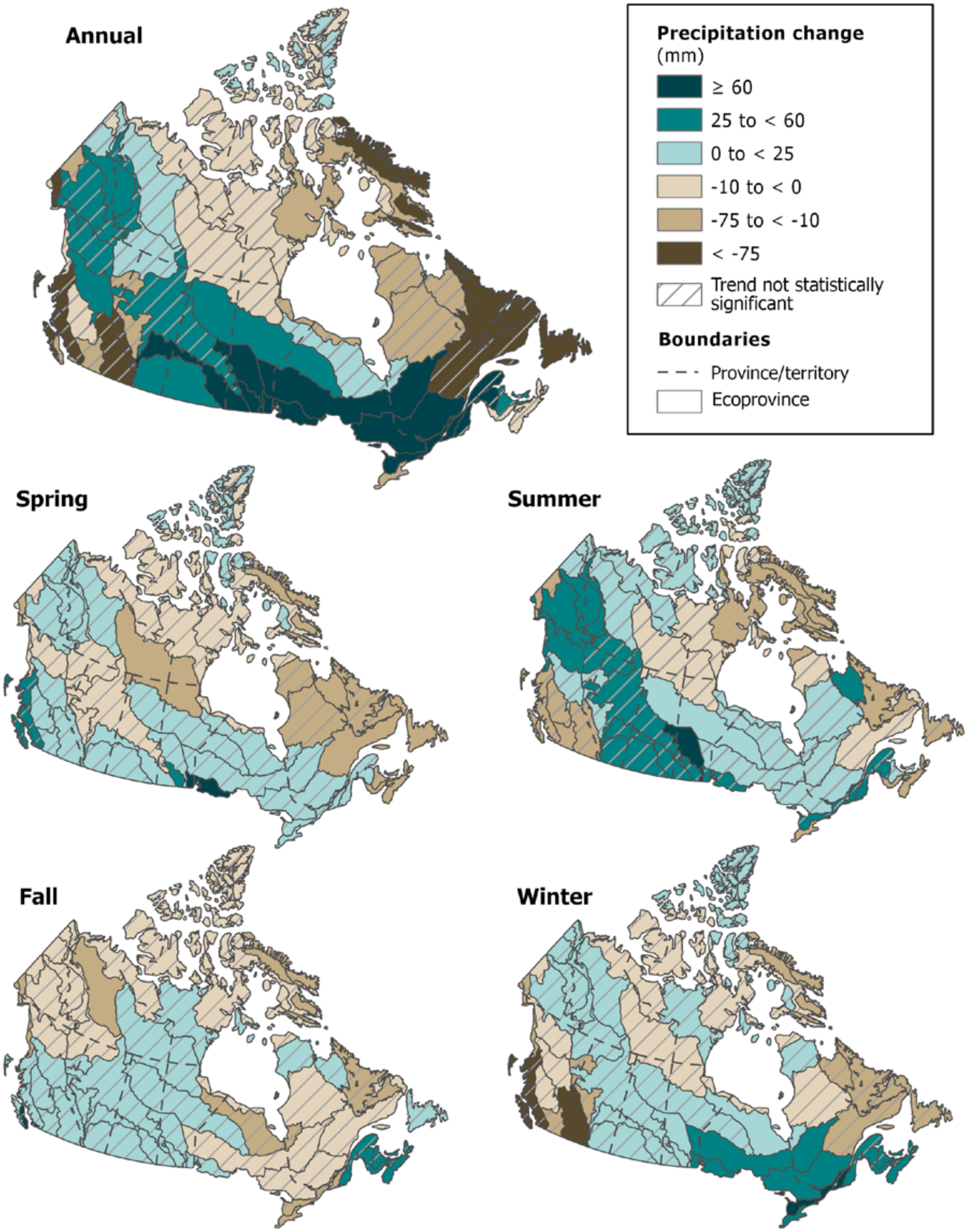
Notes: Temperature change (1948 to 2016) refers to the linear trend of temperature departures from the 1961 to 1990 climate normal. Caution should be exercised when analyzing change results in the North because of lower climate station densities. Significance levels are not available. Winter data are from December to February.
Sources: Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD)*; ECCC, *Climate Trends and Variations Bulletin.*

Winter temperature increase greater than 5°C, northwestern Canada, 1948 to 2016



Notes: Temperature change (1948 to 2016) refers to the linear trend of temperature departures from the 1961 to 1990 climate normal. Caution should be exercised when analyzing change results in the North because of lower climate station densities. Significance levels are not available. Winter data are from December to February.
Sources: Environment and Climate Change Canada (ECCC), *Canadian Gridded Temperature and Precipitation Anomalies (CANGRD)*; ECCC, *Climate Trends and Variations Bulletin.*

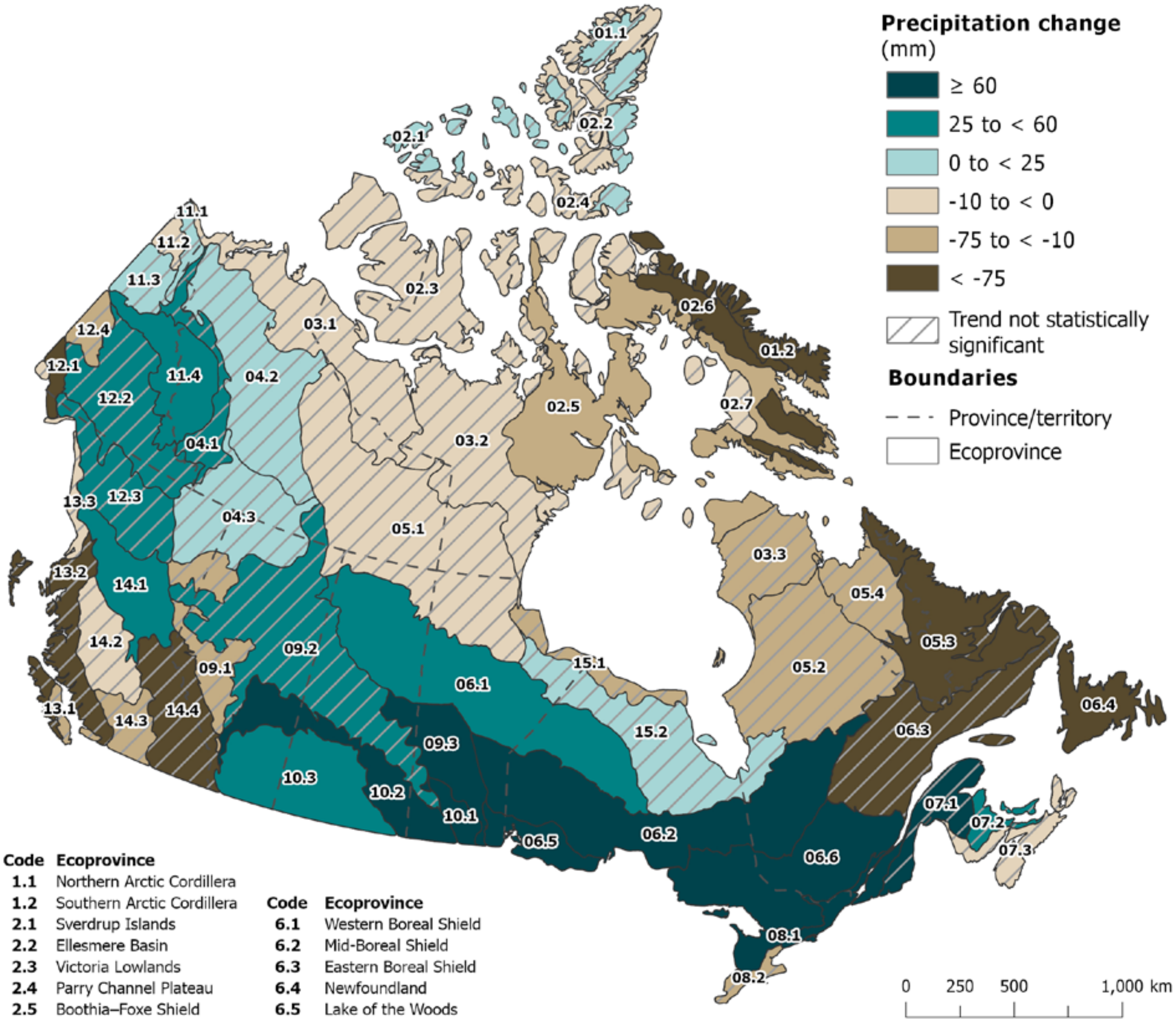
Precipitation change, annual and all seasons, by ecoprovince, 1979 to 2016



Notes: Statistically significant linear trends are presented at the 90% confidence interval or above. Caution should be used when analyzing trends in the North because of lower climate station densities. Winter data are from December to February with other seasons following sequentially.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres,* Vol. 119, pp. 8712–8725.

Annual precipitation change, by ecoprovince, 1979 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

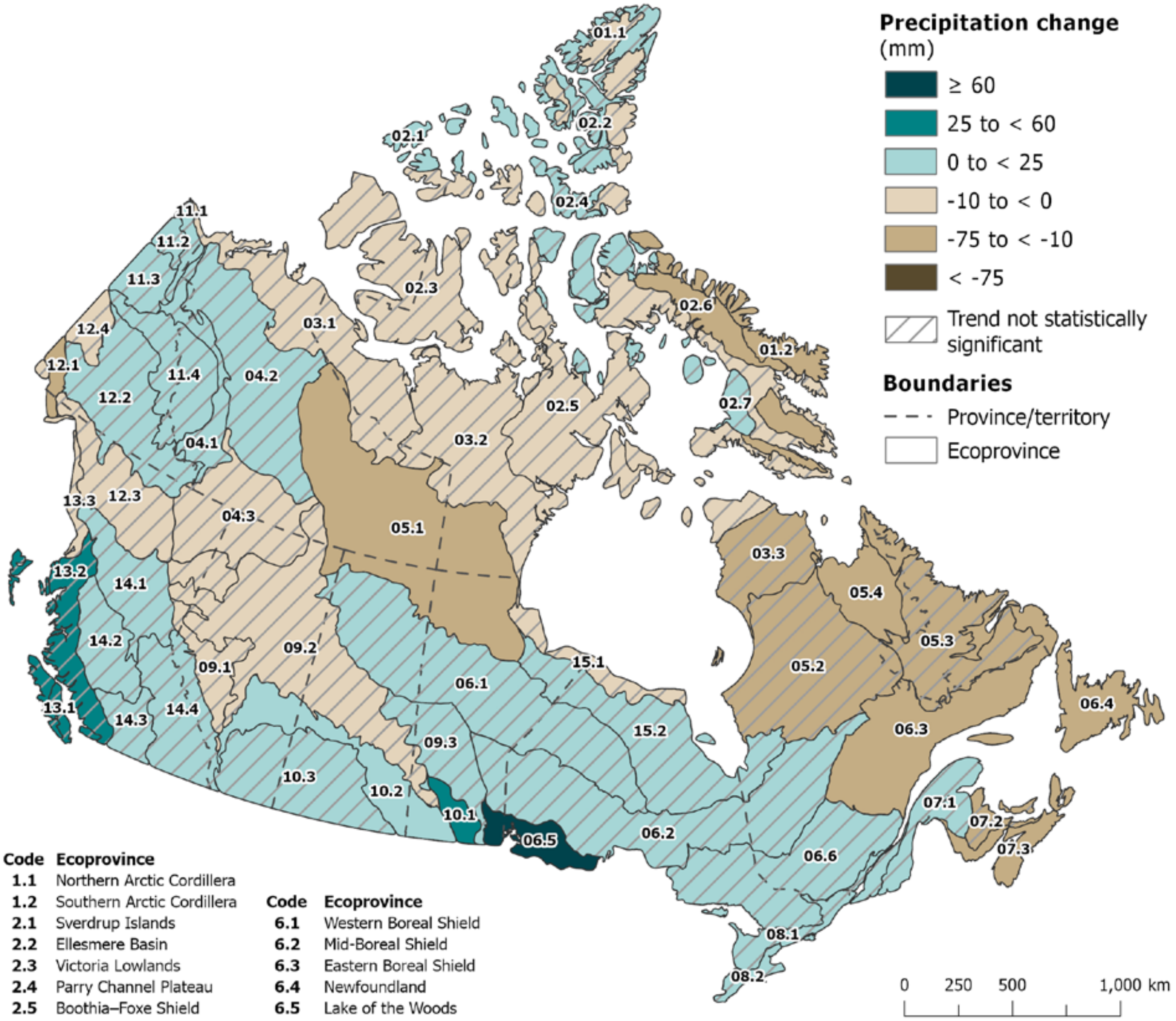
Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Statistically significant linear trends are presented at the 90% confidence interval or above. Caution should be used when analyzing trends in the North because of lower climate station densities.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres,* Vol. 119, pp. 8712–8725.

Spring precipitation change, by ecoprovince, 1979 to 2016

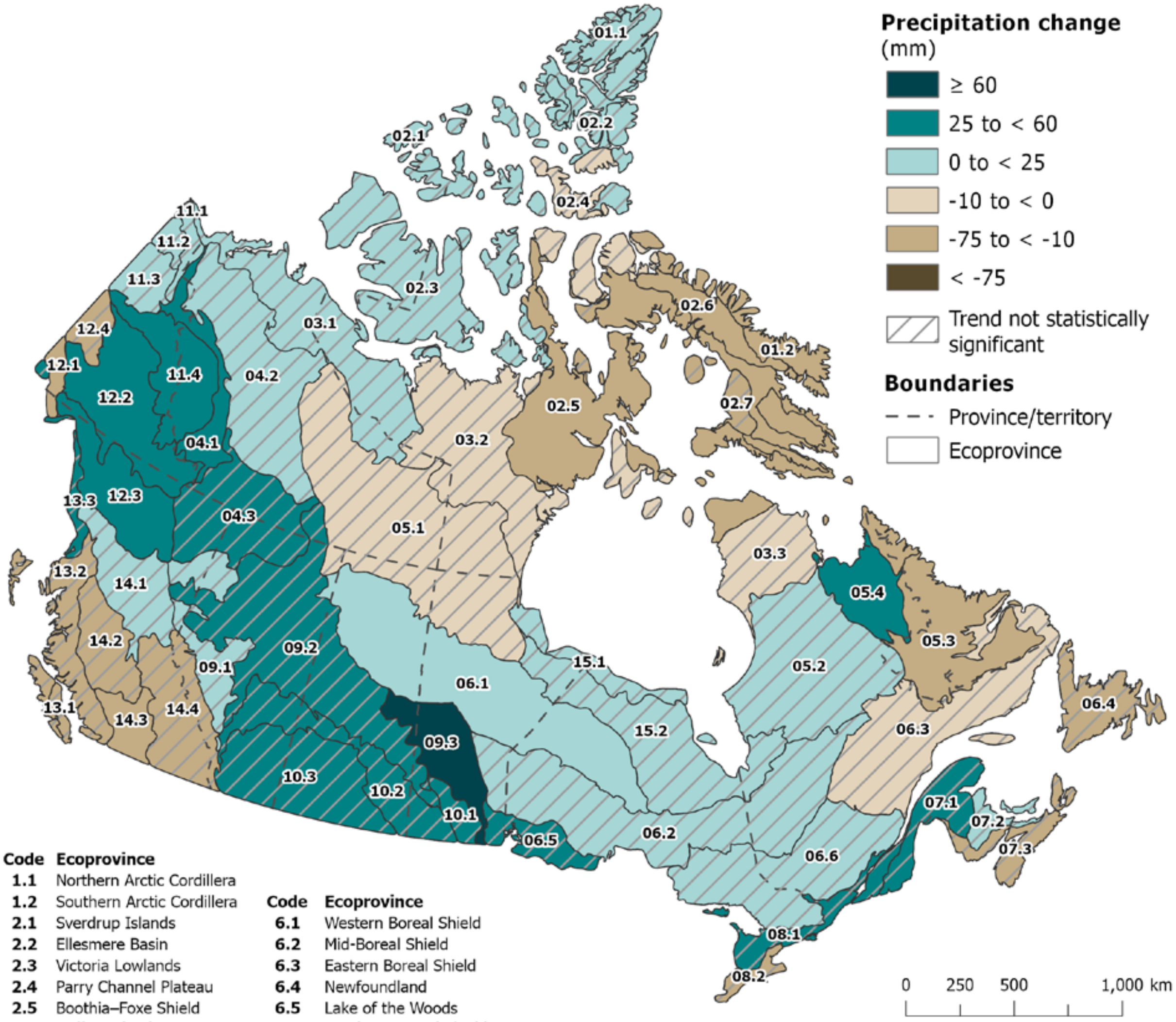


Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Statistically significant linear trends are presented at the 90% confidence interval or above. Caution should be used when analyzing trends in the North because of lower climate station densities. Spring data are from March to May.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres,* Vol. 119, pp. 8712–8725.

Summer precipitation change, by ecoprovince, 1979 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

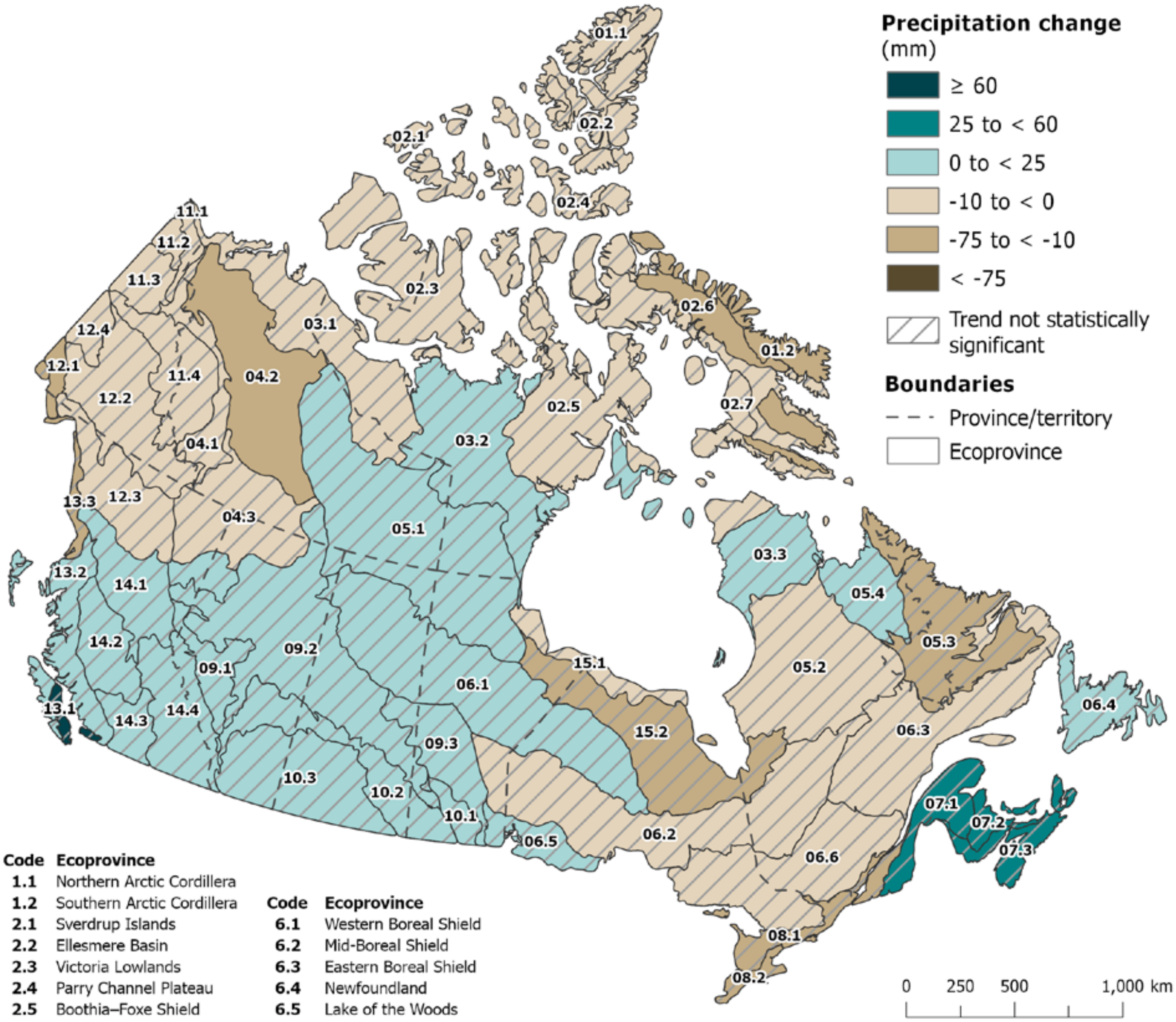
Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Statistically significant linear trends are presented at the 90% confidence interval or above. Caution should be used when analyzing trends in the North because of lower climate station densities. Summer data are from June to August.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences*, Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres*, Vol. 119, pp. 8712–8725.

Fall precipitation change, by ecoprovince, 1979 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

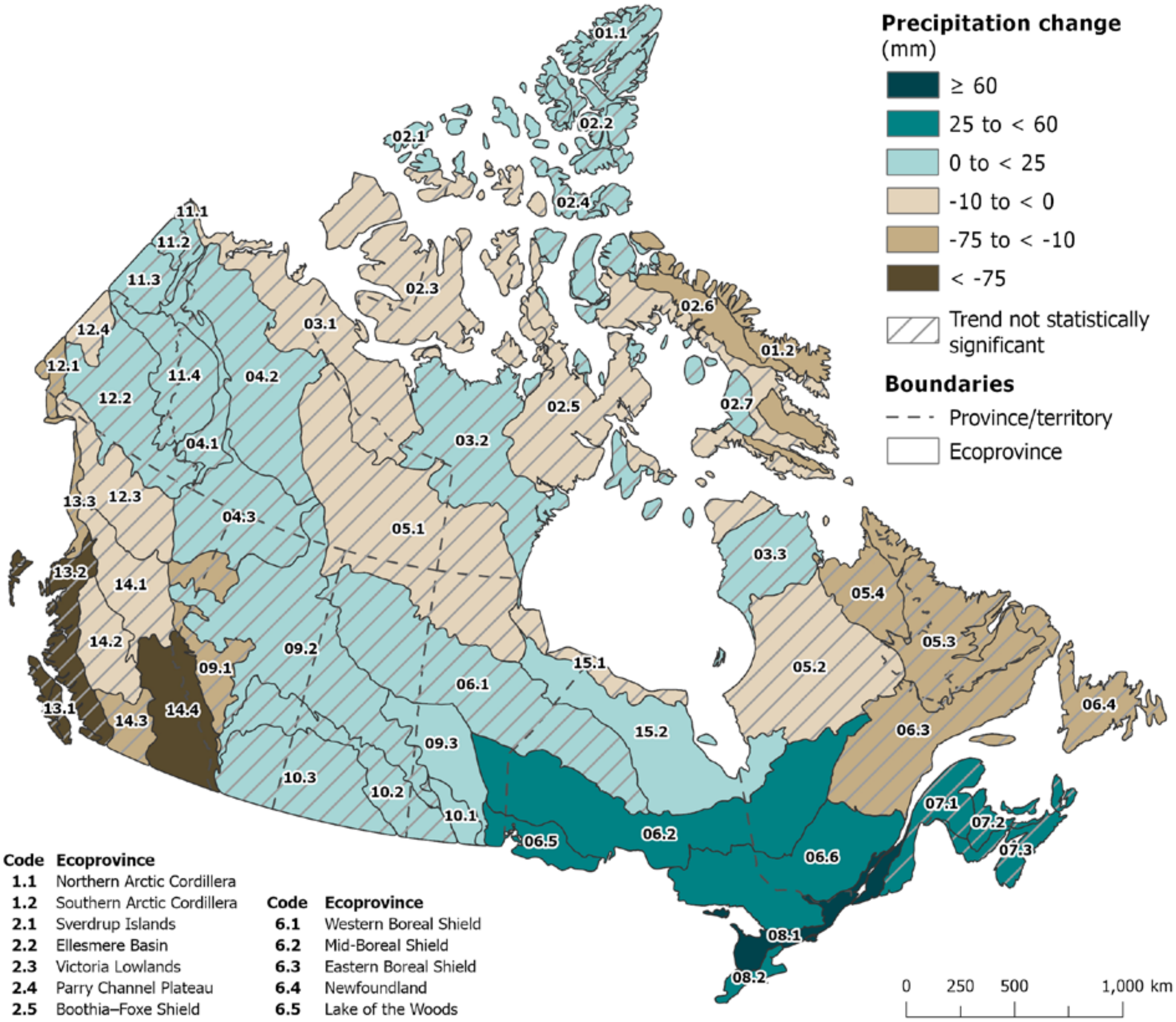
Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Statistically significant linear trends are presented at the 90% confidence interval or above. Caution should be used when analyzing trends in the North because of lower climate station densities. Fall data are from September to November.
Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres,* Vol. 119, pp. 8712–8725.

Winter precipitation change, by ecoprovince, 1979 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

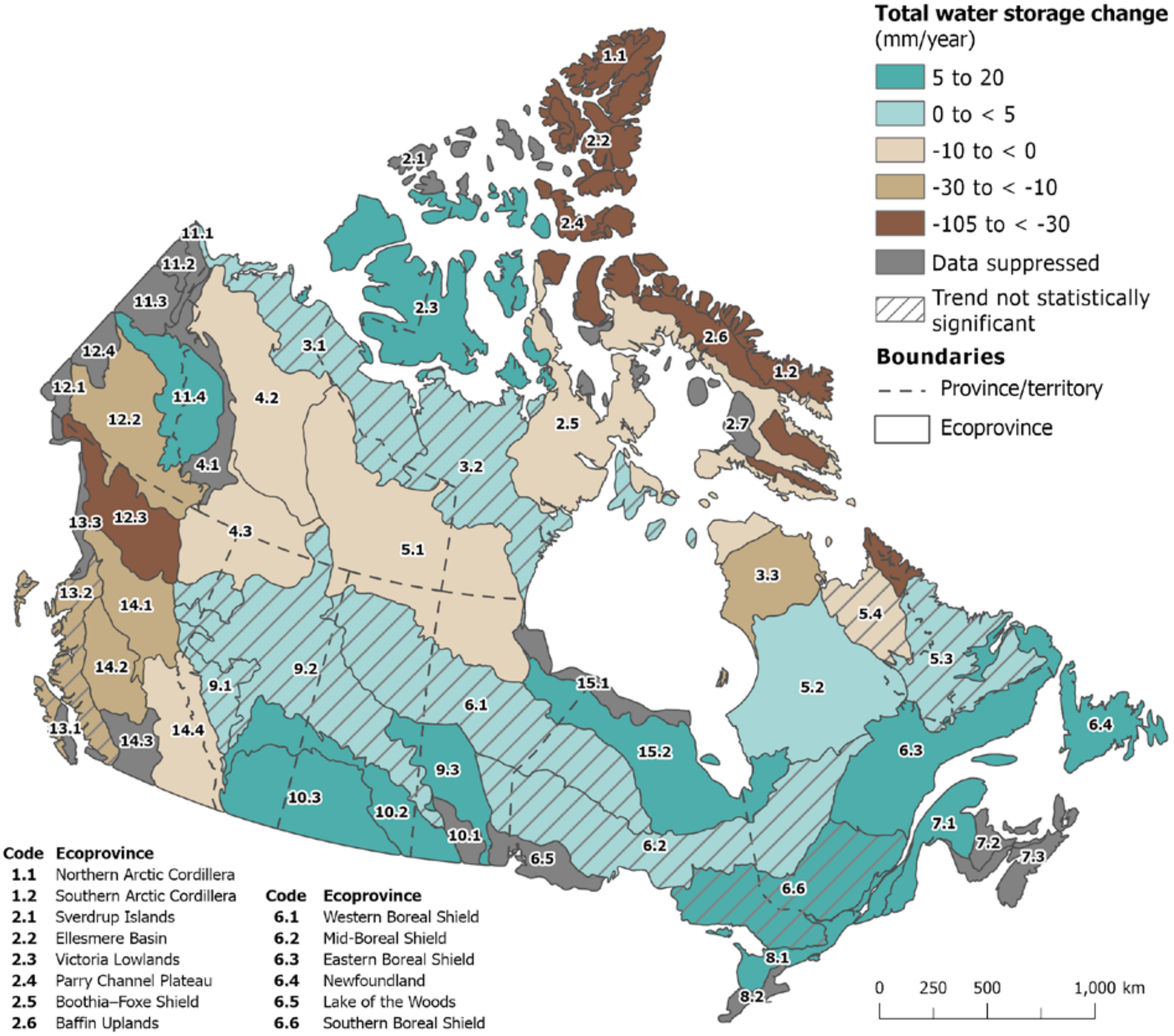
Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Statistically significant linear trends are presented at the 90% confidence interval or above. Caution should be used when analyzing trends in the North because of lower climate station densities. Winter data are from December to February.
Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Wang, S., Y. Yang, Y. Luo and A. Rivera, 2013, "Spatial and seasonal variations in evapotranspiration over Canada's landmass," *Hydrology and Earth System Sciences,* Vol. 17, no. 9, pp. 3561-3575; Wang, S., et al., 2014, "A national-scale assessment of long-term water budget closures for Canada's watersheds," *Journal of Geophysical Research: Atmospheres,* Vol. 119, pp. 8712–8725.

Annual total water storage change, by ecoprovince, 2002 to 2016



Code	Ecoprovince
1.1	Northern Arctic Cordillera
1.2	Southern Arctic Cordillera
2.1	Sverdrup Islands
2.2	Ellesmere Basin
2.3	Victoria Lowlands
2.4	Parry Channel Plateau
2.5	Boothia–Foxe Shield
2.6	Baffin Uplands
2.7	Foxe–Boothia Lowlands
3.1	Amundsen Lowlands
3.2	Keewatin Lowlands
3.3	Ungava–Belcher
4.1	Mackenzie Foothills
4.2	Great Bear Lowlands
4.3	Hay–Slave Lowlands
5.1	Western Taiga Shield
5.2	Eastern Taiga
5.3	Labrador Uplands
5.4	Whale River Lowland

Code	Ecoprovince
6.1	Western Boreal Shield
6.2	Mid-Boreal Shield
6.3	Eastern Boreal Shield
6.4	Newfoundland
6.5	Lake of the Woods
6.6	Southern Boreal Shield
7.1	Appalachian–Acadian Highlands
7.2	Northumberland Lowlands
7.3	Fundy Uplands
8.1	Great Lakes–St. Lawrence
8.2	Huron–Erie Plains
9.1	Boreal Foothills
9.2	Central Boreal Plains
9.3	Eastern Boreal Plains
10.1	Eastern Prairies
10.2	Parkland Prairies
10.3	Central Grassland

Code	Ecoprovince
11.2	Old Crow–Eagle Plains
11.3	Ogilvie Mountains
11.4	Mackenzie–Selwyn Mountains
12.1	Wrangel Mountains
12.2	Northern Boreal Cordillera
12.3	Southern Boreal Cordillera
12.4	Western Boreal Cordillera
13.1	Georgia Depression
13.2	Southern Coastal Mountains

Code	Ecoprovince
13.3	Northern Coastal Mountains
11.1	Northern Yukon Mountains
14.1	Northern Montane Cordillera
14.2	Central Montane Cordillera
14.3	Southern Montane Cordillera
14.4	Columbia Montane Cordillera
15.1	Hudson Bay Coastal Plains
15.2	Hudson–James Lowlands

Notes: Total water storage change is an estimate of the change in water stored in the environment as groundwater, soil moisture, surface water, snow and ice. Caution must be used in interpreting total water storage change results because of the level of uncertainty in the models, the short length of the time series, and the coarse resolution of the data. Data were suppressed for smaller ecoprovinces using a threshold of approximately 90,000 km^2. Statistically significant linear trends are presented at the 90% confidence interval or above.

Sources: Statistics Canada, Environment and Energy Statistics Division, 2021, special tabulation based on Wang, S., et al., 2014, "Assessment of water budget for sixteen large drainage basins in Canada," *Journal of Hydrology*, Vol. 512, pp. 1-15; Wang, S. and J. Li, 2016, "Terrestrial water storage climatology for Canada from GRACE satellite observations in 2002-2014," *Canadian Journal of Remote Sensing*, Vol. 42, no. 3, pp. 190-202; Li, J., S. Wang and F. Zhou, 2016, "Time series analysis of long-term terrestrial water storage over Canada from GRACE satellites using principal component analysis," *Canadian Journal of Remote Sensing*, Vol. 42, no. 3, pp. 161-170.