

Tools for Emergency Response from the Water Resources Management Division

***Amir Ali Khan
Paul Neary***

Underlying Philosophy

Timely access to and presentation
of
accurate information
in
its proper context and in a visual format
is
critical for effective Emergency Response

Geomatics is the science and technology of gathering,
analyzing, interpreting, distributing and using
geographic information.

Presentation Overview

- ◆ **Focus 1 – Timely Access**
- ◆ **Focus 2 – Accurate Information**
- ◆ **Focus 3 – Proper Context And In A Visual Format**

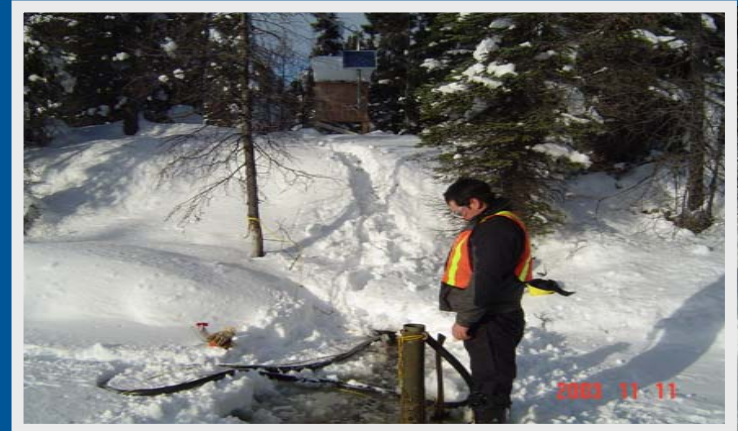
Focus 1

Timely Access

**“Knowing what's happening
in real time”**

**Early warning is critical for effective
Emergency Response**

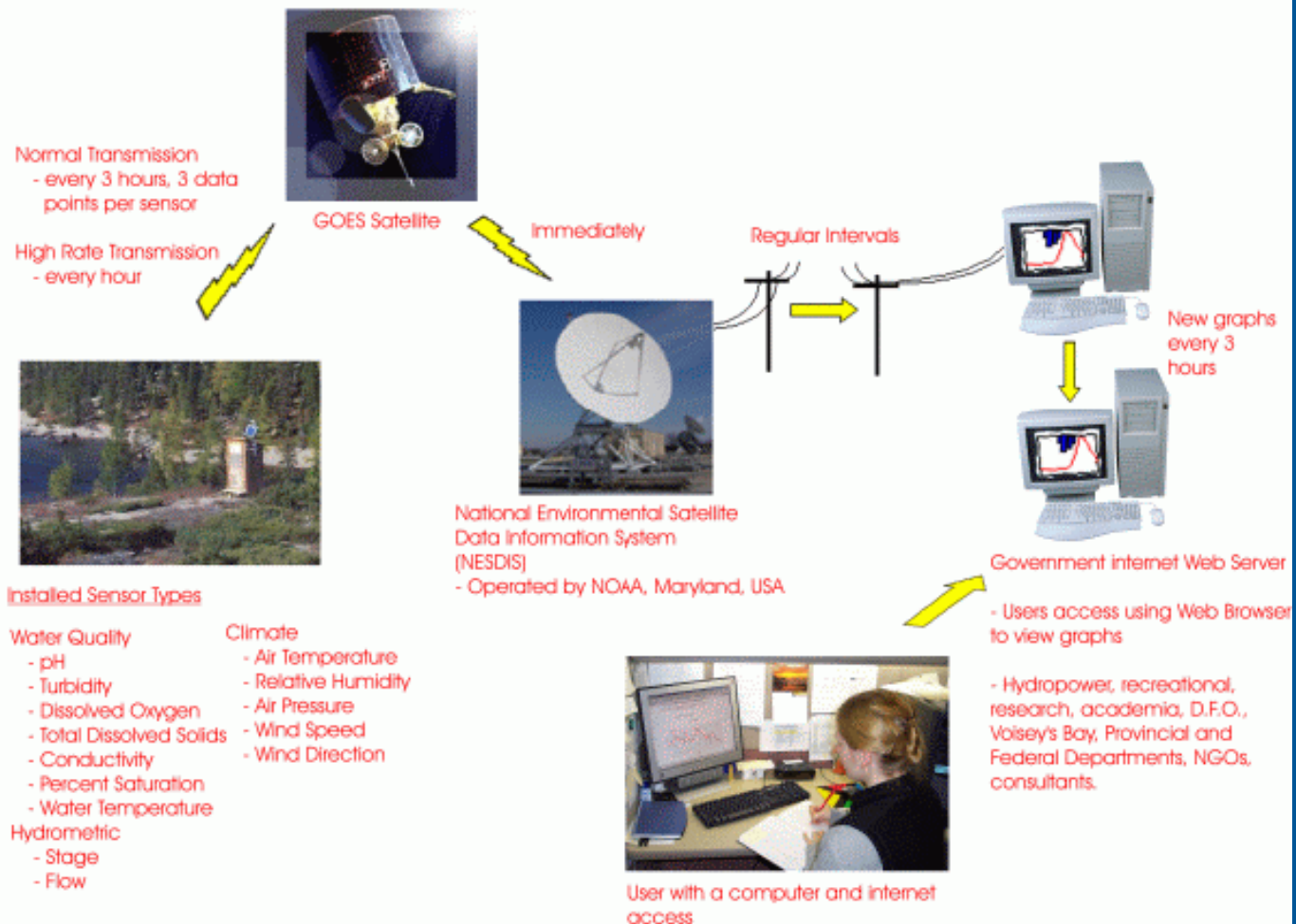
Real-Time Water Quality Monitoring for Water Supplies



Real-Time Data Reporting



Department of Environment and Conservation: Automatic Data Retrieval System



Instrumentation

Numerous parameters available:

Temperature

pH

Turbidity

Depth

Chloride

Ambient Light

Barometric Pressure

Ammonia

Nitrate

Redox

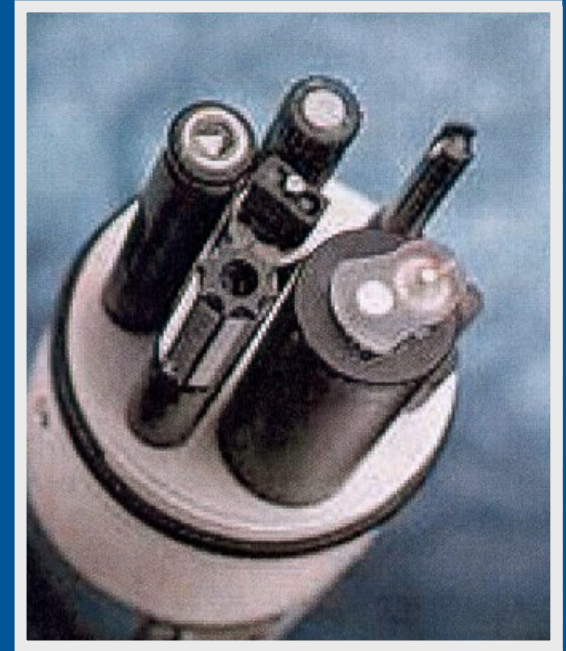
Salinity

Chlorophyll

Specific Conductance

Dissolved Oxygen

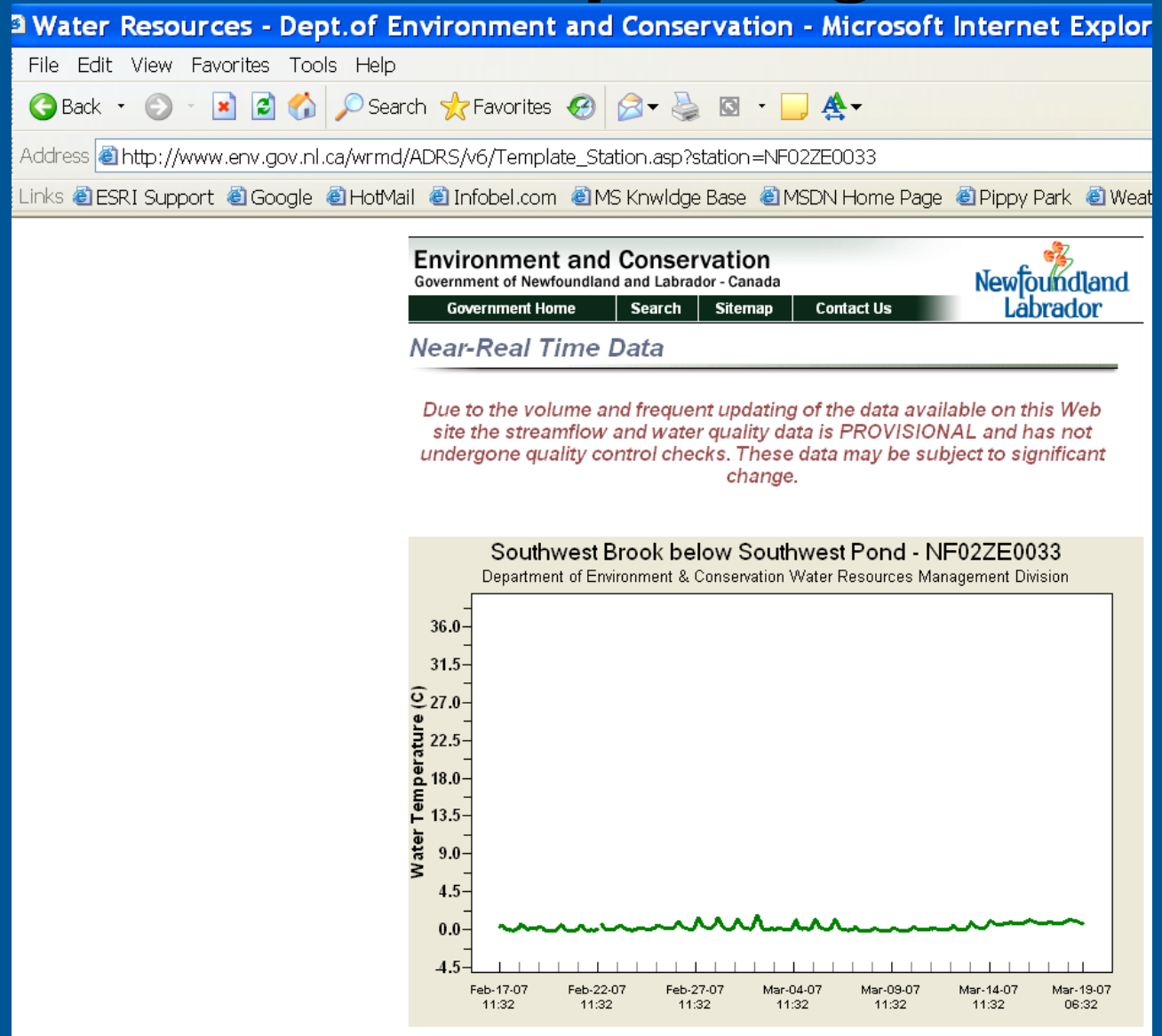
Total Dissolved Gas



Real-Time Data Reporting

NF02ZE0033 -
Southwest
Brook below
Southwest
Pond

(Miawapukek
First Nation
Pilot Project)



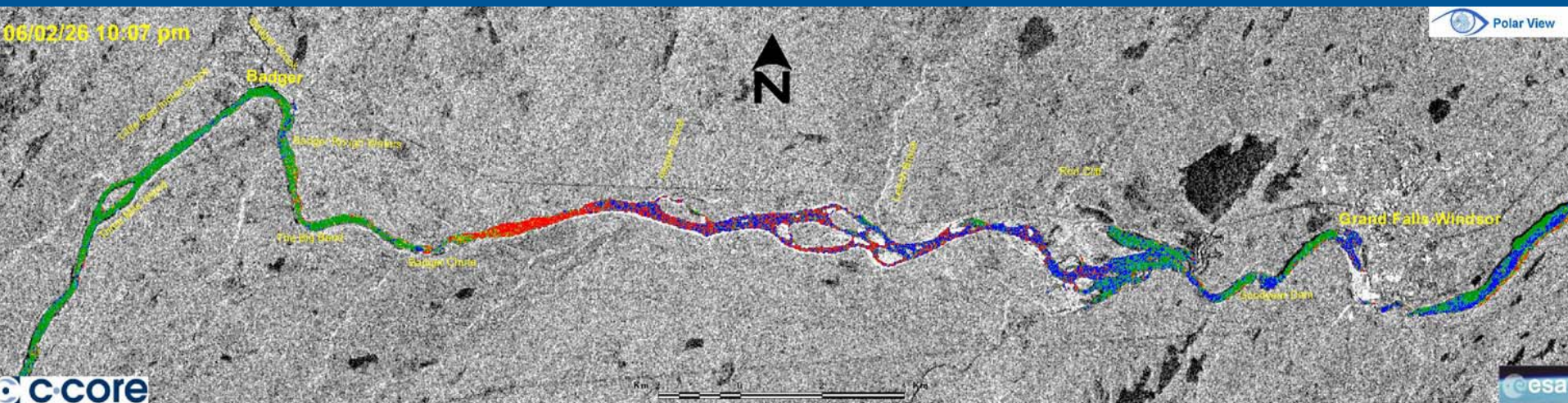
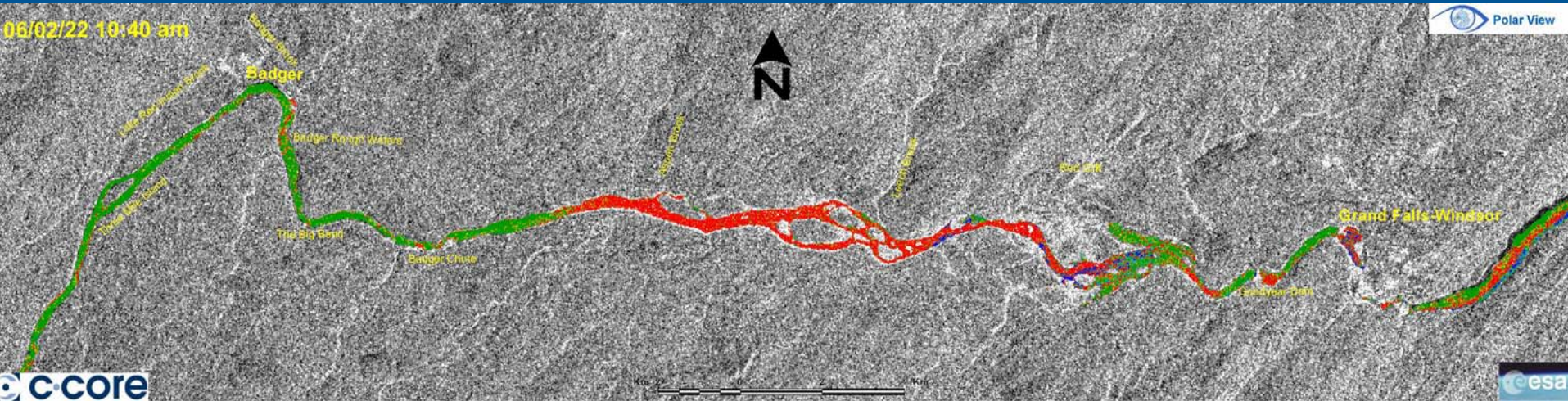
http://www.env.gov.nl.ca/wrmd/ADRS/v6/Template_Station.asp?station=NF02ZE0033

SCADA

- ◆ Supervisory Control And Data Acquisition (SCADA)

SCADA systems are used to monitor or to control chemical or transport processes, in municipal water supply systems.

Remote Sensing For Flood Forecasting and Response



Focus 2

Accurate Information

**“Knowing what is out there
and its exact location”**

**Accurate information is critical for
effective Emergency Response**

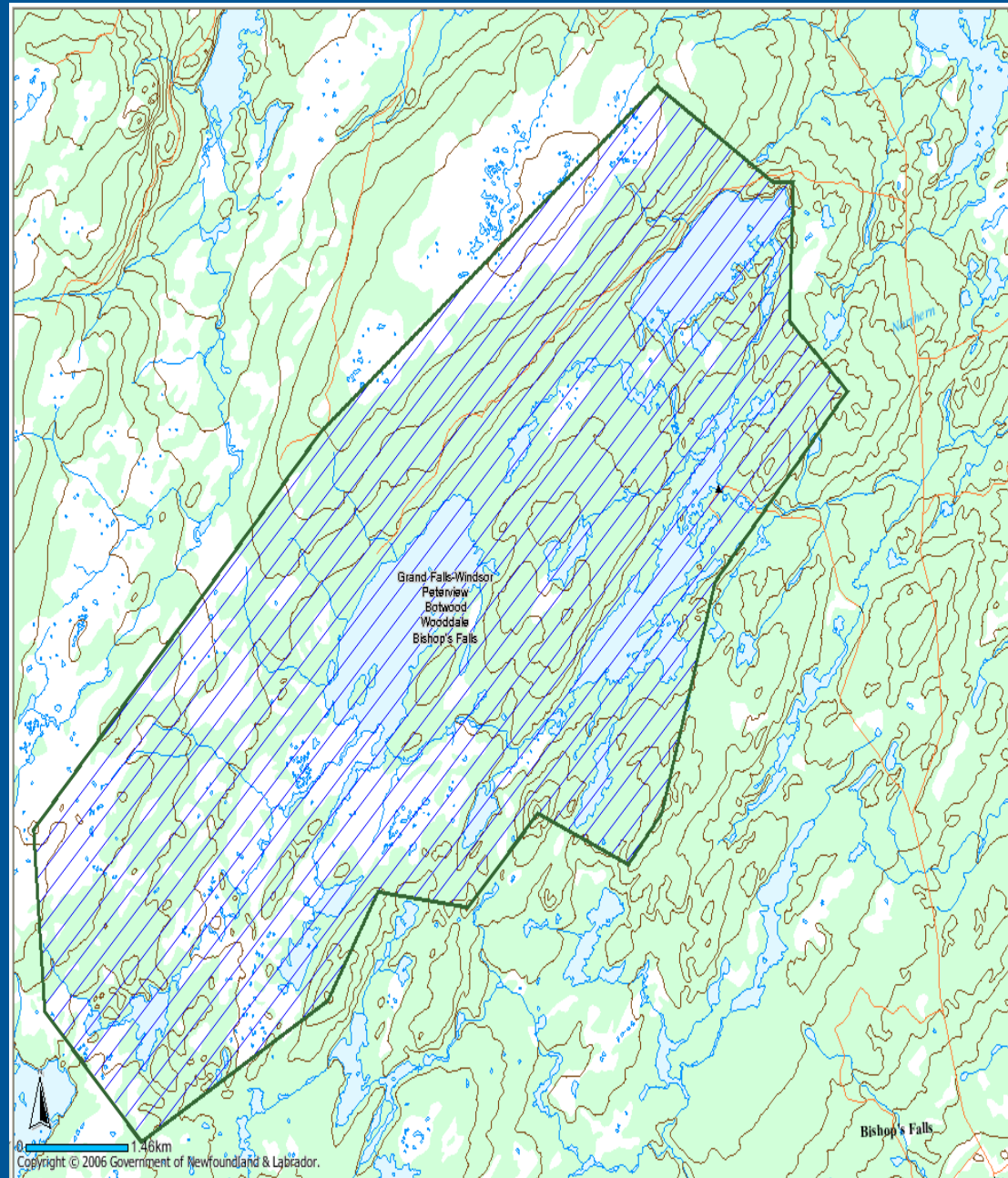
Focus 2

- ◆ Drinking Water Supply Watersheds
- ◆ Drinking Water Supply Systems
- ◆ Flood Risk Mapping
- ◆ Dam Safety

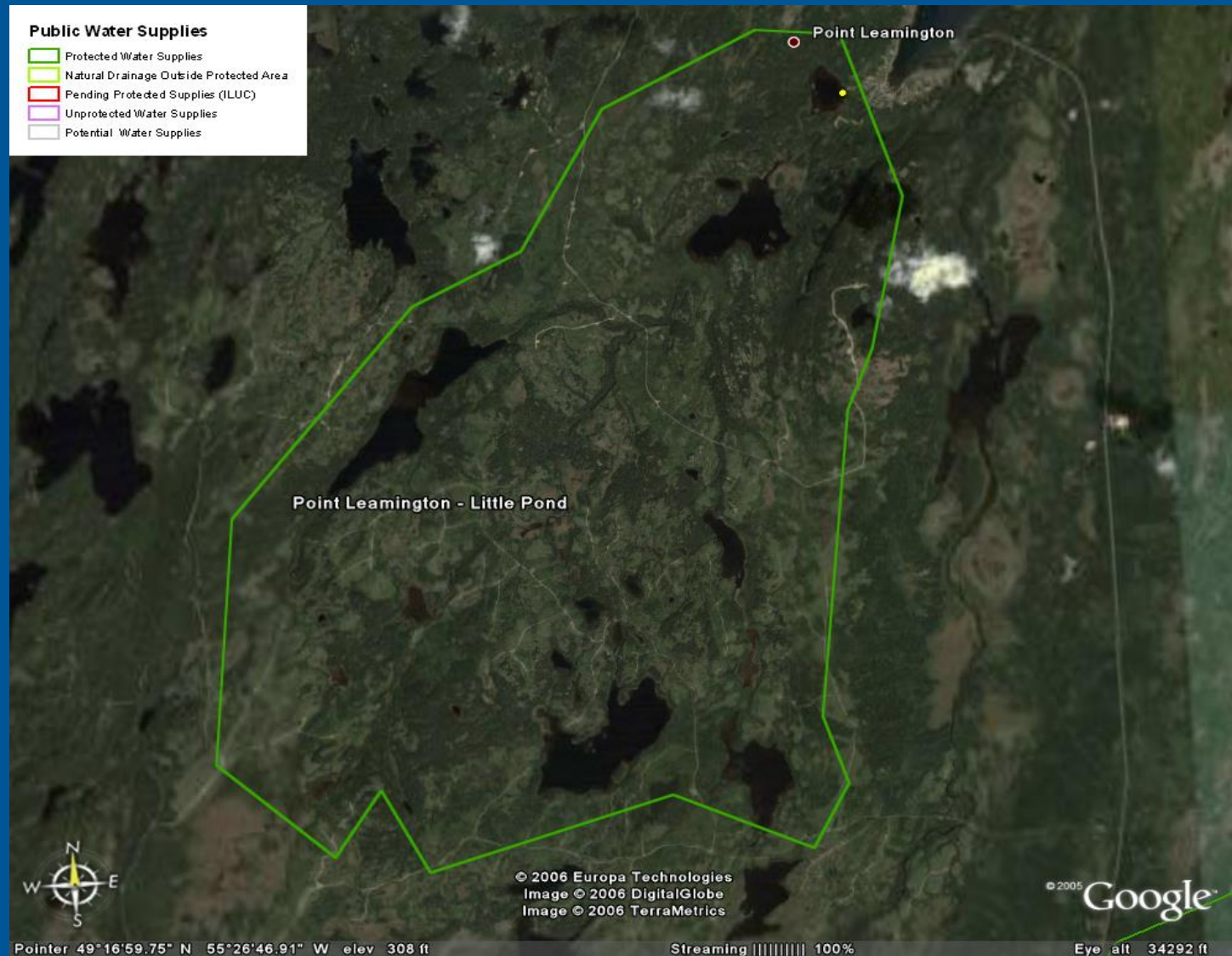
Drinking Water Supply Watershed Maps

The Department has digital boundaries for all public water supplies:

- Protected
- Unprotected
- Potential
- ILUC



Boundaries are available in several formats including Google Earth



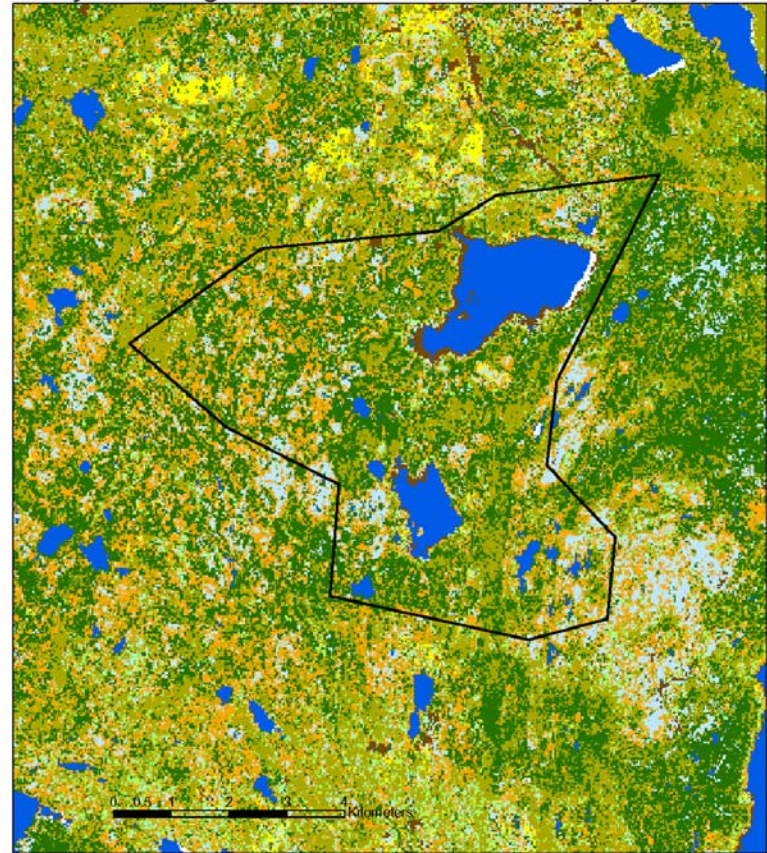
<http://www.env.gov.nl.ca/Env/env/waterres/GIS/Google/PublicWaterSupplies.kmz>

Remote Sensing For Land Cover Analysis

Remote sensing allows the collection of large amounts of data over a wide area.

Land cover classification based on Landsat satellite imagery in 2000 with a spatial resolution of approximately 30 metres.

Bay Bulls Big Pond Protected Water Supply Area



Legend

Unclassified	Shrubs	Coniferous Forest
Water	Wetlands	Deciduous Forest
Non-Vegetated	Grasslands	Mixedwood Forest
Bryoids		

Advanced Products

Slope Analysis

+

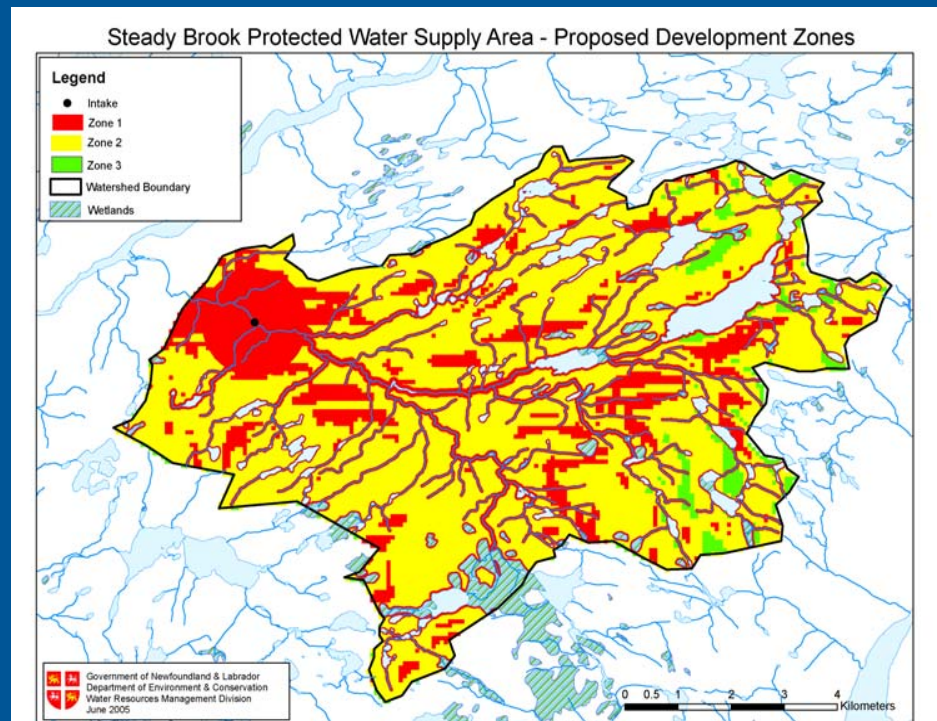
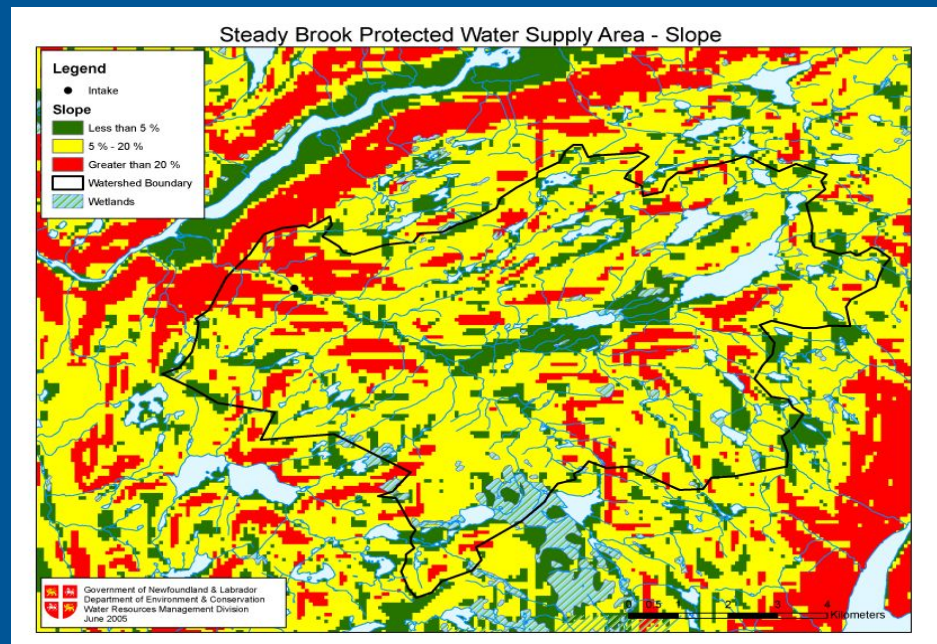
Buffers

+

Land Cover

=

Development Zones



Drinking Water Supply Systems

http://gis.env.gov.nl.ca - Water Resources Map Viewer - Microsoft Internet Explorer

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Government of Newfoundland & Labrador

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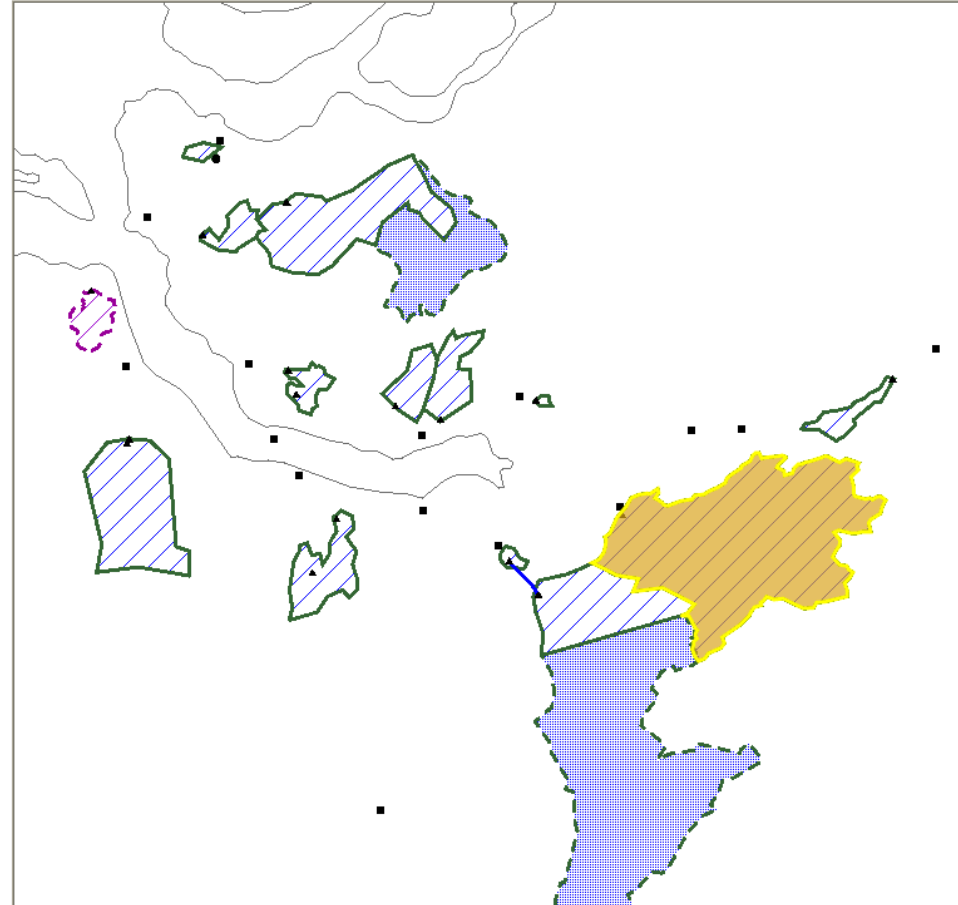
Layers | Layer Groupings | Legend | Key Map | Bookmarks | Selection Tool | Water Quality | Supplementary Information | Help



Search Results

Protected_Legal_Boundaries (1 records selected)

COMMUNITY_NAME: Steady Brook
LGP_NUM: 4935
SERVICED_AREA: Steady Brook
SA_NUM: SA-0737
SOURCE_NAME: Steady Brook
WS_NUM: WS-S-0712
FCODE: enwsprswlb
SUPPLY_STATUS: Public
SUPPLY_TYPE: SW
SOURCE_TYPE: Brook
PROTECTED: P
NUM_OF_WELLS:
CHLORINATION: Gas
OTHER_TREATMENT: Filtration
WATER_SUPPLIES_RETIRED:
POPULATION_SERVICED: 394
SERVICED_AREAS_RETIRED:
REGION_EHV: W
REGION_GSL: W
REGION_HCS: W
REGION_MAPA: W
STATUS: MUN
CEISUS_POPULATION: 394
COMMUNITY_RETIRED:
FID: 2601



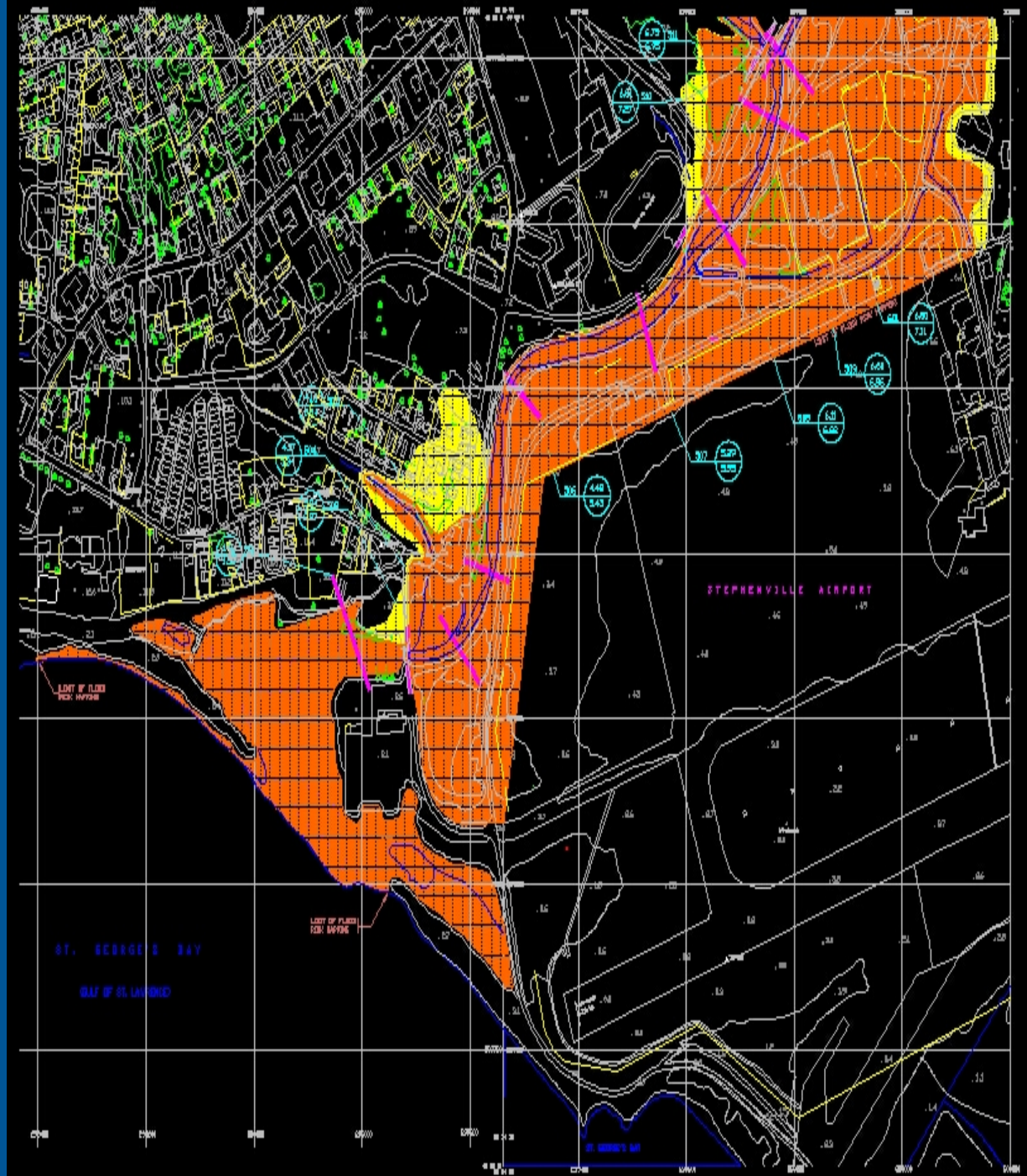
Flood Risk Mapping

- ◆ The province, in cooperation with the federal government, undertook engineering studies and mapping of flood risk areas.
- ◆ Maps completed for 38 communities
- ◆ Delineated the flood risk zones for floods with a return period of
 - 20 years (5% chance in any year)
 - 100 years (1% chance in any year)
- ◆ Project underway to digitize these zones – completion March 31, 2007

Flood Risk Maps

Stephenville

- Orange 1:20
- Yellow 1:100
- Pink Lines – cross sections



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Add Map Service

Add Topographic Layer

Add Outfalls Layer

Add Dams Layer

Add Aquaculture Layer

Server URL or IP Address:

Server Port: 5300

List Services

Available Services

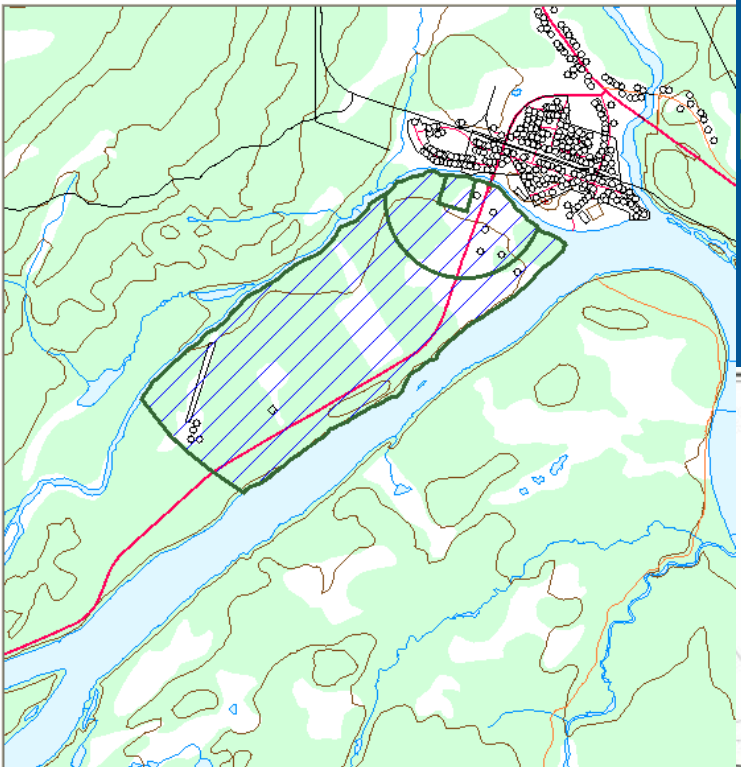
Add Service

Service Management

Environment_SDE

SMD_Resource_Maps_GNL

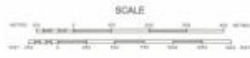
Move Up | Move Down | Remove



Overlaps between Flood Risk Zones Protected Water Supplies are important for emergency response

FLOOD INFORMATION MAP

BADGER • NEWFOUNDLAND



A "designated building" is the area subject to most frequent flooding.

A "designated boundary line" circumscribes the remainder of the flood risk area. The property boundary line designates flood boundaries.

No building should be erected in the "designated boundary" area because damage can result from debris and rising water during storms. However, it is often desirable and may be appropriate to use land in this area for agricultural and recreational purposes.

When the "designated boundary" is used to indicate the area subject to the existing building should receive flood proofing treatment. A variety of these may be used, but the placement of a dike around the building, the construction of a building on raised land, or the special status of a building.

Buildings erected prior to the designation of these two areas may not be eligible for flood damage compensation.



The Government of Canada and Newfoundland and Labrador have agreed to co-operate in the control and reduction of flood damage.

A pilot program has been established to demonstrate in three phases:

- The first consists of mapping the flood risk areas. The Badger study was completed under this phase.
- The second phase consists of studying maps to illustrate the risk of flood damage.
- The third consists of putting constructive advice in place. Phases 2 and 3 will be carried out in several to additional sites.

This is a map of the Badger flood risk area - showing the areas subject to flooding - the "designated boundary" or "designated boundary line" area in yellow.

LEGEND

- Designated Boundary
- 100 Year Flood Area
- 500 Year Flood Area
- High or Medium Flood Risk
- Water
- Highway
- Other

Flood Risk Mapping

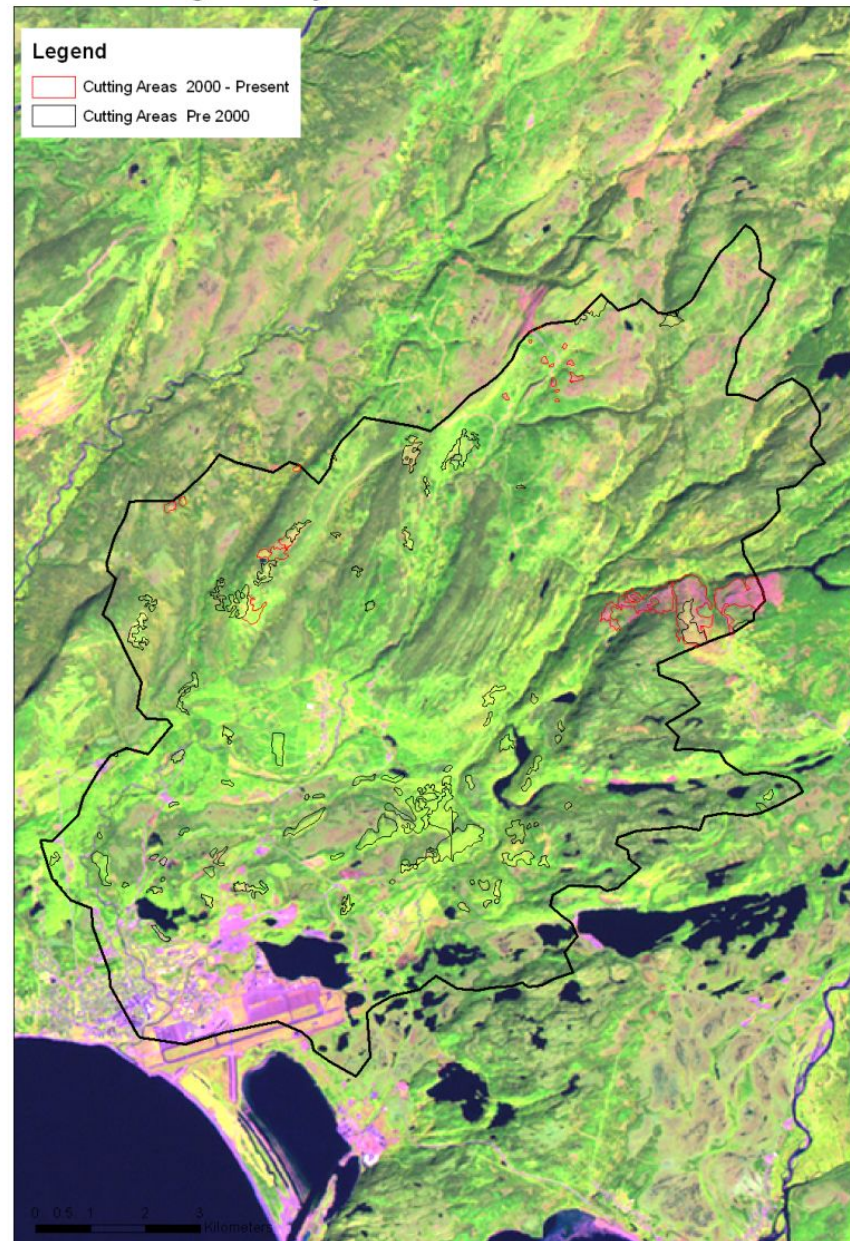
Badger	Petty Harbour
Bishops Falls	Placentia
Brigus	Portugal Cove / St. Philips
Carbonear	Rushoon
Codroy Valley	Rushy Pond
Cox's Cove	Salmon Cove
Deer Lake	Shoal Harbour / Hodges Cove
Ferryland	Steady Brook
Gaudon's Brook / Cold Brook	Stephenville
Glenwood / Appleton	Stephenville Crossing/ Black Duck Siding
Glovertown	Trout River
Hant's Harbour	Victoria
Heart's Delight	Waterford River
Hickman's Harbour	Whitbourne
Outer Cove	Winterton
Parson's Pond	

Flood Area Watershed Maps

Stephenville Flood
Sept 27, 2005

- Did wood harvesting contribute to flooding?
- Have conditions worsened?

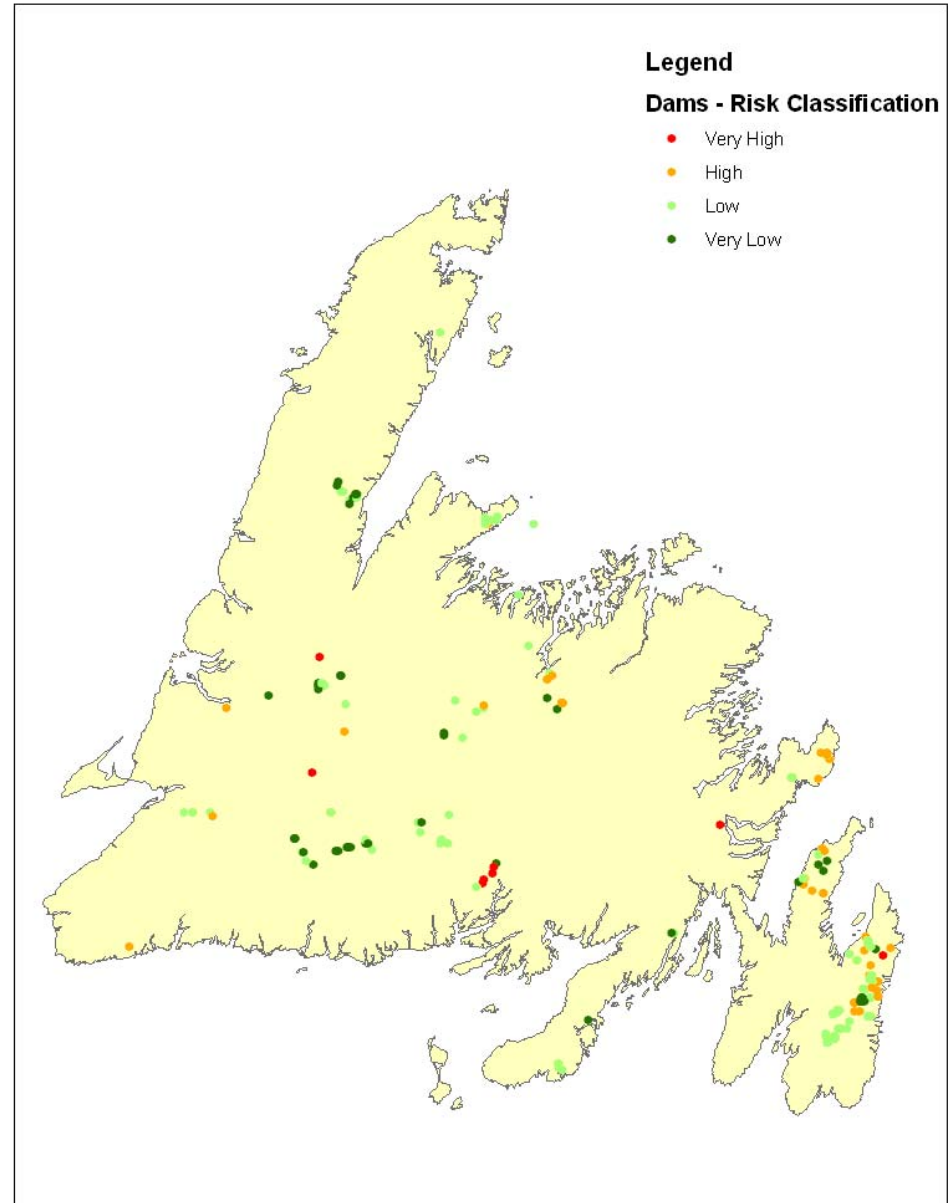
Map 3
Cutting Activity - Blanche Brook Watershed



Dam Safety

Industrial Dams

Municipal Dams





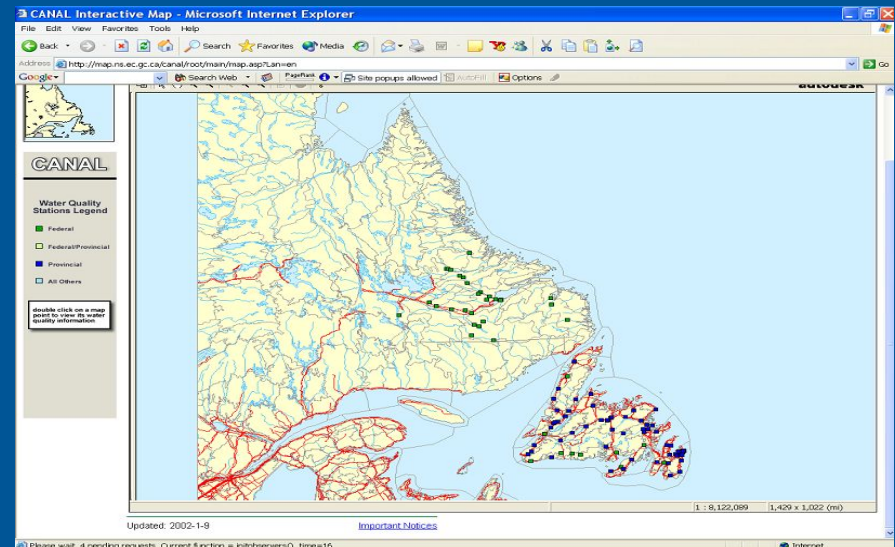
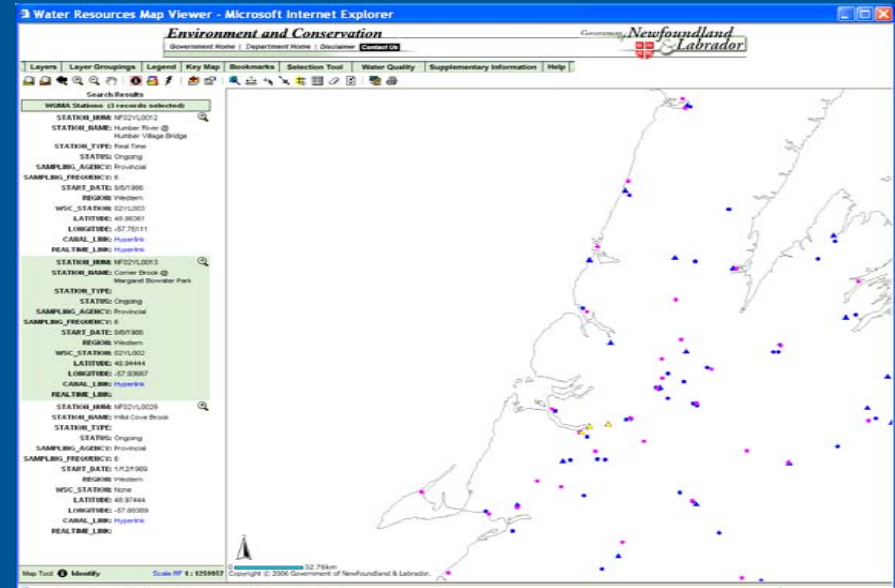
Dams Safety

The screenshot shows the ArcMap interface with a map of Newfoundland. Numerous blue dots are scattered across the landmass, representing dam locations. An 'Identify Results' window is open, showing the following data for a selected dam:

Field	Value
OBJECTID	394
LAT_DEC	46.96583
LONG_DEC	-55.54222
DAMINDEXNUM	219
PROJECT_NAME	Lawn
DAM_NAME	Lawn Forebay Spillway
OWNER_NAME	Newfoundland Power Inc.
DAMSTATUS	Active
DAMSTATUS_OTHER_TEXT	<null>
DAMS_DOC_INDEX	620
DAM_THEME	Reports
DAMS_DESC	Emergency Preparedness Plan (Same Document for all Newfoundland Power Inc. Dams)
DOC_NAME	90-Dam Safety Emergency Preparedness Plan_2005 11 RevB.pdf
DOC_HYPERLINK	http://www.wrmd.env.gov.nl.ca/DamDatabase/Documents/90-Dam Safety Emergency Preparedness Plan_2005 11 RevB.pdf
Shape	Point

Other Geomatic Information

- ◆ Sewage Outfalls
- ◆ Ambient Water Quality Monitoring Sites
- ◆ Ambient Water Quality Watersheds
- ◆ Hydrometric Monitoring Sites
- ◆ Climate Network
- ◆ Ambient Water Quality Contours



Focus 3

Proper Context And In A Visual Format

“Linking all that we know”

**Ability to access information in
its proper context and in a visual
format is critical for effective
Emergency Response**

Geographic Information System (GIS)

- ◆ A computer system capable of integrating, storing, editing, analyzing, sharing, and displaying geographically-referenced information
- ◆ GIS is a tool that allows users to create interactive queries (user created searches), analyze the spatial information, edit data, maps, and present the results of all these operations.

GIS

Water Resources Map Viewer - Microsoft Internet Explorer

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Search Results
Tap_Water_View (Record 1 of 50 selected)
Prev Next Export

OBJECTID: 163
SAMPLE_IJUM: 2001-2072-01-TI-RE
SA_IJUM: SA-0235
SAMP_DATE: 8/30/2001
LAB: AT
ALKALINITY: 186
COLOR: 1
CONDUCTIVITY: 637
HARDNESS: 0.5
PH: 9.12
TDS: 380
TSS:
TURBIDITY: 9.9
BOROH: 0.09
BROMIDE: 0.25
CALCIUM: 0.5
CHLORIDE: 66
FLUORIDE: 2.2
POTASSIUM: 1
SODIUM: 146
SULPHATE: 41
AMMONIA: 0.15
DOC: 0.25
NITRATE_IJTE: 0.05
KJELDAHLNITROGEN: 0.16
TOTALPHOSPHORUS: 0.02

Map Tool: Zoom In Scale RF 1 : 4524864
0 117.65km
Copyright © 2004 Government of Newfoundland & Labrador.

Map Coordinates (m): 866298 , 5578944 Internet

start Novell GroupWise... Microsoft PowerP... http://gis.env.go... Water Resources... 1:54 PM

Why use GIS?

- ◆ Real Time/Dynamic Public Reporting
- ◆ Future of information sharing
- ◆ Environmental data is essentially spatial in nature
- ◆ The spatial attribute allows widely varying datasets to be easily related
- ◆ For example:
 - Areal/spatial analysis shows the variation of a variable in a region
 - See what is within a buffer zone around features such as an intake

The DWQ GIS Application

- ◆ Developed in approximately a year and a half
 - Uses the ESRI ArcGIS software suite.
 - Requires only the Internet Explorer browser (6.0 and above) on the end users machine
 - Requires high speed internet connection
- ◆ Accessible anywhere on the internal government network including the regional offices
- ◆ Will be made available to the public at a later stage of the project
- ◆ Application "*went live*" in May 2004
- ◆ Winner of ESRI Canada 2005 Award of Excellence

The Application

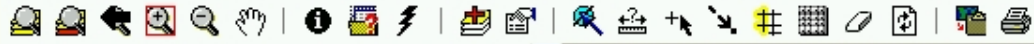
- ◆ Application address:
 - <http://gis.env.gov.nl.ca/wrmd/>
 - ◆ Username: government
 - ◆ Password: supplies
- ◆ Live demonstration of application ??

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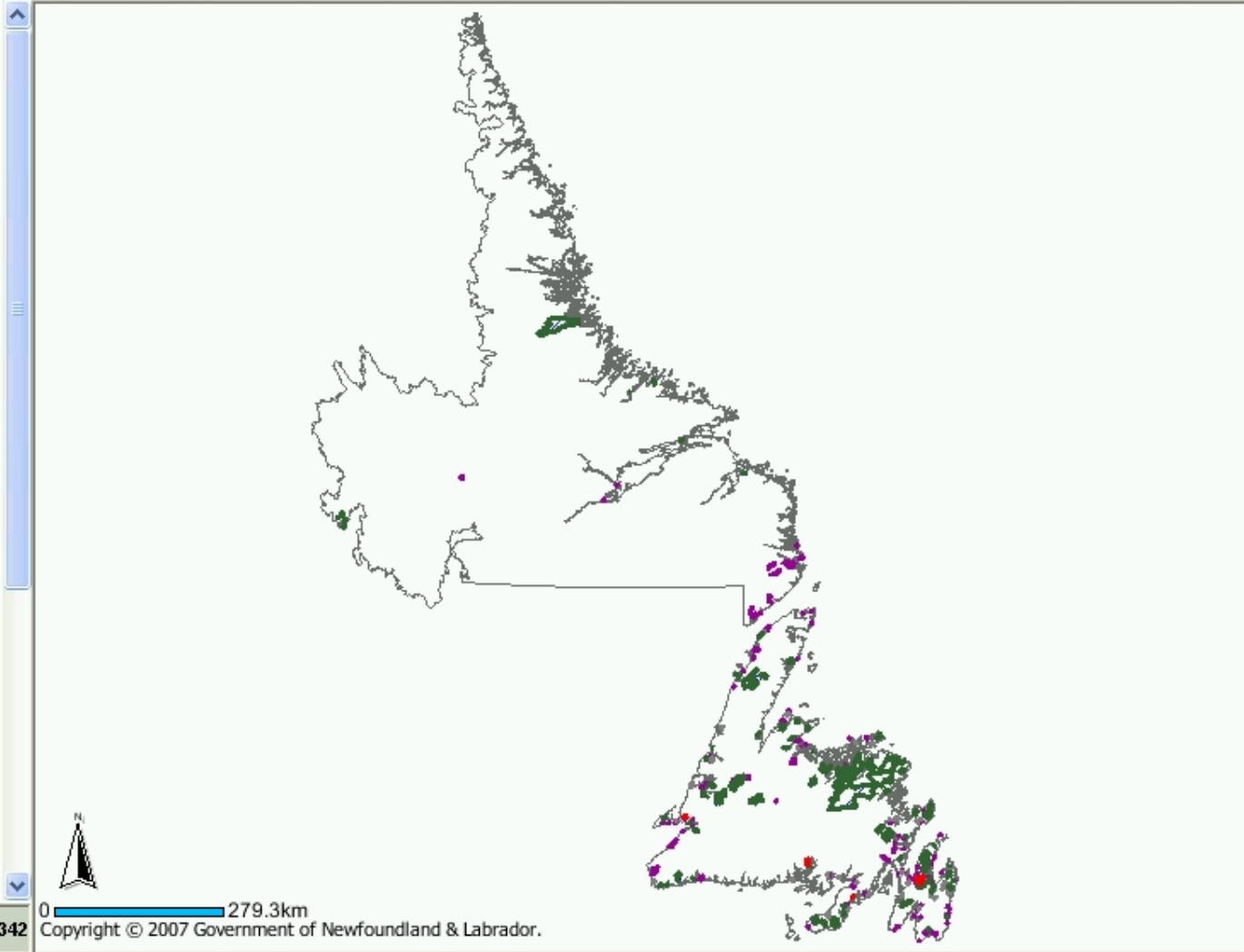
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Map Layers

- | Visible | Active | Layer Name |
|-------------------------------------|-------------------------------------|-----------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | NTS50 Grid |
| <input type="checkbox"/> | <input type="checkbox"/> | Photos |
| <input type="checkbox"/> | <input type="checkbox"/> | Communities |
| <input type="checkbox"/> | <input type="checkbox"/> | Climate Stations |
| <input type="checkbox"/> | <input type="checkbox"/> | Hydrometric Stations |
| <input type="checkbox"/> | <input type="checkbox"/> | WQMA Stations |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Intakes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Potential_Intakes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Protected_Intakes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Unprotected_Intakes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Wellheads |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Potential_Wellheads |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Protected_Wellheads |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Unprotected_Wellheads |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Diversion_Pipes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Potential_Diversion_Pipes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Protected_Diversion_Pipes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Unprotected_Diversion_Pipes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Legal_Boundaries |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Protected_Legal_Boundaries |



Map Tool: **Zoom In** Scale RF 1 : 10742342

0 279.3km
Copyright © 2007 Government of Newfoundland & Labrador.

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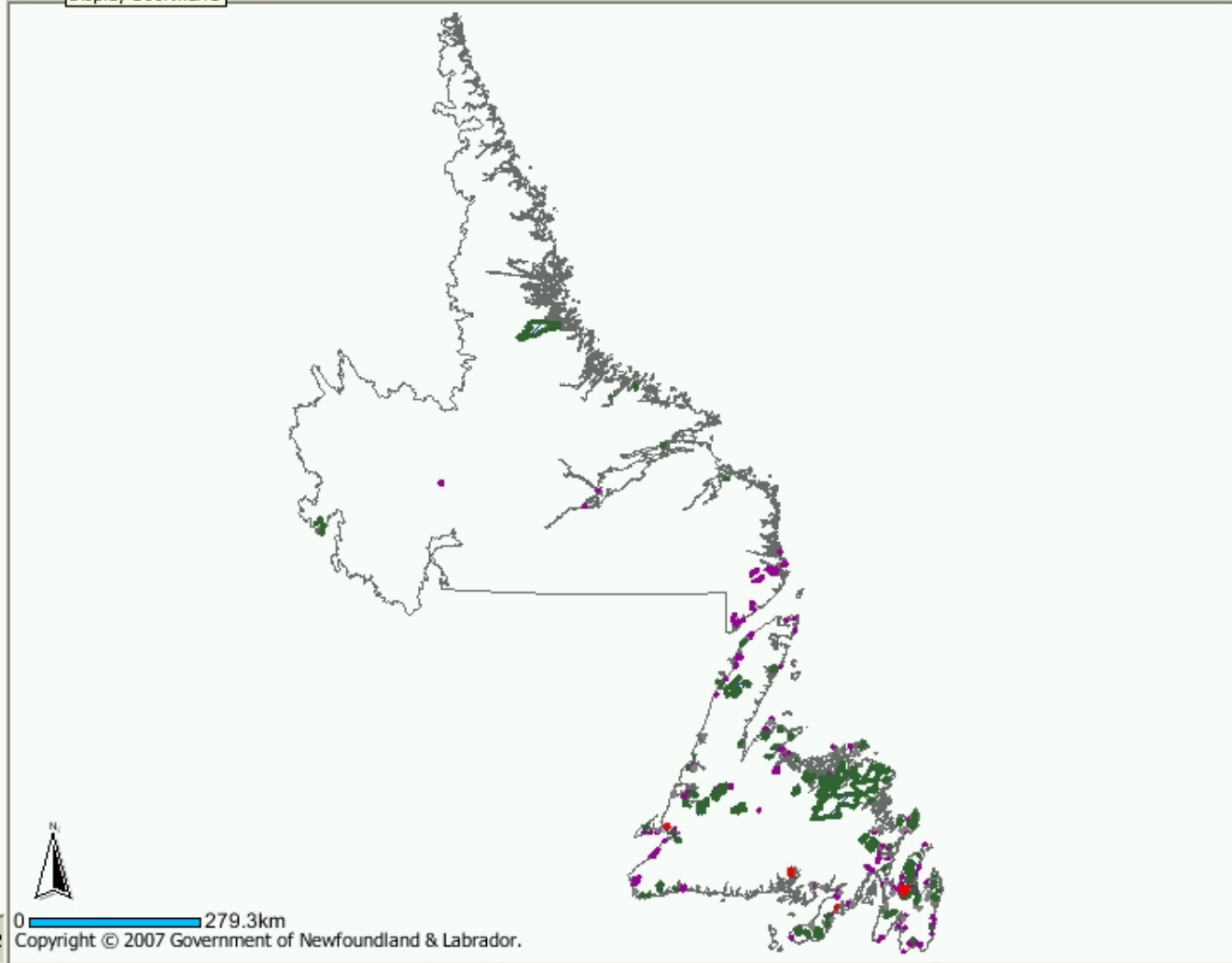
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Bookmarks

- Newfoundland
- Labrador
- Western
- Central
- Eastern
- Labrador City - Wabush
- Happy Valley - Goose Bay
- Southern Labrador
- Northern Peninsula
- Corner Brook - Deer Lake
- Port au Port Peninsula
- Port aux Basques
- South Coast
- Burin Peninsula
- Avalon Peninsula
- Bonavista Bay
- Notre Dame Bay
- Grand Falls - Gander



Map Tool: **Zoom In** Scale RF 1 : 10742342

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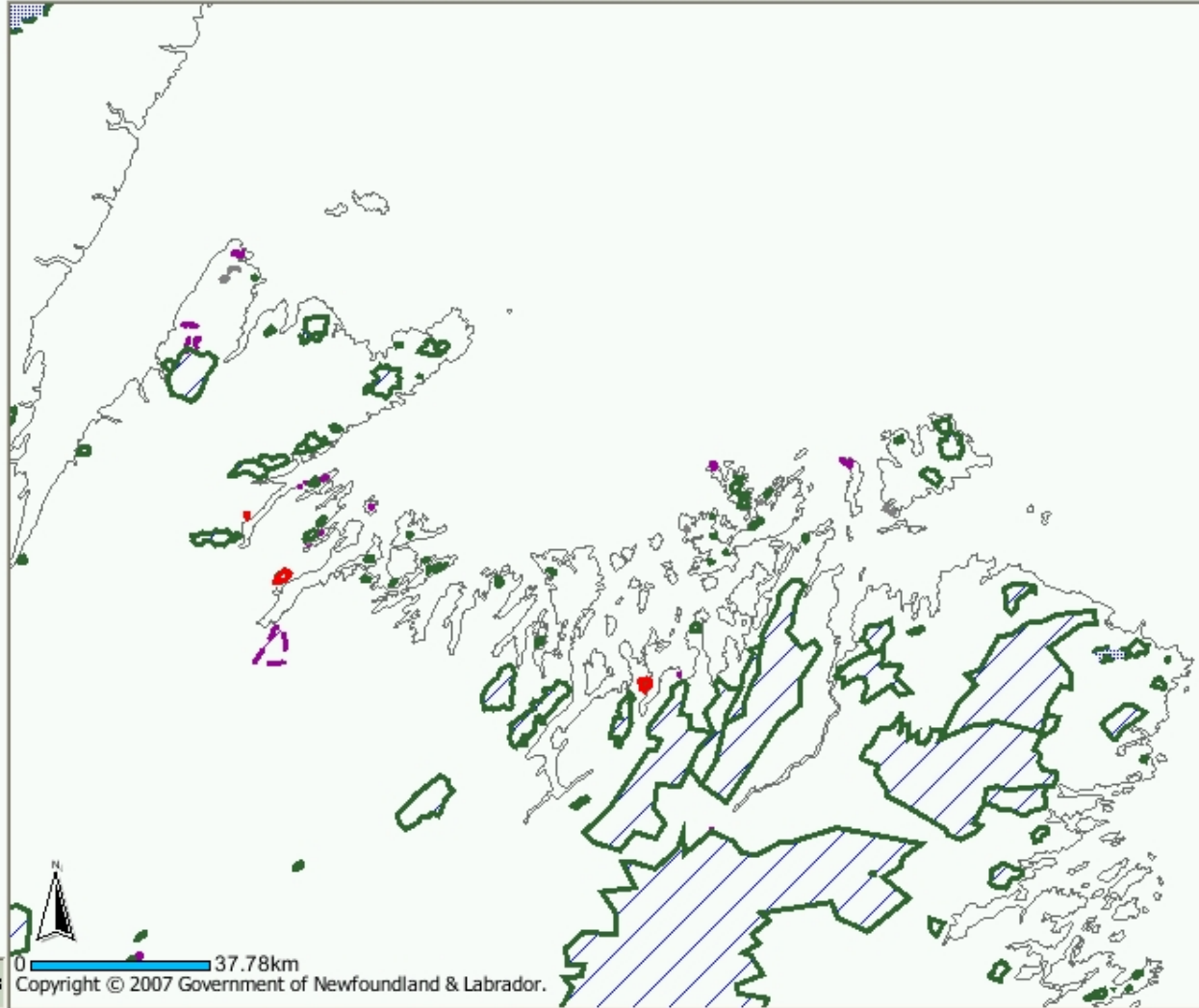
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- Avalon Peninsula
- Bonavista Bay
- Notre Dame Bay
- Grand Falls - Gander



Map Tool: **Zoom In** Scale RF 1 : 1453203

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Zoom to Notre Dame Bay.

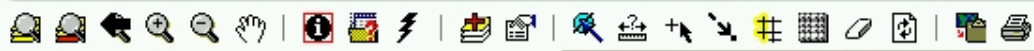
Internet

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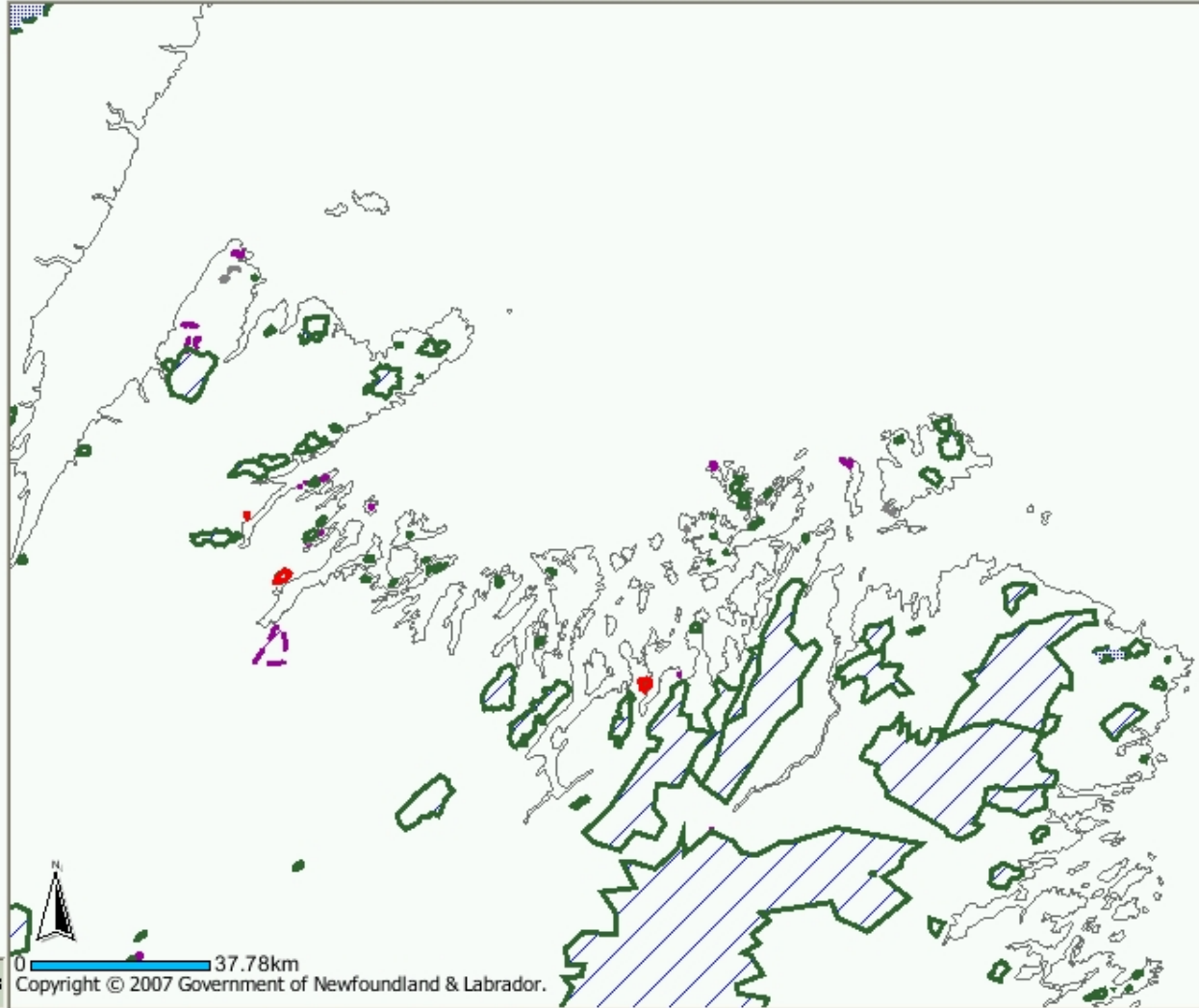
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Map Legend

-  ILUC_Legal_Boundaries
-  Protected_Legal_Boundaries
-  ILUC_Natural_Drainage_Outside
-  Potential_Natural_Drainage
-  Natural_Drainage_Outside
-  Unprotected_Natural_Drainage
-  LANDBASE



Map Tool:  **Identify**

Scale RF 1 : 1453203

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Search Results

Protected_Legal_Boundaries (1 records selected)

COMMUNITY_NAME: Campbellton

LGP_NUM: 830

SERVICED_AREA: Campbellton

SA_NUM: SA-0114

SOURCE_NAME: Indian Arm Brook

WS_NUM: WS-S-0112

FCODE: enwsprswlb

SUPPLY_STATUS: Public

SUPPLY_TYPE: SW

SOURCE_TYPE: Brook

PROTECTED: P

NUM_OF_WELLS:

CHLORINATION: Gas

OTHER_TREATMENT: Infiltration Gallery

WATER_SUPPLIES_RETIRED:

POPULATION_SERVICED: 474

SERVICED_AREAS_RETIRED:

REGION_ENV: C

REGION_GSL: Gan

REGION_HCS: C

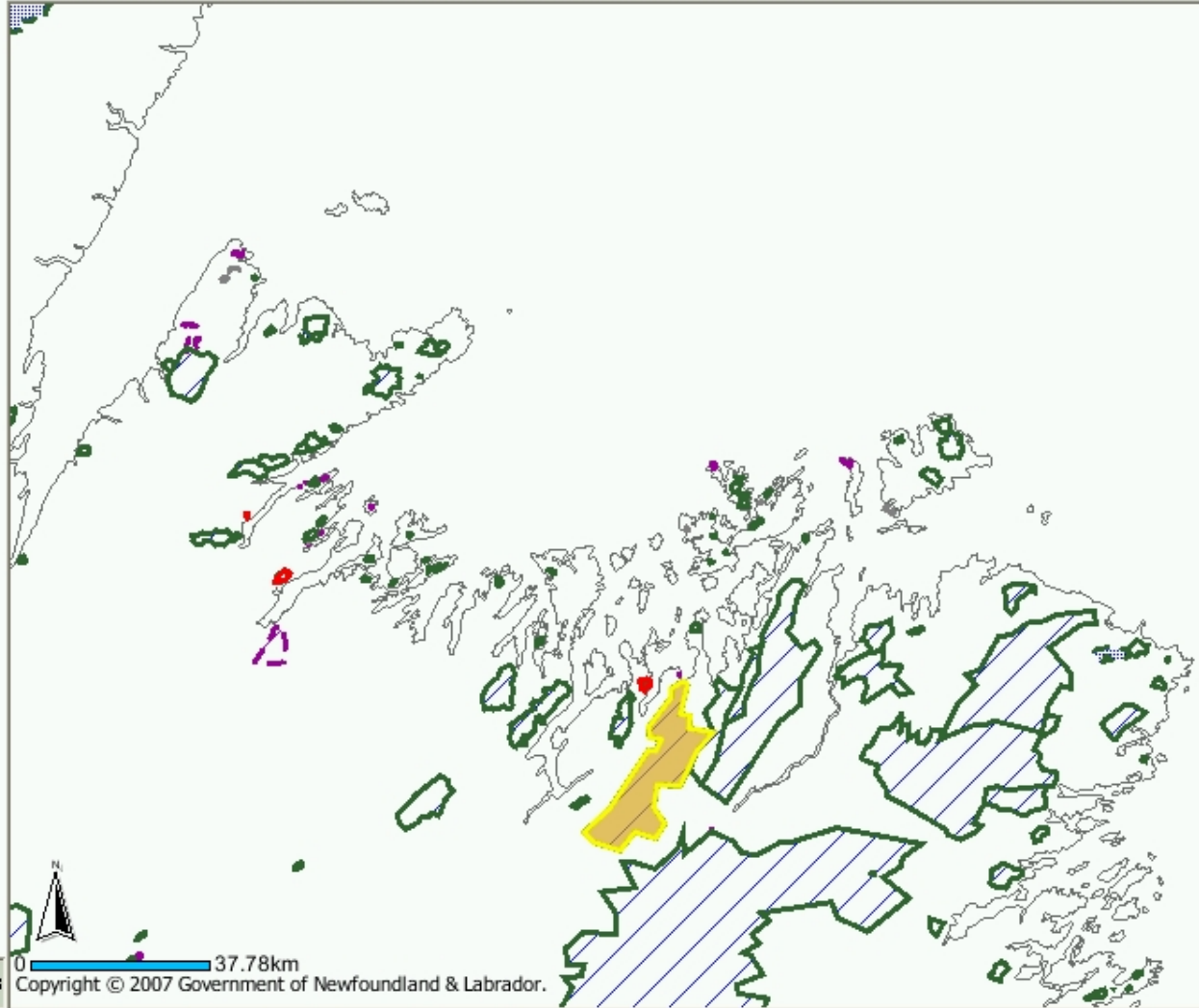
REGION_MAPA: C

STATUS: MUN

CENSUS_POPULATION: 565

COMMUNITY_RETIRED:

FID: 429



Map Tool: **Identify** Scale RF 1 : 1453203

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49°7'35.5" North 54°59'2.8" West UTM Zone: 21 647067 East 5443481 North

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Water Supply Query Builder

Source Water

DOC > 5

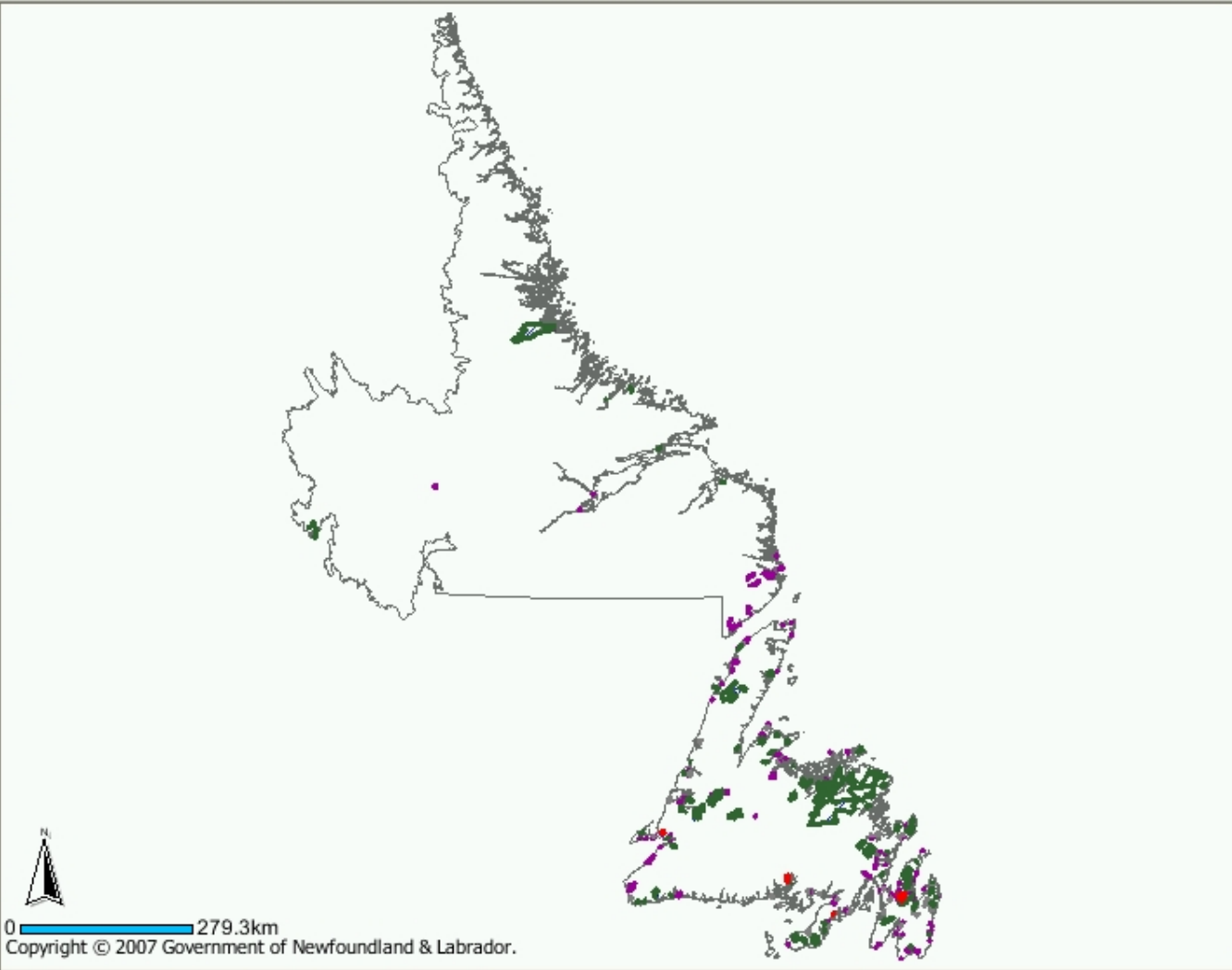
And Or

COLOR > 30

And Or

PH > 7.5

Show Retired Records



Map Tool: Scale RF 1 : 10742342

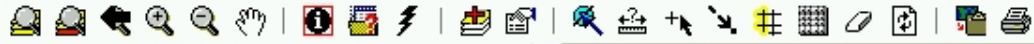
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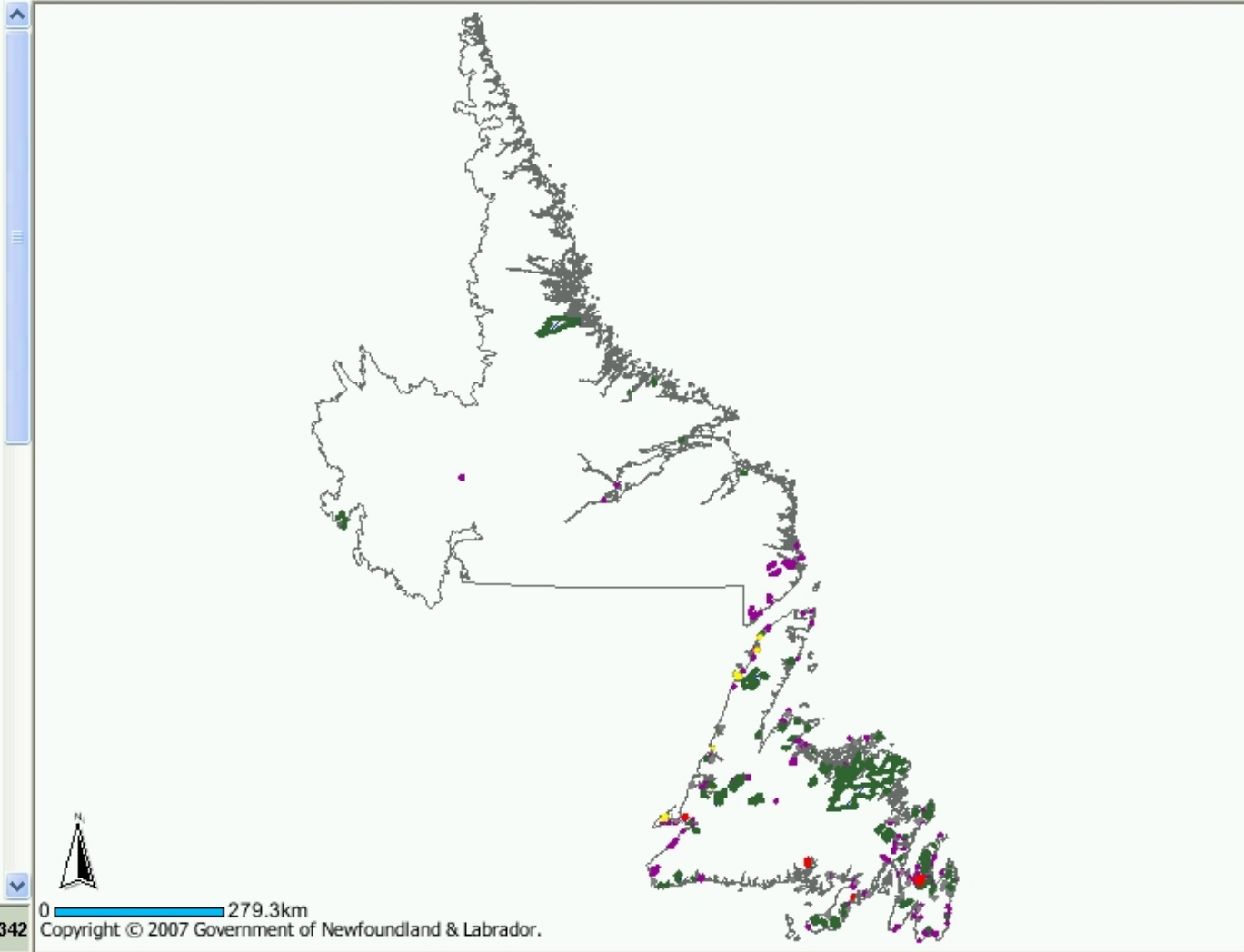
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Search Results

Source_Water_View (Record 1 of 92 selected)

COMMUNITY_NAME:
SERVICED_AREA:
OBJECTID: 7139
SOURCE_NAME:
WS_NUM: WS-G-0071
SAMP_DATE: Nov-19-2001
SAMPLE_NUM: 2001-6662-00-SI-RE
LAB: AT
ALKALINITY: 244
COLOR: 38
CONDUCTIVITY: 544
HARDNESS: 250
PH: 7.83
TDS: 328
TSS:
TURBIDITY: 0.2
BORON: 0.025
BROMIDE: 0.14
CALCIUM: 49
CHLORIDE: 29
FLUORIDE: 0.05
POTASSIUM: 1
SODIUM: 17
SULPHATE: 7
AMMONIA: 0.01



Map Tool: Identify Scale RF 1 : 10742342

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53°41'3.2" North 73°55'27.6" West UTM Zone: 19 174892 East 5959658 North

Internet

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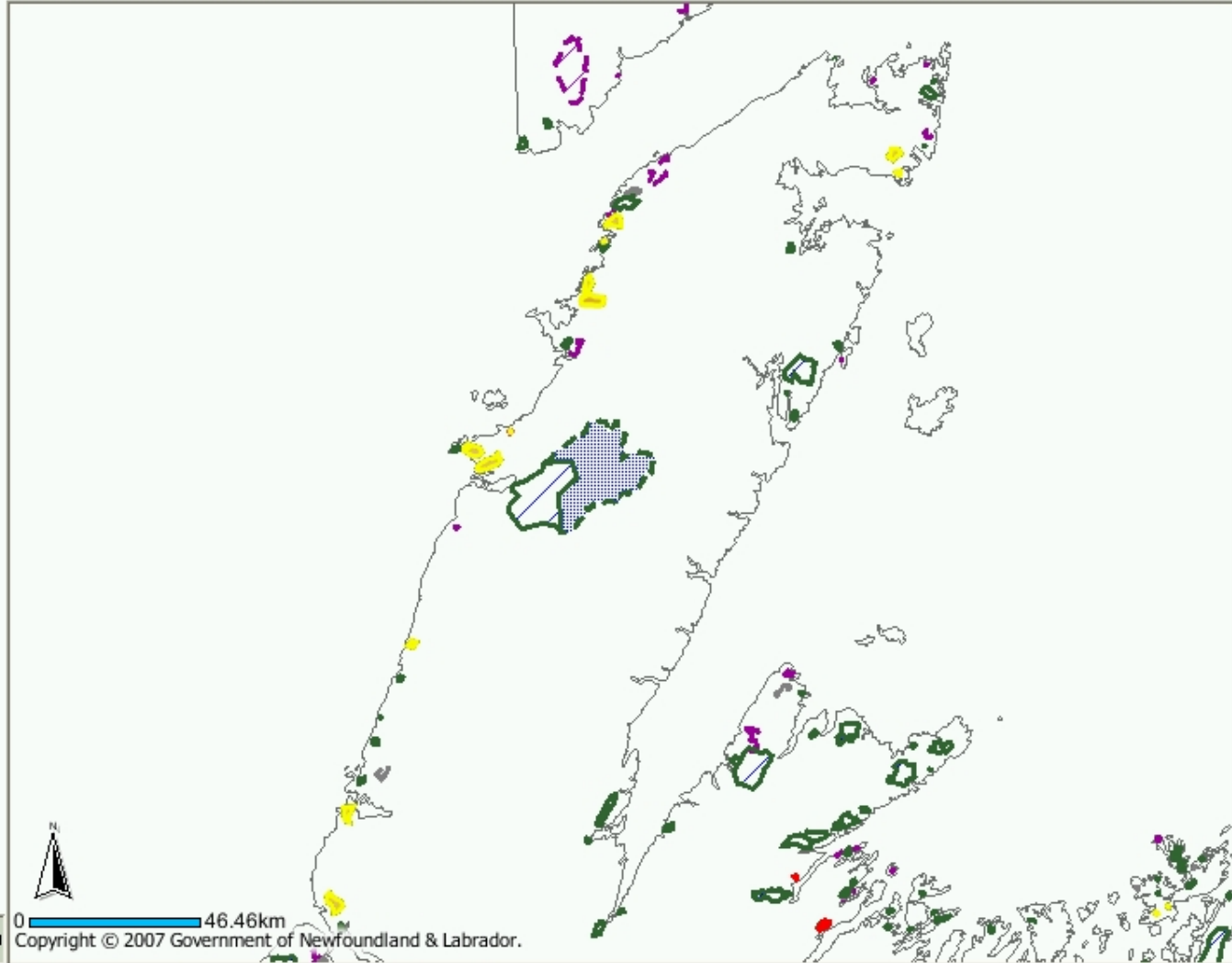
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- Northern Peninsula
- Corner Brook - Deer Lake
- Port au Port Peninsula
- Port aux Basques
- South Coast
- Burin Peninsula
- Avalon Peninsula
- Bonavista Bay
- Notre Dame Bay
- Grand Falls - Gander



Map Tool: **Identify** Scale RF 1 : 1786900

Zoom to the Northern Peninsula.

Internet

A1 COMMUNITY_NAME

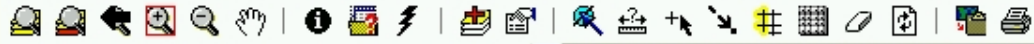
	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
	SAMPLE_NUM	LAB	ALKALINITY	COLOR	CONDUCTIVITY	HARDNESS	PH	TDS	TSS	TURBIDITY	BORON	BROMIDE	CALCIUM	CHLORIDE	FLUORIDE	POTASSIUM	SODIUM	SULP
1																		
2	2001-6662-00-SI-RE	AT	244	38	544	250	7.83	328		0.2	0.025	0.14	49	29	0.05	1	17	7
3	2004-6818-00-SI-RE	AT	197	103	762	189	7.93	495	8.8	0.02	0.25	79	123	0.12	5	72	12	
4	2005-6521-00-SI-RE	AT	147	87	489	126	7.73	318	10.2	0.01	0	44	59	0	3	53	16	
5	2002-6563-00-SI-RE	AT	221	44	567	142	8.15	369	7.2	0.11	0.13	32	45	0.54	9	63	10	
6	2002-6562-00-SI-RE	AT	384	34	1110	228	8.55	722	16.9	0.17	0.44	50	136	0.51	26	160	7	
7	2004-6585-00-SI-RE	AT	368	33	1040	161	7.83	676	26.8	0.2	0	30	124	0	19	151	3	
8	2004-6816-00-SI-RE	AT	397	55	1130	156	8.31	735	22.2	0.19	0.67	40	145	0.13	25	171	4	
9	2005-6519-00-SI-RE	AT	379	65	956	139	8.25	621	4	0.16	0.29	26	104	0.1	19	163	3	
10	2006-6854-00-SI-RE	AT	368	70	1070	170	8.23	696	13.5	0.18	0.4	35	123	0	19	147	3	
11	2004-6817-00-SI-RE	AT	186	114	861	234	7.87	560	26.2	0.02	0.45	84	160	0.12	5	89	20	
12	2005-6520-00-SI-RE	AT	210	63	835	211	7.73	543	3	0.02	0.2	73	135	0	4	98	25	
13	2006-6856-00-SI-RE	AT	235	163	645	164	7.73	419	8.4	0.02	0.12	59	58	0	3	66	10	
14	2001-6661-00-SI-RE	AT	123	67	310	145	7.57	204	0.7	0.025	0.025	45	20	0.63	0.5	12	12	
15	2002-6585-00-SI-RE	AT	154	43	353	159	7.87	229	0.2	0.01	0.025	47	17	0.1	0.5	11	6	
16	2003-6662-00-SI-RE	AT	128	46	298	124	7.93	194	0.3	0.025	0.025	38	16	0.05	0.5	11	6	
17	2003-6813-00-SI-RE	AT	123	56	307	126	7.71	200	0.5	0.005	0.025	39	20	0.11	0.5	12	7	
18	2004-6729-00-SI-RE	AT	154	42	337	172	7.58	219	0.5	0.01	0	54	20	0	0	12	6	
19	2004-6730-00-SI-RE	AT	128	44	288	144	7.65	187	0.5	0	0	46	18	0	0	11	5	
20	2004-6731-00-SI-RE	AT	173	40	378	198	7.61	246	0.4	0.01	0	61	21	0	0	13	7	
21	2005-6588-00-SI-RE	AT	150	51	340	158	7.93	221	7.2	0.01	0	50	18	0	0	12	6	
22	2005-6589-00-SI-RE	AT	170	48	392	184	7.92	255	0.4	0.02	0	57	20	0	0	13	6	
23	2006-6539-00-SI-RE	AT	95	49	244	100	7.53	159	0.6	0	0	30	17	0	0	10	7	
24	2006-6540-00-SI-RE	AT	116	65	295	116	7.73	192	0.7	0	0	35	22	0	0	12	6	
25	2006-6730-00-SI-RE	AT	190	43	447	191	7.97	291	2.1	0.01	0	60	22	0	0	13	12	
26	2006-6731-00-SI-RE	AT	190	34	433	188	7.89	281	0.4	0.02	0.07	57	21	0	0	12	8	
27	2001-6667-00-SI-RE	AT	190	31	691	112	8.14	404	7.3	0.07	0.25	25	85	0.5	9	86	20	
28	2006-4193-00-SI-RE	AT	150	37	326	151	8.07	212	1.4	0	0	44	12	0	0	8	5	
29	1995-7229-00-SI-RE	NBE	34.1	40	159		7.64	100	0.6			9.1	21.9	0.05	0.73	13.2	7.53	
30	1995-7107-00-SI-RE	NBE	74	35	163		8.14	110	0.4			14.9	5.4	0.029	0.39	3.96	1.58	
31	1998-7225-00-SI-RE	WVAL	80.8	36	212		7.98	141	1	0.76		21.9	8.7		0.4	5.73	1.7	
32	2003-4257-00-SI-RE	AT	107	38	243	106	7.64	158	1.5	0.005	0.025	21	0.5	0.05	0.5	7	4	
33	2006-4248-00-SI-RE	AT	109	35	251	111	8.08	163	1.3	0	0	23	13	0	0	8	3	

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Add Map Service

Add Topographic Layer

Add Outfalls Layer

Add Dams Layer

Add Aquaculture Layer

Server URL or IP Address:

Server Port:

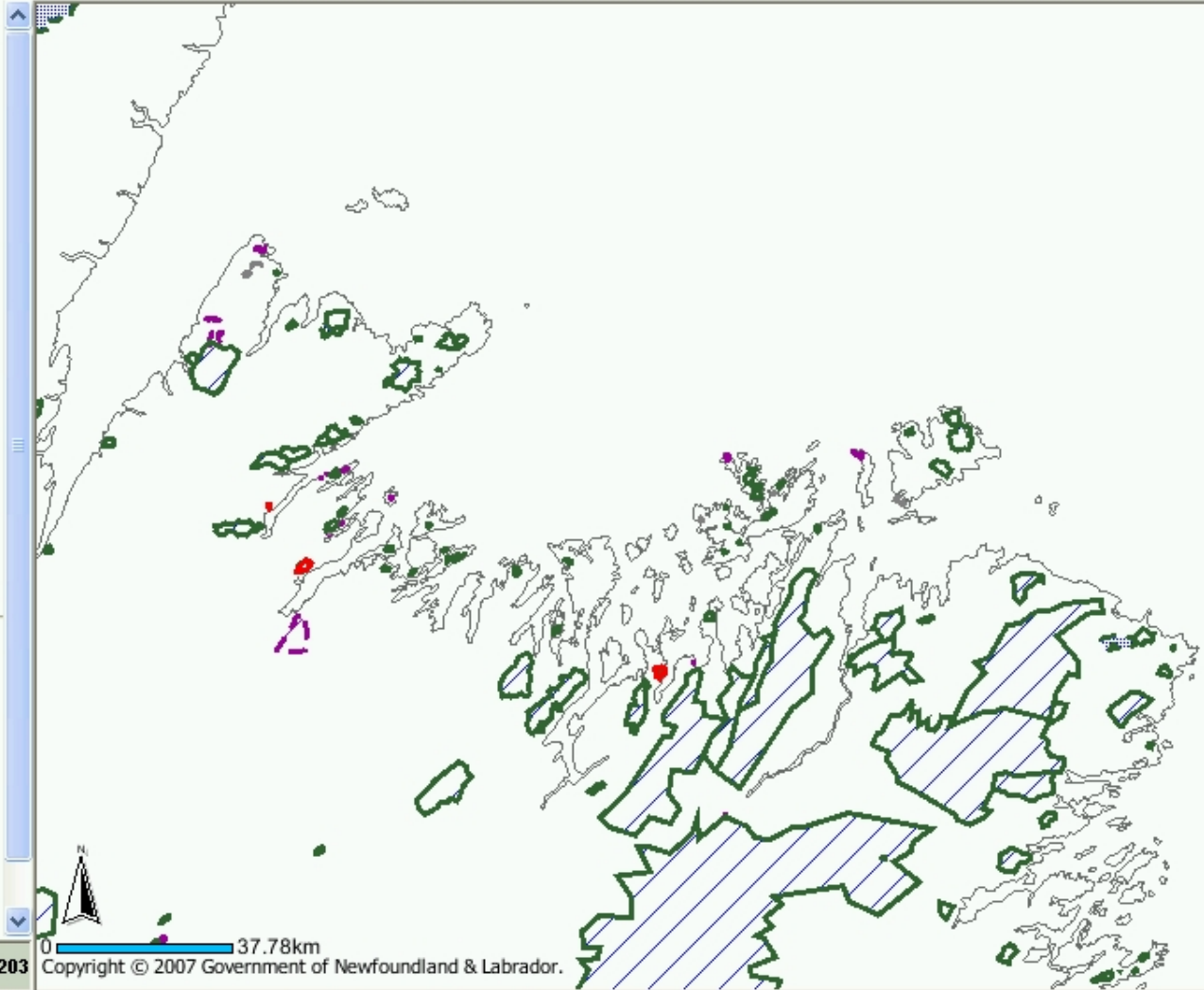
List Services

Available Services

Add Service

Service Management

Environment_SDE



0 37.78km

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Map Tool: Zoom In

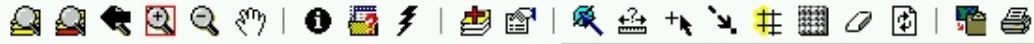
Scale RF 1 : 1453203

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Add Map Service

-
-
-
-

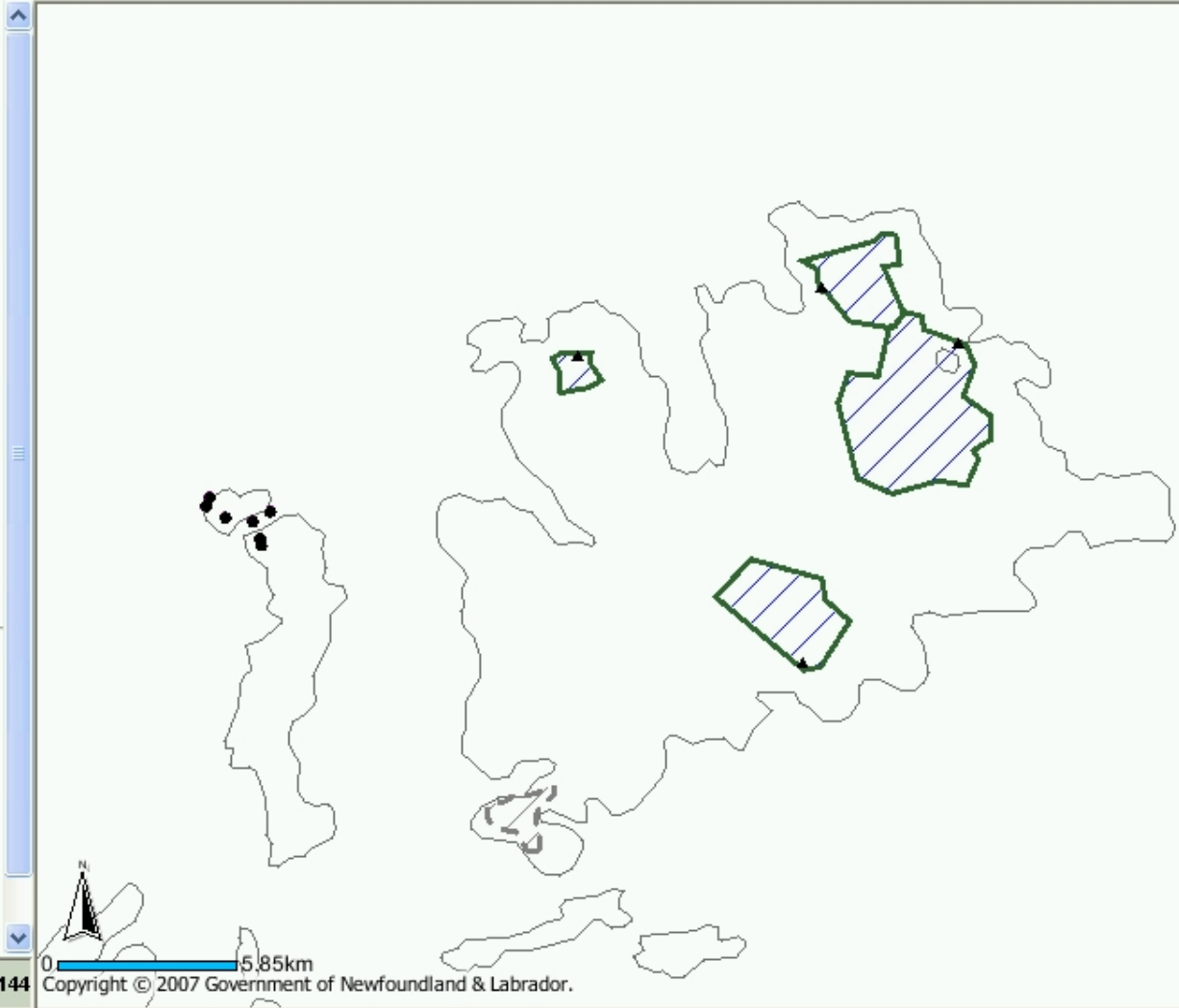
Server URL or IP Address:

Server Port:

Available Services

Service Management

Environment_SDE



Map Tool:

Scale RF 1 : 225144

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49°38'51.4" North 54°3'23.2" West UTM Zone: 21 712477 East 5503615 North

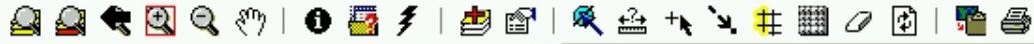
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Add Map Service

Add Topographic Layer

Add Outfalls Layer

Add Dams Layer

Add Aquaculture Layer

Server URL or IP Address:

Server Port:

List Services

Available Services

Add Service

Service Management

Environment_SDE
SMD_Resource_Maps_GNL



Map Tool: Scale RF 1 : 225144

49°47'5.9" North 54°29'27.4" West UTM Zone: 21 680607 East 5517744 North

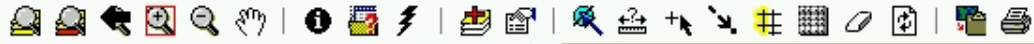
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Add Map Service

Add Topographic Layer

Add Outfalls Layer

Add Dams Layer

Add Aquaculture Layer

Server URL or IP Address:

Server Port:

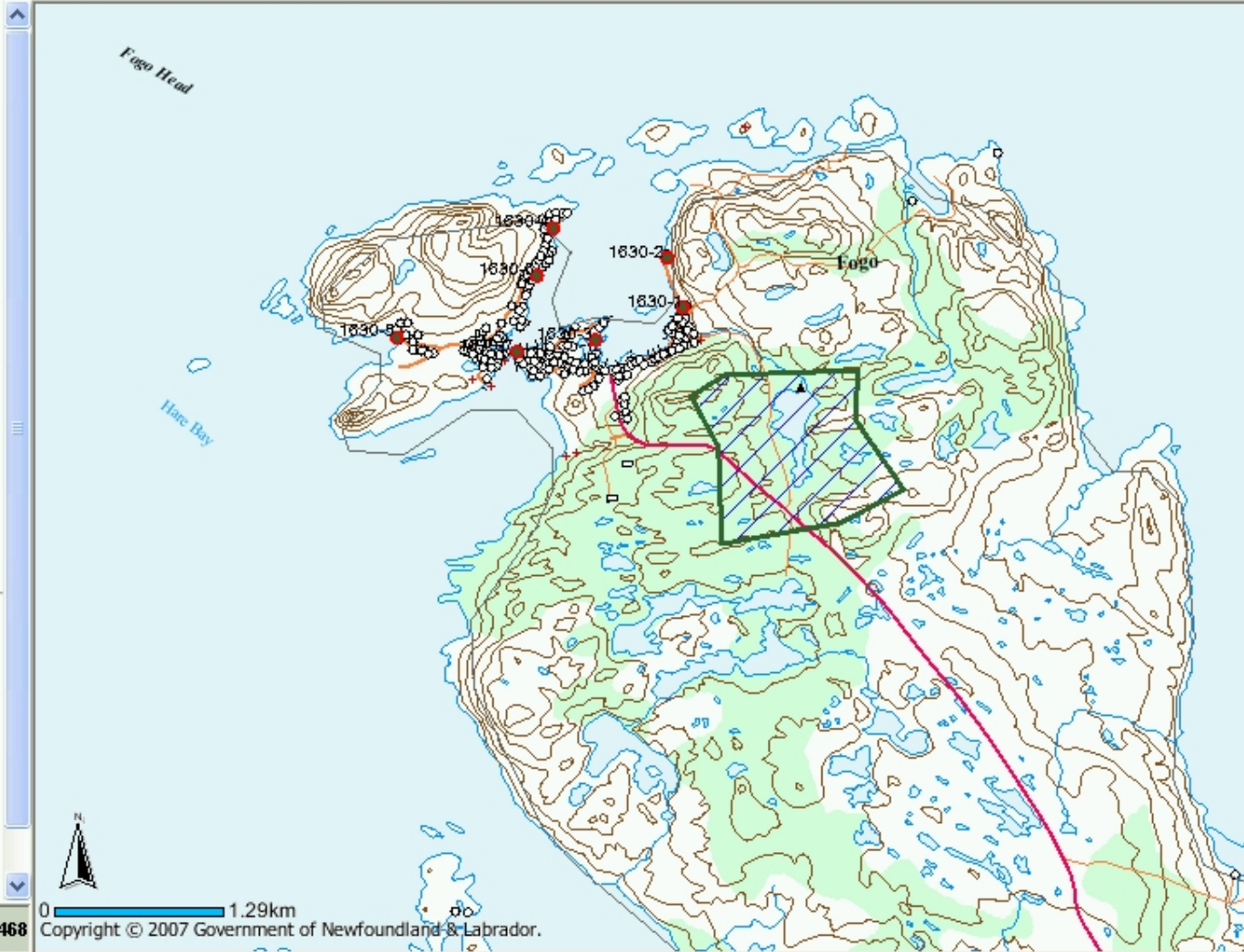
List Services

Available Services

Add Service

Service Management

Outfalls_GNL1
Environment_SDE
SMD_Resource_Maps_GNL



0 1.29km
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Map Tool:

Scale RF 1 : 49468

49°42'27.4" North 54°20'9.6" West UTM Zone: 21 692064 East 5509532 North

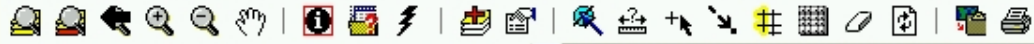
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Search Results

WRMD.OUTFALL_LOCATION_DOCUMENTS (1 records selected)

OUT_ID: 1630-4

COMMUNITY_NAME: Fogo

LAT_DEC: 49.72353

LONG_DEC: -54.28022

DOC_NAME: 1630-4_DCP_1391.JPG

OTF_THEME: DOEC Photo

OTF_DESC:

DOC_HYPERLINK: [Hyperlink](#)

LGP_NUM: 1630

DFO_ID:

CWWS_REGION: Central

NTS_NUM: 2E9

OUTFALL_NAME:

LOCATION_DESC:

OUT_TYPE: Permanent

LAT_DEG: 49

LAT_MIN: 43

LAT_SEC: 24.7

LONG_DEG: 54

LONG_MIN: 16

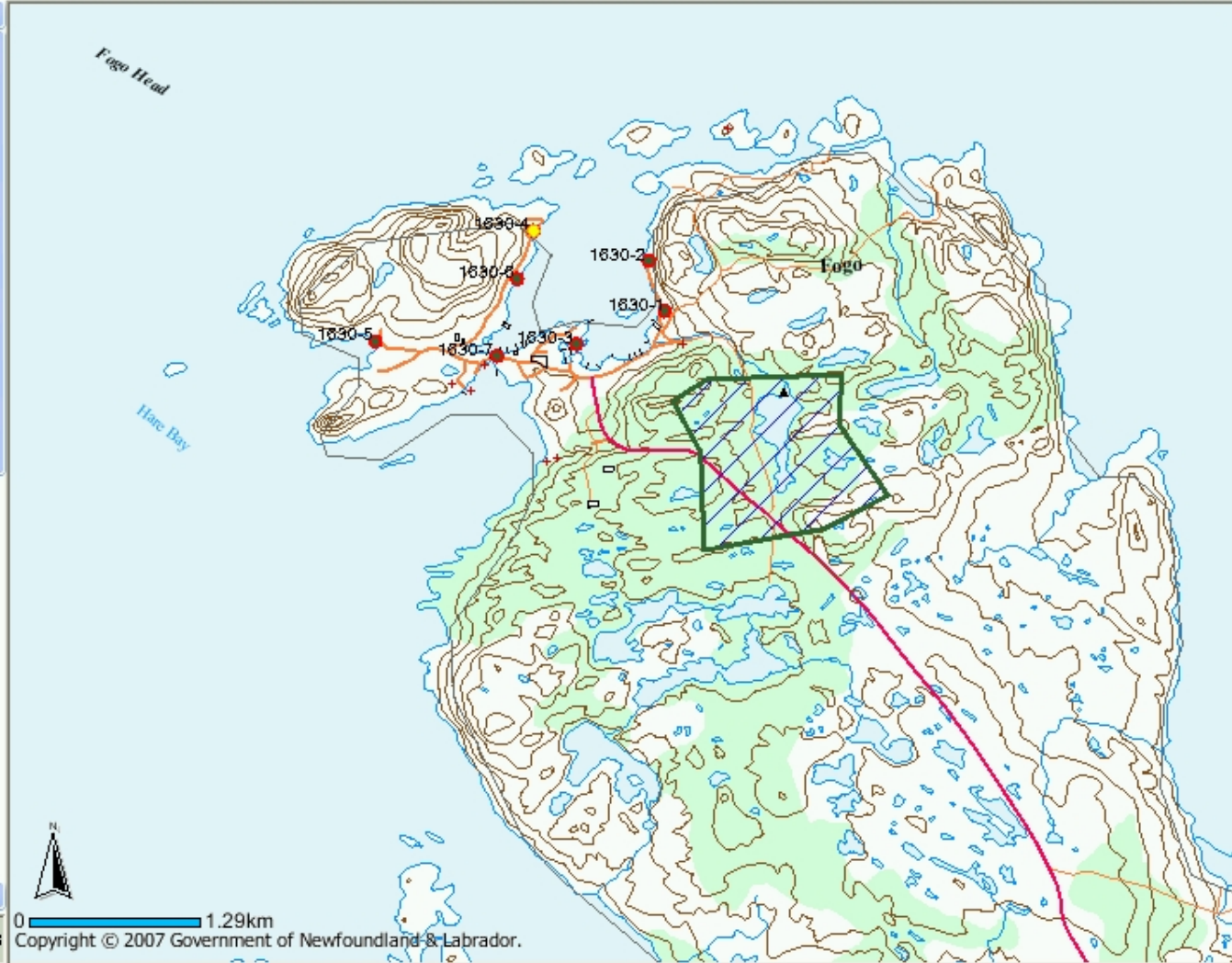
LONG_SEC: 48.8

POINT_QUALITY: GPS or Map

PERMIT_NUM: WVS00-03-0291

PERMIT_DATE: 3/1/2000

DRAWING_LOC:



Map Tool: **Identify** Scale RF 1: 49468

0 1.29km Copyright © 2007 Government of Newfoundland & Labrador.

49°43'18.2" North 54°16'42" West UTM Zone: 21 696164 East 5511248 North

Internet

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Search Results

WRMD.OUTFALL LOCATION DOCUMENTS (1)

http://www.wrmd.env.gov.nl.ca/sewageoutfalls/Documents/1630-4_DCP_...

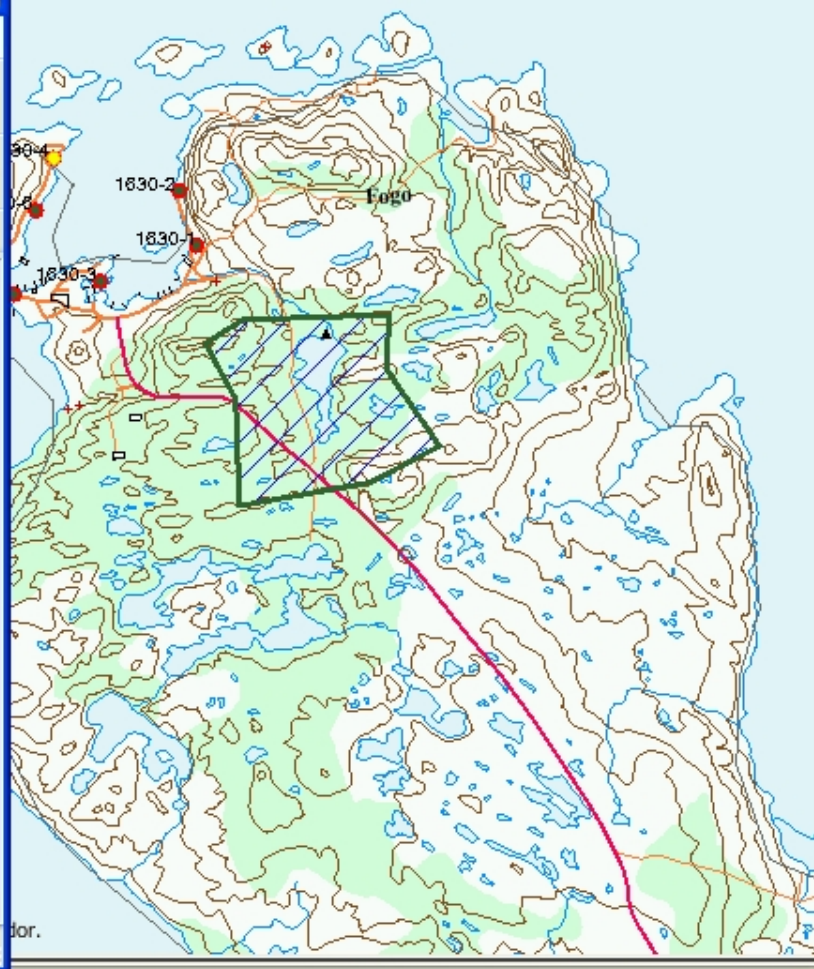
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Address http://www.wrmd.env.gov.nl.ca/sewageoutfalls/Documents/1630-4_DCP_1 Go

Links [ENV GIS App](#) [WRMD INTRANET](#) [Google](#) [Gov Mail](#) [MS Knowledge Base](#)

Done Internet

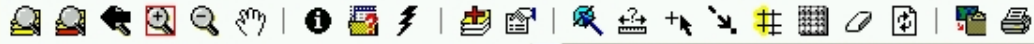


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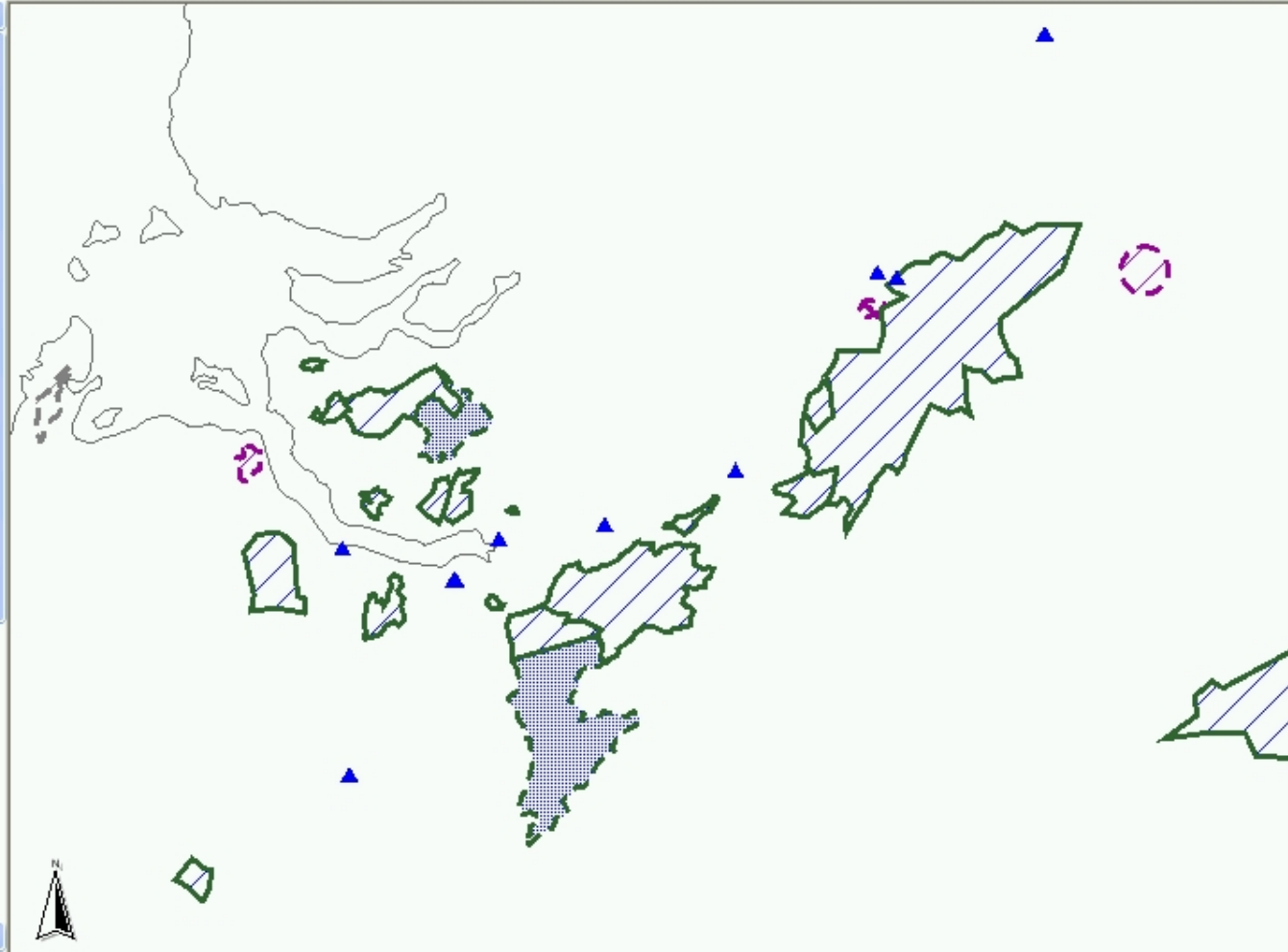
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Map Layers

- | Visible | Active | | |
|-------------------------------------|-------------------------------------|-----------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | NTS50 Grid | |
| <input type="checkbox"/> | <input type="checkbox"/> | Photos | |
| <input type="checkbox"/> | <input type="checkbox"/> | Communities | |
| <input type="checkbox"/> | <input type="checkbox"/> | Climate Stations | |
| <input type="checkbox"/> | <input type="checkbox"/> | Hydrometric Stations | |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | WQMA Stations | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Intakes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Potential_Intakes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Protected_Intakes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Unprotected_Intakes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Wellheads | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Potential_Wellheads | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Protected_Wellheads | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Unprotected_Wellheads | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Diversion_Pipes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Potential_Diversion_Pipes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Protected_Diversion_Pipes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Unprotected_Diversion_Pipes | ◆ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ILUC_Legal_Boundaries | |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Protected_Legal_Boundaries | |



Map Tool: **Zoom In**

Scale RF 1 : 585763

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Search Results

WQMA Stations (1 records selected)

STATION_NUM: NF02YL0012

STATION_NAME: Humber River @
Humber Village Bridge

STATION_TYPE: Real Time

STATUS: Ongoing

SAMPLING_AGENCY: Provincial

SAMPLING_FREQUENCY: 6

START_DATE: 8/5/1986

REGION: Western

WSC_STATION: 02YL003

LATITUDE: 48.98361

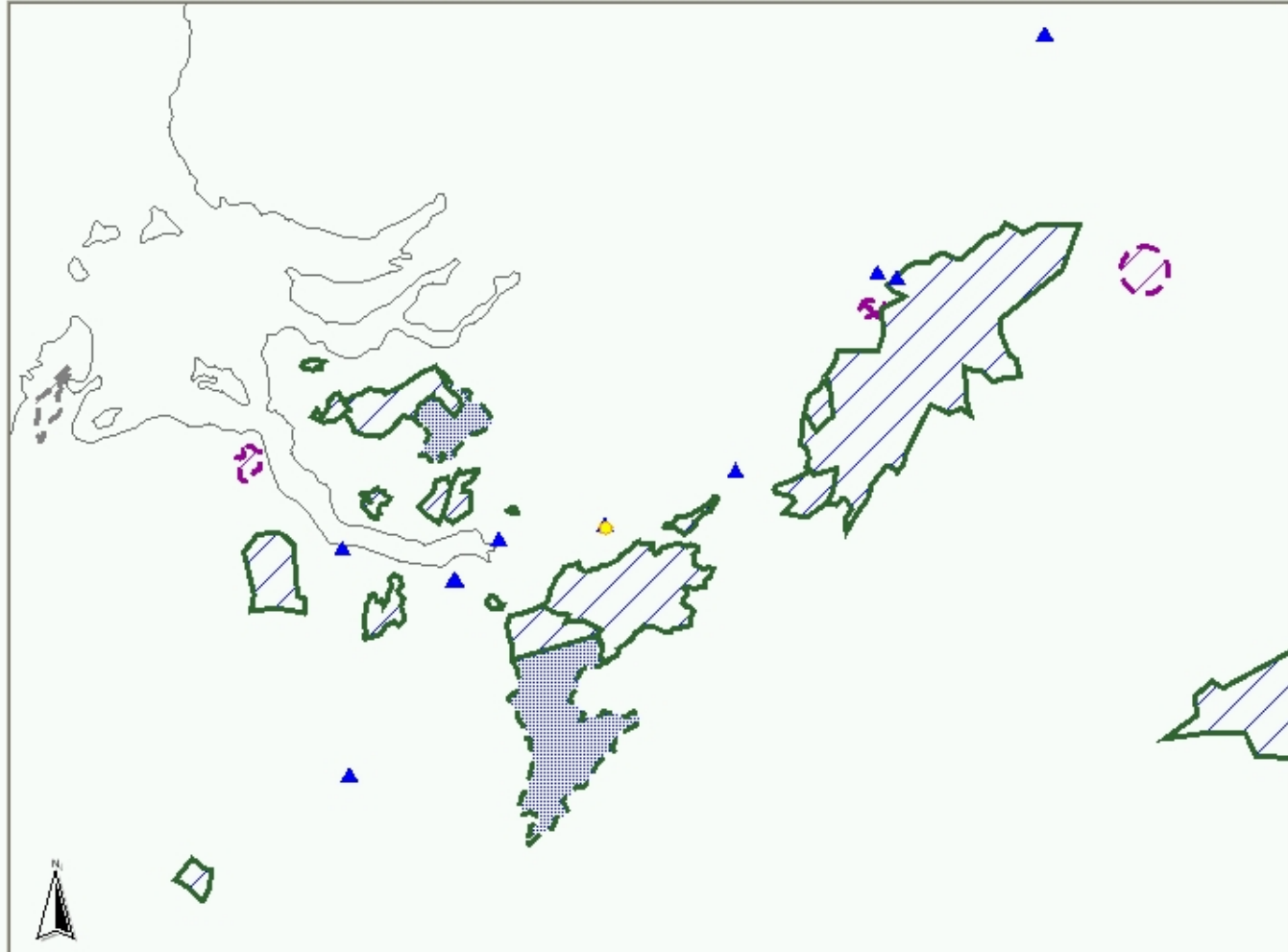
LONGITUDE: -57.76111

CANAL_LINK: [Hyperlink](#)

REALTIME_LINK: [Hyperlink](#)

CHEMICAL: Y

BACTERIOLOGICAL: Y



0 15.23km
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Map Tool: Identify

Scale RF 1 : 585763

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Search Results

WQMA Stations (1 records selected)

STATION_NUM: NF02YL0012

STATION_NAME: Humber River @
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STATION_TYPE: Real Time

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SAMPLING_AGENCY: Provincial

SAMPLING_FREQUENCY: 6

START_DATE: 8/5/1986

REGION: Western

WSC_STATION: 02YL003

LATITUDE: 48.98361

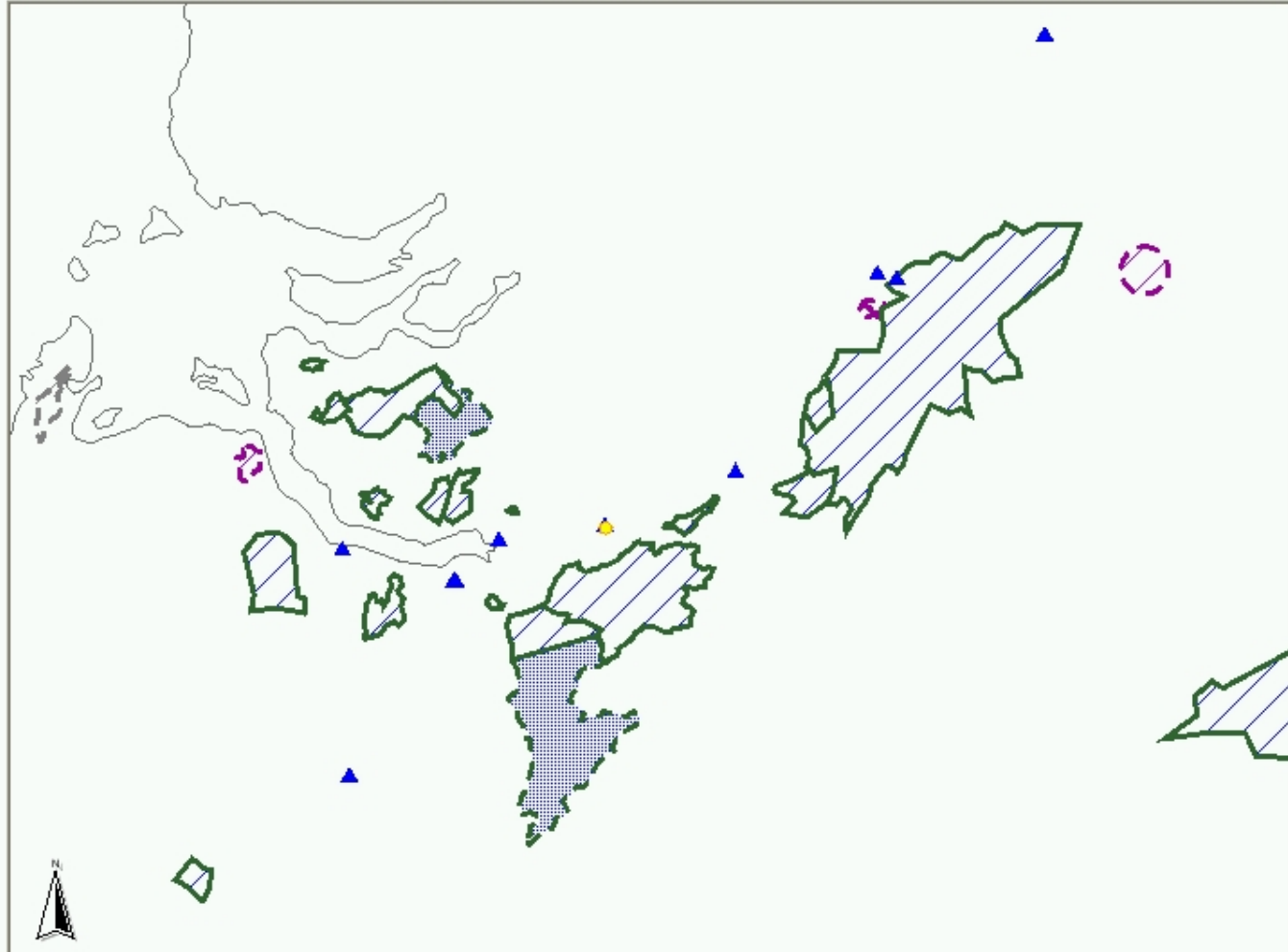
LONGITUDE: -57.76111

CANAL_LINK: [Hyperlink](#)

REALTIME_LINK: [Hyperlink](#)

CHEMICAL: Y

BACTERIOLOGICAL: Y



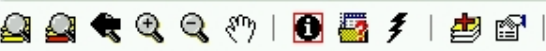
0 15.23km

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Map Tool: Identify

Scale RF 1 : 585763

Layers Layer Groupings Legend Key Map



Search Results

WQMA Stations (1 records selected)

STATION_NUM: NF02YL0012

STATION_NAME: Humber River @ Humber Village Bridge

STATION_TYPE: Real Time

STATUS: Ongoing

SAMPLING_AGENCY: Provincial

SAMPLING_FREQUENCY: 6

START_DATE: 8/5/1986

REGION: Western

WSC_STATION: 02YL003

LATITUDE: 48.98361

LONGITUDE: -57.76111

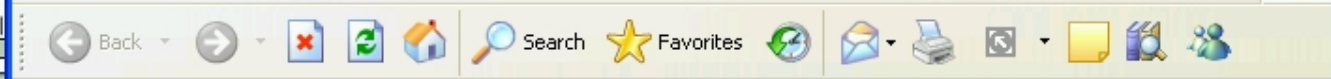
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REALTIME_LINK: [Hyperlink](#)

CHEMICAL: Y

BACTERIOLOGICAL: Y

Map Tool: **Identify** Scale RF 1 : 585763



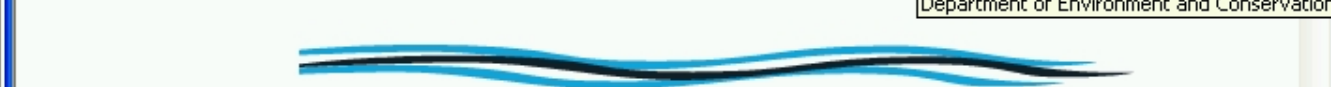
Address http://www.canal.gov.nl.ca/canal/root/main/station_details_e.asp?envirodat=NF02YL0012 Go

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Department of Environment and Conservation



- CANAL**
- Station Profile**
 - View Bacteria**
 - View WQI**
 - View Fact Sheet**
 - Real Time Data**

Water Quality Station Profile

Station #: NF02YL0012, Humber River @ Humber Village Bridge
Latitude: 48.9836 N, **Longitude:** 57.7611 W

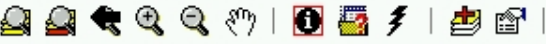
- Environment Canada's Water Quality Database
- Extract Data**
 - View Chemistry**



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Layers Layer Groupings Legend Key Map



Search Results

WQMA Stations (1 records selected)

STATION_NUM: NF02YL0012

STATION_NAME: Humber River @
Humber Village Bridge

STATION_TYPE: Real Time

STATUS: Ongoing

SAMPLING_AGENCY: Provincial

SAMPLING_FREQUENCY: 6

START_DATE: 8/5/1986

REGION: Western

WSC_STATION: 02YL003

LATITUDE: 48.98361

LONGITUDE: -57.76111

CANAL_LINK: [Hyperlink](#)

REALTIME_LINK: [Hyperlink](#)

CHEMICAL: Y

BACTERIOLOGICAL: Y

Map Tool: **Identify** Scale RF 1 : 585763

48°37'43.3" North 58°27'7.7" West UTM Zone: 21 392999 East 5387199 North

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Address http://www.canal.gov.nl.ca/canal/root/main/station_details_e.asp?envirodat=NF02YL0012 Go

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Range mountains, through a series of pools and steadies surrounded by extensive boreal forest. It then flows through a deep and heavily forested river valley into a wide flood plane between Adies Lake and

EcoRegion: Western Newfoundland Forest- Corner Brook Subregion

Long Range Barrens- Northern Long Range Subregion, Buchans Plateau-Topsail Subregion

Central Newfoundland Forest- Northcentral Subregion

Northern Peninsula Forest- Eastern Long Range Subregion;

Elevation: 7 m	Basin: 02YL
Agency: Provincial	Start Date: 8/5/1986
Current Status: Active	Sampling Frequency: 6

Mean Spring Temp: 0 DegC	Mean Summer Temp: 13 DegC
Mean Fall Temp: 6 DegC	Mean Winter Temp: -7 DegC
Mean Annual Precip: 1100 mm	Mean Annual Runoff: 1050 mm

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Layers Layer Groupings Legend Key Map



Search Results

WQMA Stations (1 records selected)

STATION_NUM: NF02YL0012

STATION_NAME: Humber River @
Humber Village Bridge

STATION_TYPE: Real Time

STATUS: Ongoing

SAMPLING_AGENCY: Provincial

SAMPLING_FREQUENCY: 6

START_DATE: 8/5/1986

REGION: Western

WSC_STATION: 02YL003

LATITUDE: 48.98361

LONGITUDE: -57.76111

CANAL_LINK: [Hyperlink](#)

REALTIME_LINK: [Hyperlink](#)

CHEMICAL: Y

BACTERIOLOGICAL: Y

Map Tool: **Identify** Scale RF 1 : 585763

49°4'31.8" North 58°23'33.5" West UTM Zone: 21 398292 East 5436783 North

File Edit View Favorites Tools Help

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Address http://www.env.gov.nl.ca/wrmd/ADRS/v6/Template_Station.asp?station=NF02YL0012 Go

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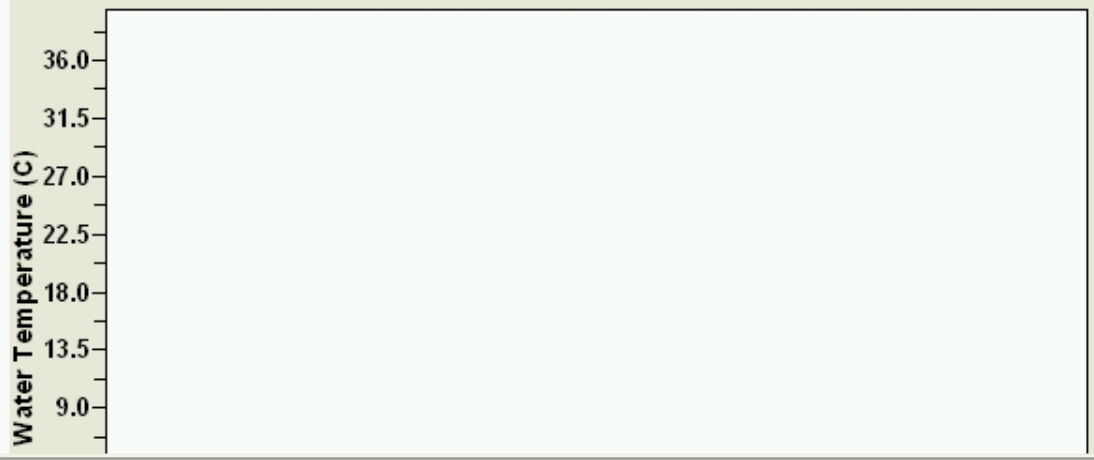
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Near-Real Time Data

Due to the volume and frequent updating of the data available on this Web site the streamflow and water quality data is PROVISIONAL and has not undergone quality control checks. These data may be subject to significant change.

Humber River At Humber Village Bridge - NF02YL0012

Department of Environment & Conservation Water Resources Management Division



(4 items remaining) Downloading picture http://www.env.gov.nl/ [Progress Bar] Unknown Zone

Layers Layer Groupings Legend Key Map

Map navigation icons: Home, Back, Forward, Stop, Refresh, Print, Search, etc.

Search Results

WQMA Stations (1 records selected)

STATION_NUM: NF02YL0012

STATION_NAME: Humber River @ Humber Village Bridge

STATION_TYPE: Real Time

STATUS: Ongoing

SAMPLING_AGENCY: Provincial

SAMPLING_FREQUENCY: 6

START_DATE: 8/5/1986

REGION: Western

WSC_STATION: 02YL003

LATITUDE: 48.98361

LONGITUDE: -57.76111

CANAL_LINK: [Hyperlink](#)

REALTIME_LINK: [Hyperlink](#)

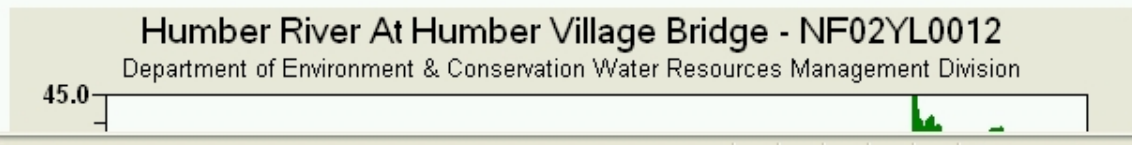
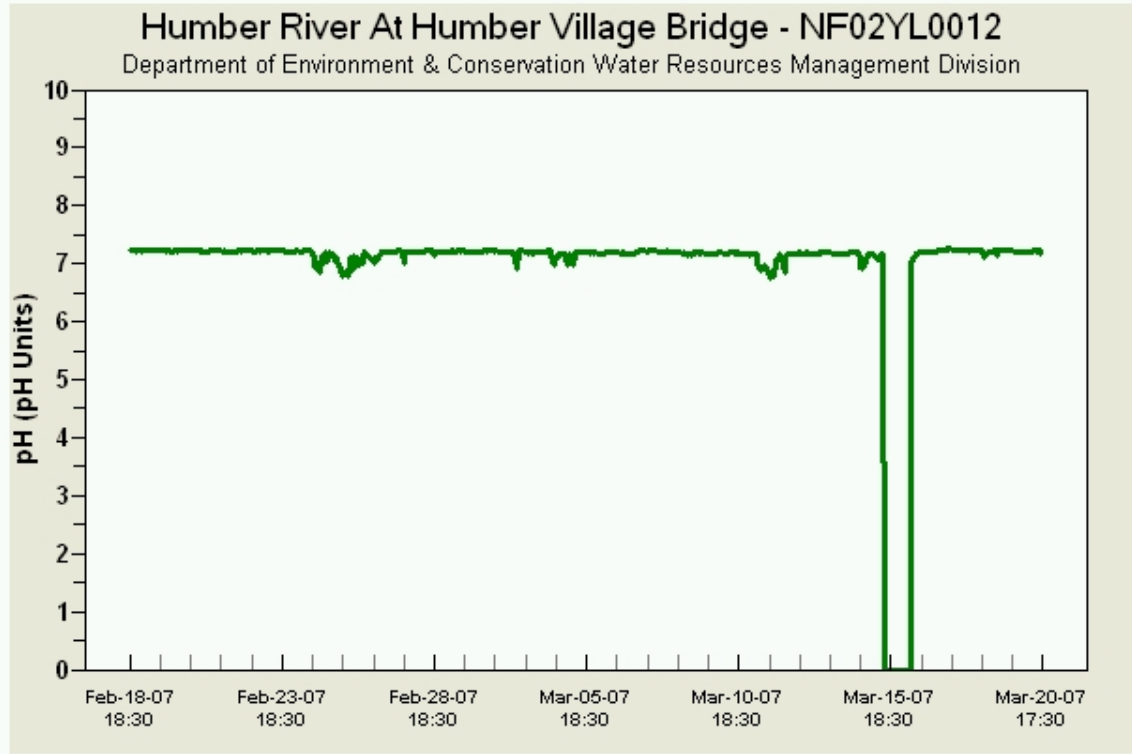
CHEMICAL: Y

BACTERIOLOGICAL: Y

File Edit View Favorites Tools Help

Address: http://www.env.gov.nl.ca/wrmd/ADRS/v6/Template_Station.asp?station=NF02YL0012

Links: ENV GIS App, WRMD INTRANET, Google, Gov Mail, MS Knowledge Base, Weather, WRMD



Map Tool: Identify Scale RF 1 : 585763

Error on page.

Timely access to and presentation of accurate information in its proper context and in a visual format is critical for effective Emergency Response

http://www.env.gov.nl.ca/env/Env/water_resources.asp

Thank You