CHAPTER 9

RIVER CLASSIFICATION PROGRAM

This data set relates specifically to the New Brunswick Department of the Environment's River Classification Program. The program's purpose is to support a new initiative, under *The Clean Water Act,* which will address the protection and management of New Brunswick's surface waters. A discussion paper has been prepared to provide an overview of the River Classification Program, and to introduce the concept of public nomination and management of a class of outstanding waters.

In anticipation of this new legislation, the River Classification Program has been collecting information on selected New Brunswick waters to illustrate the criteria that might be used within the nomination process.

By surveying individuals who are familiar with the lakes and streams in their areas (such as the Department of Natural Resources and Energy's regional biologists), NB Environment drafted a list of waters which might exhibit the characteristics of the outstanding water class. Their objective is to develop criteria for selecting outstanding waters. As such, a variety of lakes and streams were chosen for review and monitoring. Candidate streams generally involve the headwater stretches, within which one or more assessment sites are established for monitoring. A site can be visited several times annually, over one or more years.

Information sheets are prepared for each area, detailing ownership, land and water uses, point and non-point pollution sources, and special aquatic features, as defined by the "Environmentally Significant Areas" program.

Most of the data is collected in the field, but water and invertebrate samples require lab analysis to determine water chemistry, bacterial counts, chlorophyll content, and benthic composition. Field data general includes:

- Weather Conditions
- Water Temperature
- Dissolved Oxygen
- Secchi Disc (lakes)

For lakes, water parameters may be measured at various depths, and in some cases complete temperature and dissolved oxygen profiles are measured.

Monitoring sites and the lakes and streams involved in the study areas have been incorporated within GIS.

DATA SOURCES

All River Classification data was obtained from the New Brunswick Department of the Environment.

POSITIONAL ACCURACY

There are two aspects of the River Classification Program which have spatial representation within GIS - the monitoring sites and the lakes and/or streams encompassed within a study area. The positional accuracy of the monitoring sites is based on UTM coordinates (NAD27) and textual descriptions of locations. GPS devices were not used. The accuracy of the hydrographic data is ±1.5m to ±2.5m. Refer to **SNB's Land and Water Information Standards** Manual for further details.

DATA FILES

Tabular Data

There are four tables of information associated with the River Classification Program. The table structure is a hierarchical approach from the general to the specific. As such, the first table identifies the lakes and streams chosen for study. The second table maintains a list of monitoring sites and the third contains information on each visit to a monitoring site. The data collected during the field survey is presented in the fourth table, which records water parameters at various sampling depths. All tables contain a Water Body ID and a River Classification Program ID for linking to a specific lake or stream (see Water Resource Inventory) and a specific study area. The tables can be described as follows:

- **River Classification Program Study Areas** - list of rivers and lakes which are being studied by the River Classification Program. The table contains basic information on the water body, including drainage information, plus the number of monitoring sites and the lower limit of the study areas,

- **River Classification Program Monitoring Sites** - contains a list of the assessment or monitoring sites within study areas.

- **River Classification Program Monitoring Site Assessments** - indicates the date and weather conditions each time a river classification study area or study site was visited. It also indicates whether samples were collected for further analysis in the lab. Extended analysis includes water chemistry, chlorophyll, bacterial, and benthic.

- **River Classification Program Monitoring Site Field Data** - maintains the data collected in the field.

Spatial Data

Study areas are mapped through Route System files and dynamic segmentation.

An ArcView shape file was created for monitoring sites. A point coverage is used, rather than dynamic segmentation, as some sampling sites occur in the middle of lakes.

> ***Note***
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> Please refer to the Chapter 10 **Water Quality: Chemistry** and Chapter 11 **Water Quality: Biology** for water chemistry and bacterial count information.

TABULAR DATA FILES

RIVER CLASSIFICATION PROGRAM STUDY AREAS

The ***River Classification Program Study Areas*** table (rc-water.dbf) contains a list of rivers and lakes which have been studied by the NB Department of the Environment's River Classification Program. The table contains basic information on the water body, including drainage information. Each study area is assigned a unique number.

Field of Information	Description	Dbase Field Name	Field Type (Length . Decimals)	Comments
River Classification Study Area ID	Unique number for each study area (assigned by the Data Warehouse)	RC_Prog_ID	Numeric (4)	
Water Body ID	Unique number associated with a lake or stream which has been studied under the River Classification Program	Water_ID	Numeric (8)	
Water Body Name	Name of the lake or stream	Water_Name	Character (40)	
Drainage Codes	Drainage system codes indicating the watershed of the surveyed stream	Drainge_Cd	Character (17)	Appendix A
Agency Code	Code representing the agency who collected or owns the data	Agency_Cd	Character (4)	Code Table 6
Study Area End Point or Lower Limit	Description of the end point of the study area. For streams, the end point may be the stream's mouth or some point upstream. For lakes, it is generally the outlet.	Lwr_Limit	Character (40)	
Number of Monitoring Sites	Number of sampling sites established within a study area	No_Sites	Numeric (2.0)	
Tidal Watercourse ID	Unique identifier of the receiving body of water which flows into the ocean	TidalWtrID	Numeric (8)	
Tidal Watercourse Name	Name of the above stream	TidalWater	Character (30)	
NAQUADAT Sub-basin Code	Alphabetic code representing Environment Canada's ENVIRODAT sub-basin in which the water body belongs. ENVIRODAT (formerly called NAQUADAT) is a national drainage system classification.	NAQUDAT_Cd	Character (2)	Code Table 14
County Code	Code representing the county in which the water body is located.	County_Cd	Character (2)	Code Table 26
County	Name of county in which the water body is located	County	Character (20)	
DNRE Region	NB Natural Resources and Energy administrative region in which water body is located	DNR_Region	Character (4)	Code Table 13
Environmentally Significant Area Indicator	Indicates whether there is one or more "Environmentally Significant Areas" as defined by the Nature Trust of New Brunswick within the study area	ESA_Ind	Character (1)	Y = Yes N = No
From Measure	***FOR GIS PURPOSES***. Starting point along the stream route where the study area begins. Measurement in meters	From_Meas_m	Numeric (12.1)	
To Measure	***FOR GIS PURPOSES***. End location along the stream route where the study area ends. Measurement in meters	To_Meas_m	Numeric (12.1)	

RIVER CLASSIFICATION MONITORING SITES

The ***River Classification Monitoring Sites*** table (rc-sites.dbf) maintains the list of monitoring or sampling sites within the river classification study areas. Its purpose is to uniquely identify each site and maintain the location information.

Field of Information	Description	Dbase Field Name	Field Type (Length . Decimals)	Comments
River Classification Site ID	Unique identifier for each assessment site within the River Classification Program (assigned by the Data Warehouse)	RC_Site_ID	Numeric (4)	
River Classification Study Area ID	Unique number of the study area in which the monitoring site is associated (assigned by the Data Warehouse)	RC_Prog_ID	Numeric (4)	
Water ID	Unique number of the lake or stream where the site is found	Water_ID	Numeric (8)	
Water Name	Name of the lake or stream	Water_Name	Character (40)	
Drainage Codes	Drainage system codes indicating the watershed of the surveyed stream	Drainge_Cd	Character (17)	Appendix A
Agency Code	Code representing the agency who collected or owns the data	Agency_Cd	Character (4)	Code Table 6
Agency Program	Data may be collected by different programs within a given agency, such as the NB Dept. of the Environment	Ag_Prog_No	Character (4)	
Agency's Site No.	Site identifier used by the agency, e.g. station number	Ag_Site_ID	Character (12)	
Site Description	Description of the location of the assessment site	Site_Des	Character (150)	
Years Assessed	List of years the site has been assessed	Yrs_Assess	Character (20)	
NTS Map No.	National Topographic Series map sheet number on which sampling site is located	NTS_Map	Character (9)	
UTM Zone	UTM (Universal Trans Mercator) projection system zone (NAD27) in which sampling site is located	UTM_Zone	Numeric (2)	
UTM Northing Coordinate	UTM Northing coordinate (NAD27) of the sampling site	UTM_North	Numeric (8)	
UTM Easting Coordinate	UTM Easting coordinate (NAD27) of the sampling site	UTM_East	Numeric (8)	

RIVER CLASSIFICATION ASSESSMENTS

The ***River Classification Assessments*** table (rc-assmt.dbf) maintains the information about each visit to a river classification monitoring site. It includes the date, time, weather conditions, and whether samples were collected for further analysis in the lab. Extended analysis includes water chemistry, chlorophyll, bacterial, and benthic invertebrates.

Field of Information	Description	Dbase Field Name	Field Type (Length . Decimals)	Comments
River Classification Assessment ID	Unique identifier for each visit to a River Classification Program monitoring site (assigned by the Data Warehouse)	RCAssmt_ID	Numeric (4)	
River Classification Site ID	Unique identifier of the sampling site where assessment occurred (assigned by the Data Warehouse)	RC_Site_ID	Numeric (4)	
River Classification ID	Unique identifier of the study area (assigned by the Data Warehouse)	RC_Prog_ID	Numeric (4)	
Water Body ID	Unique number of the lake or stream in which the site belongs	Water_ID	Numeric (8)	
Water Body Name	Name of the lake or stream	Water_Name	Character (40)	
Drainage Codes	Drainage system codes indicating the watershed of the surveyed stream	Drainge_Cd	Character (17)	Appendix A
Agency Code	Code representing the agency who collected or owns the data	Agency_Cd	Character (4)	Code Table 6
Agency Project No.	Internal project number assigned by the Department of Environment	Ag_Proj_No	Numeric (2)	
Station No.	Sampling station number assigned by the River Classification Program	Ag_Site_ID	Character (12)	
Assessment Date	Date of assessment. Date format is YYYY-MM-DD.	Assmt_Date	Character (10)	
Time of Day	Time of day when assessment occurred	Assmt_Time	Character (4)	
Weather Conditions	Weather condition at the time of the assessment	Weather	Character (50)	
Secchi Disc	Secchi disc measurement for determining water transparency. Measured in metres	Secchi	Numeric (5.2)	
Chemical Analysis Indicator	Indicates whether water chemistry analysis was performed on a water sample	ChemAn_Ind	Character (1)	Y = Yes N = No
Chlorophyll Analysis Indicator	Indicates whether chlorophyll analysis was performed on a water sample	ChlrAn_Ind	Character (1)	Y = Yes N = No
Bacterial Analysis Indicator	Indicates whether bacterial analysis performed on a water sample	BactAn_Ind	Character (1)	Y = Yes N = No
Benthic Analysis Indicator	Indicates whether benthic invertebrate counts were performed on a collected sample	BentAn_Ind	Character (1)	Y = Yes N = No
Comments	General comments	Comments	Character (150)	

RIVER CLASSIFICATION FIELD DATA

The ***River Classification Field Data*** table (rc-fmsr.dbf) maintains the field data gathered each time a river classification site is visited. The data is recorded at specific depths Although the water parameters are generally measured on the surface, some parameters are measured at different depths, especially for lakes. In some cases, complete temperature or dissolved oxygen profiles may be measured.

Field of Information	Description	Dbase Field Name	Field Type (Length . Decimals)	Comments
River Classification Assessment ID	Unique identifier for each visit to a River Classification Program monitoring site (assigned by the Data Warehouse)	RCAssmt_ID	Numeric (4)	
River Classification Site ID	Unique identifier of the sampling site where assessment occurred (assigned by the Data Warehouse)	RC_Site_ID	Numeric (4)	
River Classification ID	Unique identifier of the study area	RC_Prog_ID	Numeric (4)	
Water Body ID	Unique number of the lake or stream in which the site belongs	Water_ID	Numeric (8)	
Water Body Name	Name of the lake or stream	Water_Name	Character (40)	
Drainage Codes	Drainage system codes indicating the watershed of the stream or lake	Drainge_Cd	Character (17)	Appendix A
Agency Code	Code representing the agency who collected or owns the data	Agency_Cd	Character (4)	Code Table 6
Assessment Date	Date of the assessment. Date format is YYYY-MM-DD.	Assmt_Date	Character (10)	
Time of Day	Time of day when assessment occurred	Assmt_Time	Character (4)	
Water Depth of Measurement	Indicates whether the field measurements for temperature and dissolved oxygen are gathered at the surface (0 m) or at a specific depth measured in meters	Samp_Depth_m	Numeric (5.1)	
Water Temperature	Temperature of water measured in °C	Water_Temp_°C	Numeric (5.2)	
Dissolved Oxygen	Dissolved oxygen content of the water sample measured in mg/l	DO	Numeric (11.4)	

SPATIAL DATA FILES

RIVER CLASSIFICATION MONITORING POINTS

The ***River Classification Monitoring Points*** spatial file (rc-sites) is a point coverage representing the locations of the monitoring sites. A point file was created rather than using dynamic segmentation as some sampling sites are in the middle of lakes where there is no route system to attach the data.

Field of Information	Description	Dbase Field Name	Field Type (Length . Decimals)	Comments
Internal ID	Internal ID generated by GIS to uniquely identify each point	ID	Numeric (8)	
River Classification Site ID	Unique identifier of the sampling site where assessment occurred (assigned by the Data Warehouse)	RC_Site_ID	Numeric (4)	
Water Body ID	Unique number of the lake or stream in which the site belongs	Water_ID	Numeric (8)	
Water Body Name	Name of lake or stream	Water_Name	Character (40)	
Drainage Codes	Drainage system codes indicating the watershed of the stream or lake	Drainge_Cd	Character (14)	Appendix A