

TABLE of CONTENTS

INTRODUCTION	1
ACKNOWLEDGING DATA OWNERS	3
DATA WAREHOUSE INSTALLATION	5
SPATIAL DATA	8
TABULAR DATA	15

INTRODUCTION

The purpose of this document is to provide an overview of the custom ArcMap project or map document developed for accessing the NB Aquatic Data Warehouse. The 2006 version was created in ArcMap version 9.1. This document does not provide instructions on using the software; it is assumed readers are familiar with ArcMap GIS.

The Data Warehouse ArcMap project provides convenient access to both the spatial and tabular data within the Data Warehouse. However, access is view only; if errors or omissions are found, please contact Faye Cowie at (506) 365-8927 or ardw@nbnet.nb.ca. Data Warehouse installations are generally updated annually or biannually.

The NB Aquatic Data Warehouse is a cooperative initiative between government, the University of New Brunswick, the private sector, conservation organizations and community-based organizations. The following organizations have contributed data and/or funding:

Principal Partners

NB Department of Natural Resources N B Department of Environment Fisheries and Oceans Canada University of New Brunswick

Industry

Bowater Pulp and Paper Canada Inc.
J. D. Irving, Limited
Fraser Papers Ltd.
Washburn & Gillis

Municipalities

Village of Belledune

Funding Programs

NB Environmental Trust Fund NB Wildlife Trust Fund

Environmental and Conservation Organizations

Atlantic Salmon Federation Cains River Enhancement Association Eastern Charlotte Waterways Fredericton Fish & Game Fundy Model Forest Hammond River Anglers Association Kennebecasis River Watershed Restoration Comm. Kent County Anglers Association **Keswick River Society** Le Club Chasse et Pêche Grande Rivière Tracadie Meduxnekeag River Association Miramichi Headwaters Salmon Federation Miramichi Salmon Association Nepisiguit Salmon Association Oromocto First Nation Shepody Rivers Enhancement Association Southeastern Anglers Association Sussex Fish and Game Association Tri-Rivers Association

Field data contributed to the NB Aquatic Data Warehouse by Bowater Pulp and Paper Canada Inc. and J.D. Irving Limited are not distributed with the NB Aquatic Data Warehouse ArcMap project and data. However, all sampling sites are included in the spatial files. Please contact the company representative's below to request copies of their data:

Manley Price Bowater Pulp and Paper Canada Inc. Boiestown, New Brunswick (506) 369-2479 John Gilbert J. D. Irving, Limited Saint John, New Brunswick (506) 632-7777

ACKNOWLEDGING DATA OWNERS

The NB Aquatic Data Warehouse is a repository of data compiled from many sources. As such, it is important to acknowledge the source(s) of data when producing maps, reports or other products.

Refer to the Spatial Data section of this document to determine the source of the geospatial data. Each record in time series or tabular data generally contains an agency code field. Refer to Table 1 below to translate the codes into agency names. Contact and/or address information is not available at this time.

Table 1. List of agencies who have contributed data to the NB Aquatic Data Warehouse.

AGENCY CODE	AGENCY
ASF	Atlantic Salmon Federation
BELL	Village of Belledune
BOWR	Bowater Pulp and Paper Canada Inc.
CAIN	Cains River Enhancement Assocation
CPGT	Le Club Chasse et Pêche Grande Rivière Tracadie
DELG	NB Dept of Environment & Local Government
DFO	Fisheries and Oceans Canada
DNR	NB Dept. of Natural Resources
ECW	Eastern Charlotte Waterways Inc.
FFGA	Fredericton Fish and Game Association
FRAS	Frasers Papers Ltd.
FRB	Fisheries Research Board
HBRI	Hill Brothers Inc.
HRAA	Hammond River Angling Association
IRVG	J.D. Irving Limited
KCAS	Kent County Anglers Assocation
KRS	Keswick River Society
KWRC	Kennebecasis River Watershed Restoration Committee
MHSF	Miramichi Headwaters Salmon Federation
MSA	Miramichi Salmon Association
NBADW	NB Aquatic Data Warehouse
NSA	Nepisiguit Salmon Association
OFN	Oromocto First Nation
SFGA	Sussex Fish & Game Association

AGENCY CODE	AGENCY		
SNB	Service New Brunswick		
SREA	Shepody Rivers Enhancement Association		
TRIV	Tri-Rivers Association		
UNK	Unknown		
WAGI	Washburn & Gillis		

DATA WAREHOUSE INSTALLATION

The NB Aquatic Data Warehouse files are generally installed on a server to provide multi-user access within an organization. Alternatively, it can be installed on a stand alone PC. The installation disk contains the folders and subfolders as described below; this arrangement should not be changed once installed.

All of the Data Warehouse files are stored in one main folder (Data_Warehouse) which contains subfolders for the ArcMap project, documentation, spatial data and tabular data. Typically the Data_Warehouse folder and its subfolders are installed in the root directory of the hard drive. See Table 2 on next page.

Table 2. Folder and subfolder structure for the NB Aquatic Data Warehouse.

FOLDER	SUBFOLDER	SUBFOLDER	SUBFOLDER	CONTENTS
Data_Warehouse	ArcMap			Data Warehouse ArcMap project
	Documents	Data Collection Forms		Standard data collection forms in PDF format
		DW Manual		Data Warehouse Manual Version 3.0
				Draft version of the Data Warehouse Access Manual Version 4.0 ArcMap Project Documentation
		Other Agencies	DNR	Documentation associated with DNR data
		Other Agencies		
			ESAs	Scanned excerpts from the Environmentally Significant Areas final report
			ETB	Service New Brunswick's DTDB 1998 User Guide
	Spatial_Data	DTDB		Shape files of Service New Brunswick's DTDB hydrographic and road data. SNB's hydrographic layer was separated into multiple layers to represent each type of hydrographic feature, e.g. lakes, streams, rivers, etc.
		DW_Shapes		Shape files of GIS data the Data Warehouse manages
			Lake_Stream_Surveys	Shape files of stream route event data associated with lake and stream surveys, e.g. habitat units, surveyed lakes, surveyed streams
			Regulated_Waters	Shape files of stream route event data associated with angling regulations, e.g. angling leases, Crown reserves, long tern closed waters
		Other_Shapes	Administrative Boundaries	Shape files of administrative boundaries from SNB, DNR and DOE, e.g. counties, parishes, forest licenses, municipalities
			Ecological Land Classification	Shape files of ecological regions, districts, sections, plus environmentally significant areas
			Fisheries	Shape files of SNB's limits of inland fisheries and DNR's recreational fisheries management areas
			Geology	Shape file of DNR's bedrock geology

FOLDER	SUBFOLDER	SUBFOLDER	SUBFOLDER	CONTENTS
			Land_Ownership	Shape files of SNB's Crown land, First Nation lands, and submerged land management areas, plus DNR's major landowners
			Land_Water_Use	Shape files of major dams from the Canadian Dam Association, plus SNB's federal and provincial parks, municipal areas and military base
			Map_Grids	Shape files of 1:10,000 and 1:50.000 map grids from DNR
			Other_Roads	Shape file of NR Canada's major roads
			Other_Watersheds	Shape file of Maine's watersheds
			Place_Names	Shape file of NR Canada's place names – only installed if organization has a license to use
			Protected_Areas	Shape files of DNR's Protected Natural Areas and DOE's drinking water supply watersheds and wellfields
			Province_State	Shape files of SNB's provincial outline, plus ESRI's Canadian provinces and US states
			Water_Monitoring	Shape files of DOE's groundwater level monitoring stations and Environment Canada's hydrometric stations
		Stream_Routes	One folder per basin	ArcInfo route systems of the major lakes and streams - used for displaying event data. One route system per basin
	Tabular_Data			Microsoft Access database of tabular data

SPATIAL DATA

The ArcMap project presents the spatial data layers grouped by categories. Clicking on the plus sign beside a category will expand the group to display the list of layers it contains. The following table presents the categories, the layers each contains, plus a description of each layer.

Note the Data Warehouse stores all data collection sites in one shape file called Aquatic_Sites. Specific types of sites, such as water temperature monitoring, electrofishing, or fish counting sites are displayed by joining site tables (query tables) to the layer and querying for specific instances (see Tabular Data).

Table 3. Descriptions of data layers within each data category as presented in the NB Aquatic Data Warehouse ArcMap project.

GROUP	LAYER	DESCRIPTION	SCALE DEPENDENT	SOURCE *	TIME PERIOD OR LAST UPDATE	REFERENCES
	Water Body IDs	Unique lake and stream identifiers	Yes	NBADW	2002	DW Manual: Water Resource Inventory
Water Body Identification	Water Body Names	Lake and stream names	Yes	NBADW	2002	DW Manual: Water Resource Inventory
	Stream Order	Stream junctions where stream order changes (Strahler method)	Yes	NBADW	2002	DW Manual: Water Resource Inventory
Index Maps	1:50,000 Index	Boundaries of 1:50,000 scale National Topographic Series (NTS) maps		DNR	2002	
macx maps	1:10,000 Index	Boundaries of 1:10,000 scale map tiles used by NB Department of Natural Resources	Yes	DNR	2002	
	Water Temperature Monitoring Sites	Locations where electronic water temperature data loggers have been installed by various agencies. Other sites may exist which are not included in this layer.		NBADW	1994-Mar-03 - 2004-Nov-21	DW Manual: Water Quality - Temperatures
	Water Chemistry Sites	Locations of water chemistry sample sites. This layer is not complete; many sites exist.		NBADW		
Water Monitoring	Groundwater Monitoring Stations	Real time groundwater level monitoring stations managed by DELG and Environment Canada		DELG/ Env Canada	2003	
	Hydrometric Stations	Surface water flow monitoring stations managed by DELG and Environment Canada		DELG / Env. Canada	2000	Metadata: http://geogratis.cgdi.gc.ca/download/f rameworkdata/hydrology/analytical/dr ainage_supplemental/gauging_statio ns/en_gauge_metadata.xml
Fish Populations	Electrofishing Sites	Locations where electrofishing population assessments have occurred. Other sites may exist which are not included in this layer.		NBADW	1950-Sep-26 – 2003-Sept-09	DW Manual: Fish Populations – Streams
	Fish Counting Facilities	Locations of fish counting facilities operated by DNR, DFO and others. Includes barriers, counting fences, fishways, smolt wheels, and trap nets.		NBADW	1954-May-31 - 2004-Jun-09	DW Manual: Fish Populations - Streams
	Fish Stocking Sites	Locations where fish stocking has occurred		NBADW	1997 - 2001	DW Manual: Management – Stockings

GROUP	LAYER	DESCRIPTION	SCALE DEPENDENT	SOURCE *	TIME PERIOD OR LAST UPDATE	REFERENCES
	Stocked Waters	Bodies of waters which have been stocked with fish between 1954 and the present		NBADW	1954 – 2004-Jun-09	DW Manual: Management – Stockings
	Groundwater Temperatures	Stream survey data: Habitat units where groundwater temperatures (?C) were recorded Other stream survey data may exist which are not included in this layer.		NBADW	1994-Jun-08 - 2001-Aug-08	DW Manual: Habitat Assessment - Streams
	Stream Temperatures	Stream survey data: Habitat units where survey stream temperatures (?C) were recorded. Other stream survey data may exist which are not included in this layer.		NBADW	1994-Jun-08 - 2001-Aug-08	DW Manual: Habitat Assessment - Streams
	Brook Trout Habitat - % of Overhanging Vegetation on Runs and Pools	Stream survey data: Runs and pools with ranges of overhanging vegetation. Other stream survey data may exist which are not included in this layer.		NBADW	1994-Jun-08 - 2001-Aug-08	DW Manual: Habitat Assessment - Streams
	Adult Salmon Habitat - Depth of Pools with Large Substrate	Stream survey data: Depth ranges of pools with 30% or more large substrate. Other stream survey data may exist which are not included in this layer.		NBADW	1994-Jun-08 - 2001-Aug-08	DW Manual: Habitat Assessment - Streams
Lake & Stream Surveys	Juvenile Salmon Habitat - Riffle Types	Stream survey data: Locations of rock/boulder riffles, gravel/rubble riffles and sand substrate riffles. Other stream survey data may exist which are not included in this layer.		NBADW	1994-Jun-08 - 2001-Aug-08	DW Manual: Habitat Assessment - Streams
	Stream Types	Stream survey data: Locations of each stream type group: riffle, run, pool, rapids, and other. Other stream survey data may exist which are not included in this layer.		NBADW	1994-Jun-08 - 2001-Aug-08	DW Manual: Habitat Assessment - Streams
	Lake Depths (m)	Depth measurement points on surveyed lakes. Depths are recorded in meters.		DNR / NBADW	1958-Aug-17 - 1998-Sep-13	DW Manual: Habitat Assessment – Lakes
	Surveyed Streams	Stretches of streams which have been surveyed. Other streams may have been surveyed which are not included in this layer.		NBADW	1994-Jun-08 - 2001-Aug-08	DW Manual: Habitat Assessment - Streams
	Surveyed Lakes	Lakes which have been surveyed. Other lakes may have been surveyed which are not included in this layer.		DNR / NBADW	1958-Aug-17 - 1998-Sep-13	DW Manual: Habitat Assessment – Lakes

GROUP	LAYER	DESCRIPTION	SCALE DEPENDENT	SOURCE *	TIME PERIOD OR LAST UPDATE	REFERENCES
	Angling Leases	Stretches of rivers and lakes associated with angling leases		DNR / NBADW	2005-Feb	DW Manual: Management – Regulated Waters
	Crown Reserves	Stretches of rivers and lakes assigned to regular, live release and daily Crown reserves		DNR / NBADW	2005-Feb	DW Manual: Management – Regulated Waters
Demilated	Designated Angling Waters	Stretches of rivers where non-resident anglers require a NB guide		DNR / NBADW	2005-Feb	DW Manual: Management – Regulated Waters
Regulated Angling Waters	Scheduled Waters	Stretches of rivers which are fly fishing only		DNR / NBADW	2005-Feb	DW Manual: Management – Regulated Waters
	Long Term Closed Waters	Stretches of rivers and lakes which are closed during the angling season. These are long term closures. Be aware that additional waters may be closed throughout the angling season due to adverse environmental circumstances. Contact DFO for more information.		DNR / NBADW	2005-Feb	DW Manual: Management – Regulated Waters
Roads	Major Roads	New Brunswick's primary roads		NR Canada	2003	Metadata: http://geogratis.cgdi.gc.ca/download/frameworkdata/roads/enroadsmetadata.xml
	All Roads	Service New Brunswick's roads and trails	Yes	SNB	2001-Mar-06	DTDB98 User Guide
Lakes and Streams	Primary Lakes & Streams	Center lines of major rivers and shoreline of major lakes.		SNB / NBADW	2005-Feb-02	DW Manual: Water Resource Inventory
	Lakes	Service New Brunswick's lake polygons (greater that 1.0 ha) with additional attributes assigned by NBADW. Smaller lakes or ponds may exist.	Yes	SNB / NBADW	2004-Jul-26	DTDB98 User Guide DW Manual: Water Resource Inventory
	Rivers	Sections of rivers with left and right banks digitized (generally greater than 10 m wide). Service New Brunswick data.	Yes	SNB	2001-Mar-06	DTDB98 User Guide
	Streams	Service New Brunswick's streams digitized as a single line (generally less than 10 m in width). Includes virtual lines through open water to maintain a stream network	Yes	SNB	2001-Mar-06	DTDB98 User Guide

GROUP	LAYER	DESCRIPTION	SCALE DEPENDENT	SOURCE *	TIME PERIOD OR LAST UPDATE	REFERENCES
		Constal factors and a constal manch of		CNID /		DTDB98 User Guide
	Coastal Features	Coastal features such as coastal marshes, dunes, and ordinary high water mark.	Yes	SNB / NBADW	2001-Jul-30	DW Manual: Water Resource Inventory
	Designated Surface Drinking Water Supply Watersheds	Municipal surface water drinking water supplies and associated protective zones		DELG	2002	DELG Website: http://www.gnb.ca/0009/0371/0004
Protected Areas	Designated Well Field Protection Areas	Municipal groundwater drinking water supplies and associated protective buffers		DELG	2005-Jan-01	DELG Website: http://www.gnb.ca/0009/0371/0001
	Protected Natural Areas	Protected Natural Areas as managed by DNR		DNR	2005-Mar	DNR Website: http://www.gnb.ca/0399/index-e.asp
	Major Dams	Dams of 15 meters or more measured from the lowest portion of the foundation to the crest. Dams between 10 and 15 meters may be included if certain conditions apply. Smaller dams exist in New Brunswick, but are presented in this layer.		Canadian Dams Association / NBADW	2005-Jan-21	Canadian Dams Association Website: http://www.cda.ca
Land & Water	Business Improvement Areas	Twenty-eight provincial business improvement areas		SNB	2004 Mar 14	https://www.web11.snb.ca/snb7001/e /2000/2900e_1e_i.asp
Use	Federal Parks	NB's national parks (2)		SNB	2004 Mar 14	https://www.web11.snb.ca/snb7001/e /2000/2900e_1e_i.asp
	Provincial Parks	Provincial parks managed by NB Dept of Natural Resources		SNB	2004 Mar 14	https://www.web11.snb.ca/snb7001/e /2000/2900e 1e i.asp
	Municipal Areas	104 municipalities including 8 cities, 26 towns, 69 villages and 1 rural community		SNB	2004 Mar 14	https://www.web11.snb.ca/snb7001/e /2000/2900e_1e_i.asp
	Military Bases	CFB Gagetown military base		SNB	2004 Mar 14	https://www.web11.snb.ca/snb7001/e /2000/2900e_1e_i.asp
Land Ownership	First Nation Lands	Land parcels occupied by NB's First Nations		SNB	2004 Mar 14	
Ownership	Crown Land	Land owned by the Province of New Brunswick		SNB	2004 Mar 14	
	Major Landowners by Owner	Industrial land owners as defined by NB Department of Natural Resources for forest management purposes.		DNR	2005-Feb	

GROUP	LAYER	DESCRIPTION	SCALE DEPENDENT	SOURCE *	TIME PERIOD OR LAST UPDATE	REFERENCES
	Major Landowners by Owner Group	Industrial land owners as defined by NB Department of Natural Resources for forest management purposes.		DNR	2005-Feb	
	Submerged Land Management Areas	Submerged land in the Bay of Fundy and Northumberland Strait owned by the Crown		SNB	2004 Mar 14	
	Environmentally Significant Areas	Environmentally significant areas represented as points as defined by the Nature Trust of NB. The positional accuracy of this data cannot be guaranteed.		Nature Trust / DELG	1995-Mar	Environmentally Significant Areas in New Brunswick – Preliminary Listing
	Ecological Sections	Subsections of ecological districts	Yes	DNR	1999-Jul	DNR Website: http://www.gnb.ca/0263/landclass- e.asp
Ecological Classification	Ecological Districts	Subsections of ecological regions		DNR	1999-Jul	Ecological Classification Code Tables DNR Website: http://www.gnb.ca/0263/landclass-e.asp Ecological Classification Code Tables
	Ecological Regions	Regions of New Brunswick with similar climate, geology and elevation		DNR	1999-Jul	DNR Website: http://www.gnb.ca/0263/landclass- e.asp Ecological Classification Code Tables
Geology	Bedrock Geology	New Brunswick's bedrock geology		DNR	2001-Nov	DNR Documents: http://linux.unb.ca/NB.waters/otherdo cs/NR1Polygons.xls http://linux.unb.ca/NB.waters/otherdo cs/nr-1e.pdf
Administrative Boundaries	Limits of Inland Fisheries	Limits of inland fisheries on 73 streams		SNB	2004 Mar 14	
	Parishes	Parish boundaries		DNR	2002	
	Counties	County boundaries		DNR	2002	
	DNR Regions	Administrative boundaries of DNR's regions		DNR	2004-June	
	DELG Regions	Administrative boundaries of DELG's regions		DELG	2004	

GROUP	LAYER	DESCRIPTION	SCALE DEPENDENT	SOURCE *	TIME PERIOD OR LAST UPDATE	REFERENCES
	Recreational Fishery Areas	Recreational fisheries management areas as defined by NB Dept of Natural Resources		DNR		
	Forest Licenses	Boundaries of licenses for Crown owned timber		DNR	2003-Mar	
	Local Service Districts	Two-hundred and sixty-nine (269) provincial local service districts		SNB	2004 Mar 14	
	District Planning Commissions	Twelve (12) provincial district planning com		SNB	2004 Mar 14	
	Federal Electoral Districts	Boundaries of NB's 10 federal electoral districts		SNB	2004 Mar 14	
	Provincial Electoral Districts	Fifty-five (55) provincial electoral ridings		SNB	2004 Mar 14	
	Tax Authorities	Three-hundred and seventy-eight (378) provincial taxation authorities		SNB	2004 Mar 14	
	2 nd Level Watersheds	Catchment areas of the 5 th order and higher streams, plus composites of the 13 major drainage basins		NBADW	2003-Mar-07	DW Manual: Drainage System
Watersheds	Watershed Units	Catchment areas of NB's 446 drainage units	Yes	NBADW	2003-Mar-07	DW Manual: Drainage System
	1 st Level Watersheds	Catchment areas of NB's 13 major drainage basins				
	Basins	Catchment areas of NB's 13 major drainage basins		NBADW	2003-Mar-07	DW Manual: Drainage System
	U.S. States	Boundaries of U.S. states and territories		ESRI		
Provinces & U.S. States	Provinces	Boundaries of Canadian provinces and territories		ESRI		
	Provincial Outline	Outline of the province		SNB	2004 Mar 14	

TABULAR DATA

Time series field data and other data stored in the NB Aquatic Data Warehouse Access database is linked to the spatial data by joining and/or relating the Access tables or ArcMap's query tables to the spatial layer. The list of tables added to the ArcMap project can be viewed by clicking on the Source tab below the map document's table of contents. Access tables added directly to the map document begin with "tbl" while the query tables created with ArcMap's Toolbox (Data Management Tools -> Layers and Table Views -> Make Query Table tool) begin with "qry". The Make Query Table tool allows multiple Access tables to queried and presented as a single table.

Table 4 below presents the layers that have joined and/or related data tables. Joined data is viewed when a layer's attribute table is opened. Related tables indicated a one to many relationship meaning for each feature in the layer, there may be more than one associated record in the related table. For instance, a fish counting facility will have many daily count records associated with a single site – one site: many fish count records. To view related tables, open the layer's attribute table. Click options at the bottom of the attribute table window, then move the mouse to Related Tables (in the Options menu). If the layer has related tables, they will appear as a submenu. Click on the desired table. If one or more spatial features are selected in the layer, the associated records in the related table are also selected or highlighted.

Table 4. Data layers with related data tables.

CATEGORY	LAYER	RELATED TABLES
Water Monitoring	Water Temperature Monitoring Sites	WaterTemperatures - Field water measurements and derived measurements, such as instantaneous water temperature, minimum, maximum and average daily water temperatures,
	Water Chemistry Sites	Water Chemistry Results – Provides NB Dept, of Environment lab no. Actual data should be obtained from DENV
Fish Populations		ElectrofishingData - Sweep data associated with electrofishing activities
	Electrofishing Sites	ElectrofishingMarkRecaptureData - Mark and recapture data associated with this type of electrofishing activity
		ElectrofishingPopulationEstimates - Population estimates derived from electrofishing field data. Contains different types of estimates depending on the methods and formulas used
		ElectrofishingSurveys – Electro fishing event details
	Fish Counting Facilities	FishRunCounts - Daily fish counts at fish counting facilities such as barriers, counting fences, smolt wheels and trap nets
	Fish Stocking Sites	StockedFish – Species, stock, number of fish, average length and weight, markings and source of fish

15

CATEGORY	LAYER	RELATED TABLES
		stocked at specific sites
	Stocked Waters	StockedFish - Number of fish, stock, average length and weight, markings and source of fish stocked in bodies of water
Surveyed Lakes and Streams	Surveyed Streams	HabitatUnits – Field data describing each habitat unit in surveyed streams
		HabitatUnitObservations – Field observations associated with habitat units
		HabitatUnitWaterMeasurements – Water temperature and flow measurements of surveyed streams and/or groundwater sources
	Surveyed Lakes	LakeSurveyDetails – Physical characteristics of the lake using DNR's lake survey method
		LakeSurveyWaterMeasurements – Temperature, DO, and other chemical parameters measured in the fleld
		LakeSurveyTribAssessment – Spawning and nursery potential of lake tributaries
		LakeSurveyFishPresent – Fish species present in the lake
Angling Regulations	Angling Leases	Sportfishing - Brook trout and Atlantic salmon catch and effort on NB's angling leases
	Crown Reserves	Sportfishing - Brook trout and Atlantic salmon catch and effort on NB's Crown reserves