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*Supplement of*

## **Groundwater nitrate concentration evolution under climate change and agricultural adaptation scenarios: Prince Edward Island, Canada**

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This supplemental material provides:

- Table S1. Classification of nitrate concentrations for each watershed and percentage change compared to 2001 (%/2001) in average nitrate concentration for the entire Prince Edward Island for scenarios 1 to 9. B is for Background, L, M and H stand for Low, Medium and High nitrate concentration class, respectively. Locations of each watershed with associated watershed number are indicated in Figure 1.
- Table S2. Temperature and precipitation changes for the future period (2040–2069) relative to the historical period (1971–2000) for each selected climate change scenarios at the Charlottetown weather station, Prince Edward Island, based on up-to-date climate simulations.

Table S1. Classification of nitrate concentrations for each watershed and percentage change compared to 2001 (%/2001) in average nitrate concentration for the entire Prince Edward Island for scenarios 1 to 9. B is for Background, L, M and H stand for Low, Medium and High nitrate concentration class, respectively. Locations of each watershed with associated watershed number are indicated in Figure 1.

Watershed Name (Number)	Climate						Climate and Agricultural Adaptation			
	2001	Baseline 2050	Climate		Climate and Agricultural Adaptation		Climate		Climate and Agricultural Adaptation	
	Class	Class (%/2001)	CGCM2- A2 Class (%/2001)	CGCM2- B2 Class (%/2001)	HadCM3- A2 Class (%/2001)	HadCM3- B2 Class (%/2001)	CGCM2- A2 Class (%/2001)	CGCM2- B2 Class (%/2001)	HadCM3- A2 Class (%/2001)	HadCM3- B2 Class (%/2001)
Sea Cow Pond (1)	M	M (17)	M (18)	M (18)	M (18)	M (18)	H (33)	H (33)	H (36)	M (23)
Cape Gage (2)	L	M (27)	M (27)	M (27)	M (27)	M (31)	M (45)	M (45)	M (45)	M (45)
Tignish River (3)	M	M (15)	M (15)	M (15)	M (15)	M (19)	M (35)	M (31)	M (35)	M (38)
Little Miminegash River (4)	L	M (19)	M (20)	M (20)	M (20)	M (20)	M (38)	M (38)	M (38)	M (38)
Hills River (5)	M	M (15)	M (15)	M (15)	M (15)	M (15)	H (34)	H (34)	H (34)	M (32)
Whites Cove (6)	L	L (25)	L (24)	L (29)	L (24)	L (24)	M (43)	M (43)	M (43)	L (38)
Mill River (7)	M	M (18)	M (19)	M (19)	M (19)	M (19)	M (37)	M (37)	M (37)	M (37)
Trout River (Roxbury) (8)	M	M (14)	M (15)	M (13)	M (15)	M (13)	M (33)	M (30)	M (33)	M (30)
Little Pierre Jacques River (9)	L	M (23)	M (24)	M (24)	M (24)	M (24)	M (40)	M (40)	M (40)	M (40)
Brae River (10)	M	M (23)	M (22)	M (22)	M (25)	M (28)	M (39)	M (39)	M (42)	M (42)
Enmore River (11)	B	L (11)	L (11)	L (11)	L (11)	L (21)	L (31)	L (31)	L (31)	L (31)
Cranberry Point (12)	B	L (10)	L (16)	L (16)	L (16)	L (16)	L (37)	L (26)	L (37)	L (37)
St. Phillip (13)	B	L (12)	L (14)	L (14)	L (14)	L (14)	L (25)	L (25)	L (25)	L (35)
Browns Creek (14)	L	L (6)	L (23)	L (14)	L (23)	L (19)	M (44)	M (36)	M (44)	M (36)
Little Trout River (15)	L	M (16)	M (31)	M (24)	M (31)	M (24)	M (54)	M (46)	M (54)	M (42)
Haldiman River (16)	L	L (12)	L (12)	L (12)	L (12)	L (12)	L (31)	L (31)	L (31)	L (31)
Sunbury Cove (17)	L	L (26)	M (44)	M (35)	M (44)	M (35)	M (62)	M (53)	M (62)	M (53)
Rainers Creek (18)	H	H (21)	H (40)	H (31)	H (40)	H (33)	H (59)	H (50)	H (59)	H (50)
Baltic River (19)	M	H (21)	H (39)	H (31)	H (39)	H (24)	H (57)	H (49)	H (57)	H (41)
Mackies Pond (20)	M	H (20)	H (37)	H (29)	H (37)	H (31)	H (55)	H (47)	H (55)	H (45)
Grahams Crek (21)	L	L (1)	L (14)	M (8)	M (14)	M (11)	M (25)	M (18)	M (25)	M (21)
Schurman's Point (22)	H	H (22)	H (39)	H (31)	H (41)	H (41)	H (59)	H (49)	H (59)	H (47)
Dunk River (23)	M	H (35)	H (55)	H (46)	H (55)	H (46)	H (76)	H (65)	H (74)	H (63)
Prevost Cove (24)	M	H (29)	H (45)	H (38)	H (47)	H (29)	H (65)	H (56)	H (65)	H (45)
McPhee Creek (25)	M	M (-18)	M (-16)	M (-18)	M (-16)	M (-16)	M (-9)	M (-13)	M (-9)	M (-11)
Hunter River (26)	M	M (1)	M (5)	M (-1)	M (5)	M (5)	M (15)	M (8)	M (15)	M (15)
Cymbria (27)	M	M (4)	M (3)	M (-6)	M (3)	M (3)	M (12)	M (3)	M (12)	M (12)
North River (28)	M	M (10)	M (8)	M (2)	M (8)	M (8)	M (18)	M (10)	M (18)	M (15)
Hyde Creek (29)	M	M (1)	M (2)	M (-5)	M (2)	M (2)	H (10)	M (2)	H (10)	H (8)
Long Creek (30)	H	M (-30)	M (-31)	M (-33)	M (-29)	M (-24)	M (-23)	M (-28)	M (-23)	M (-21)
Winter River (31)	M	M (15)	M (12)	M (2)	M (12)	M (12)	M (24)	M (15)	M (24)	M (24)
Appletree Creek (32)	L	L (16)	L (13)	L (1)	L (13)	L (13)	M (30)	L (18)	M (26)	M (26)

Feehans Shore (33)	L	L (15)	L (7)	L (-7)	L (7)	L (13)	L (20)	L (7)	L (20)	L (27)
St.Peters Harbour (34)	L	L (11)	L (7)	L (-4)	L (7)	L (7)	L (24)	L (7)	L (18)	L (24)
Morell River (35)	L	L (10)	L (13)	L (3)	L (13)	L (13)	L (24)	L (8)	L (24)	L (29)
Orwell Cove (36)	L	L (12)	L (8)	L (0)	L (8)	L (12)	M (24)	L (12)	M (24)	M (24)
Little Sands Shore (37)	L	L (-6)	L (-4)	L (-13)	L (-4)	L (-4)	L (5)	L (-4)	L (5)	L (5)
Nicolle Point (38)	L	L (-15)	L (-11)	L (-16)	L (-11)	L (-7)	L (-3)	L (-11)	L (-3)	L (1)
Albion (39)	L	L (8)	L (9)	L (-2)	L (9)	L (15)	L (21)	L (9)	L (21)	L (26)
Montague-Valleyfield (40)	L	L (-20)	L (-15)	L (-22)	L (-15)	L (-12)	L (-9)	L (-19)	L (-9)	L (-5)
Brudenell River (41)	L	L (9)	L (9)	L (3)	L (9)	L (14)	L (19)	L (9)	L (25)	L (30)
Narrows Creek (42)	L	L (12)	L (23)	L (9)	L (23)	L (14)	M (36)	L (23)	M (36)	L (27)
Marie River (43)	L	L (5)	L (7)	L (1)	L (7)	L (12)	L (18)	L (7)	L (18)	L (24)
Poplar Point (44)	L	L (7)	L (8)	L (-3)	L (8)	L (13)	L (24)	L (8)	L (24)	L (24)
Shipwreck Point (45)	L	L (13)	L (14)	L (4)	L (14)	L (20)	L (30)	L (14)	L (30)	L (35)
St.Margarets Shore (46)	L	L (14)	L (13)	L (3)	L (13)	L (18)	L (28)	L (13)	L (28)	L (33)
Surveyor Point (47)	L	L (15)	L (13)	L (2)	L (13)	L (19)	L (29)	L (13)	L (29)	L (35)
MacKinnon Point (48)	L	L (18)	L (19)	L (9)	L (19)	L (19)	L (36)	L (19)	L (36)	L (30)
Bradshaw River (49)	H	H (21)	H (38)	H (31)	H (38)	H (23)	H (57)	H (57)	H (58)	H (40)
Victoria (50)	M	H (7)	H (23)	H (15)	H (23)	H (17)	H (40)	H (31)	H (40)	H (29)
%/2001 Average Concentration over PEI	-	11	17	11	17	15	32	25	32	29

Table S2. Temperature and precipitation changes for the future period (2040–2069) relative to the historical period (1971–2000) for each selected climate change scenarios at the Charlottetown weather station, Prince Edward Island, based on up-to-date climate simulations.

Scenario	Temperature change				Precipitation change			
	Monthly Mean Maximum (°C)		Monthly Mean Minimum (°C)		Monthly Total (%)		Days with Precipitation (%)	
	Jan.	July	Jan.	July	Jan.	July	Jan.	July
CanESM2-RCP8.5	3.7	4.9	4.4	4.6	3.5	21.1	-7.8	-3.7
CanESM2-RCP4.5	3.3	3.6	4.2	3.5	1.1	29.5	-8.3	0.8
HadGEM2-RCP8.5	4.0	5.1	5.5	5.1	15.5	22.7	-5.3	-19.7
HadGEM2-RCP4.5	3.7	3.5	4.8	3.6	8.8	21.0	-4.6	-3.0