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Rural Municipality of South Norfolk

Information Bulletin 97-19

Soils and Terrain

An introduction to the land resource

Land Resource Unit
Brandon Research Centre

Canada

Rural Municipality of South Norfolk

Information Bulletin 97-19

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PREFACE

This is one of a new series of information bulletins for individual rural municipalities of Manitoba. They serve to introduce the newly developed digital soil databases and illustrate several typical derived and interpretive map products for agricultural land use planning applications. The bulletins will also be available in diskette format for each rural municipality.

Information contained in this bulletin may be quoted and utilized with appropriate reference to the originating agencies. The authors and originating agencies assume no responsibility for the misuse, alteration, re-packaging, or re-interpretation of the information.

This information bulletin serves as an introduction to the land resource information available for the municipality. More detailed information, including copies of the primary soil and terrain maps at larger scales, may be obtained by contacting

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Figure 1. Rural municipalities in southern Manitoba with digital soil and terrain map information.

INTRODUCTION

The location of South Norfolk municipality is shown in Figure 1. The soil information was derived from a detailed (1:20 000 and 1:50 000 scale) survey (Soils of the Rural Municipality of South Norfolk, Report D74). A brief overview of the database information assembled, and general environmental conditions is presented. A set of maps derived from the data for typical agricultural land use and planning applications is also included.

The soil map and database was compiled and registered using the computerized Geographic Information System (PAMAP GIS) facilities of the Manitoba Land Resource Unit. These databases were used in GIS to create the generalized, derived and interpretive maps and statistics contained in this report.

LAND RESOURCE DATA

The soil and terrain (landscape) information presented in this bulletin was compiled as part of a larger project to provide a uniform level of land resource information for agricultural and regional planning purposes throughout Agro-Manitoba. This information was compiled and analysed in two distinct layers as shown in Figure 2.

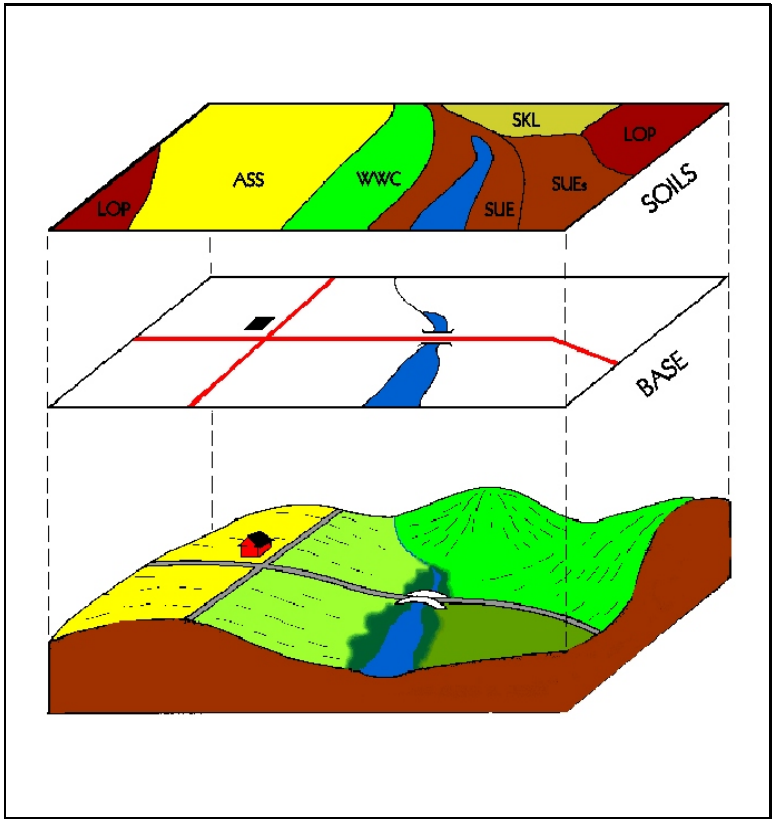


Figure 2. Soil and Base Map data.

Base Layer

Digital base map information includes the municipality and township boundaries, along with major streams, roads and highways. Major rivers and lakes from the base layer were also used as common boundaries for the soil map layer. Water bodies larger than 25 ha in size were digitized as separate polygons.

Soil Layer

The most detailed soil information currently available was selected as the data source for the digital soil layer for each rural municipality. The soil was added and aligned ("georeferenced") to the digital base map.

A comprehensive detailed (1:20000 scale) and semi-detailed (1:50 000 scale) soil map (Langman, 1988), was digitized and compiled as a single georeferenced layer to match the digital RM base. Map polygons have one or more soil series components, as well as erosion, slope, stoniness, and salinity classes. Soil database information was produced for each polygon, to meet national standards (MacDonald and Valentine, 1992). Slope length classes were added, based on photo-interpretation.

Each soil polygon on the map was assigned the following legend characteristics:

- soil series
- modifier codes
- soil phases
- polygon number

The soil and modifier codes provide a link to additional databases of soil properties. In this way, soil map polygons were related to soil drainage, surface texture, and other properties to produce the generalized, derived and interpretative maps presented in this bulletin.

LAND RESOURCE OVERVIEW

The Rural Municipality of South Norfolk covers 8.5 Townships (approximately 74 500 ha) in south-central Manitoba. The towns of Treherne, Rathwell and Notre Dame de Lourdes are the largest population centres in the municipality.

Soils in the municipality of South Norfolk have been recently mapped and published at a scale of 1:20 000 and 1:50 000 in Report D74, Soils of the Municipality of South Norfolk (Langman, 1988).

Based on climatic data from Rathwell (Environment Canada, 1993), the mean annual temperature is 2.9°C; mean annual precipitation is 497.3 mm. There are no continuous climatic station within the RM of South Norfolk that have complete data sets for degree days and frost free period. Climatic data from Cypress River may approximate the conditions in the RM. Degree days above 5ºC at Cypress River is 1746.6 and the mean frost-free period is 116 days (Environment Canada, 1982). The seasonal moisture deficit for the period May to September is 250 mm; effective growing degree days (EGDD) above 5ºC for the same period is 1500 to 1600. This parameter provides an indication of heat energy available for crop growth (Agronomic Interpretations Working Group, 1995). These conditions are generally adequate for cereal crop production.

Relief in the RM of South Norfolk ranges from a high of approximately 500 metres above sea level (m.a.s.l.) in the south near the junctions of municipal roads 245 and 449, to a low of approximately 300 m.a.s.l. along the Assiniboine Valley in the north. Approximate average elevations in the Municipality are 350 m.a.s.l. below the Escarpment in the north and east, and 490 m.a.s.l. in the south and west.

South Norfolk can be divided into four general physiographic regions (Upper Assiniboine Delta, Lower Assiniboine Delta, Brandon Lakes Plain, and Pembina Hills). The Upper Assiniboine Delta occupies the north west corner of the RM where a large area of deltaic sands were deposited as the Assiniboine River entered the former glacial lake Agassiz. The Upper Assiniboine Delta is characterized by level terrain and sandy textured fluvial outwash deposits and loamy textured deltaic and lacustrine sediments. Most of the coarse sandy deposits have been modified by wind and occur as stabilized dunes with relief up to 20 m and steep slopes up to 30%. The dominant soils in this portion of the RM are Black Chernozems developed on well to imperfectly drained sandy to loamy sediments. Orthic Regosols occur on the rapidly to well drained duned sands.

Within the Upper Assiniboine Delta, soils have been mainly described as Shilox, Dobbin, Halstead, and Firdale. Shilox soils (Regosols) are found in areas where duned sands are common. On wooded gently undulating landscapes adjacent to the eolian sands the Dobbin (Dark Grey Chernozem) soil series is common. Level to gently undulating lacustrine sands and loams not affected by eolian processes, are generally mapped as Halstead and Firdale series (Dark Gray Chernozems).

Gently undulating lacustrine sands within the Upper Assiniboine Delta are usually rated as class 3 and 4 for dryland agriculture due their low water holding capacity. These soils are generally rated fair to poor for irrigation due to topography and low water holding capacity.

The duned areas are mainly used as park land for recreation and wildlife. Agriculture capability is class 6 and 7 and the soils are generally unsuitable for irrigation due to steep topography and low water retention. These lands are highly sensitive. They are very susceptible to wind erosion if surface vegetation is disturbed. These soils also have a high potential for adverse environmental impact under poor management.

The Lower Assiniboine Delta extends along the eastern edge of the RM. It is characterized by level to gently undulating lacustrine sands overlying fine textured materials at depths of 3 to 4 m. Soils in this area are dominantly imperfectly drained Black Chernozems (Almassippi, Willowcrest, and St. Claude) with inclusions of poorly drained Rego Humic Gleysols (Lelant). Areas of wind modified lacustrine sands are also common within this area and are represented by well drained Regosols (Skelding) and imperfectly drained Regosols (Long Plain). Most soils within the Lower Assiniboine delta are affected by high water tables.

Capability for dryland agricultural is class 3 and 4 for the imperfectly drained sites and class 5 or 6 in the poorly drained locales. The Lower Assiniboine Delta is generally suitable for irrigation, however, the high water tables and rapid permeability results in a high potential for adverse environmental impact from irrigation. Theses soils are also very susceptible to wind erosion and proper management of crop residues is needed. As result of increased slope gradients and lower fertility levels, the Skelding and Long Plain series are less suitable for dryland agriculture (class 4 to class 6). These soils are generally not suited for irrigation.

Brandon Lake Plain, a flat-lying lacustrine plain, extends south of the Assiniboine River to the Pembina and Tiger Hills. The Boyne River north to the Assiniboine River approximates the eastern edge of the plain which generally occurs between 320 m.a.s.l. to 370 m.a.s.l. and has less than 5 m of local relief. The moderately permeable loamy to fine loamy deposits common to the area are drained into the Assiniboine and Boyne Rivers by a series of short, shallow tributaries. Soils are mostly well drained, highly fertile (CLI class 1 and 2), Black Chernozems which produce a wide variety of crops including cereals, oil seeds, corn and potatoes. The soils in this area range from well drained Fairland, Ramada and Winkler to imperfectly drained Prodan, Charman , Deadhorse and Plum Coulee and poorly drained Tadpole and Osborne soils. An area of lacustine sands similar to those found in the Lower Assiniboine Delta occurs in the north central part of the Brandon Lakes Plain. Soils conditions and capabilities are similar to those of the Lower Assiniboine Delta. Water erosion is a potential soil hazard on strongly sloping land adjacent to stream tributaries and near the Assiniboine River valley.

The Assiniboine River flows in a large glacial meltwater channel. Dominantly loamy fluvial-lacustrine deposits are found in the channel on level terraces varying from 1 to 3 km in width at elevations of 300 to 380 m a.s.l. Higher level terraces are mostly well drained while those closer to the present river level are imperfectly drained with a relatively high seasonal water table. Occasional flooding adds new sediment to the low level terraces, producing soils which are dominantly Cumulic Regosols (Gervais and La Salle). Black Chernozemic soils occur in areas located above the threat of flooding and are commonly described as Janick, Croyon and Ramada soils. Steep forested valley slopes between the level terraces contain Black and Dark Gray Chernozemic soils. Halstead soils are typical on these slopes.

Level terrace soils generally have a high agricultural capability (mostly CLI class 2) and support a wide variety of crops. Small deposits of sand and gravel also occur in the terraces and have been exploited as an aggregate source for road construction.

A bedrock-controlled, hummocky morainic landscape occurs in the southwest corner of the Municipality. This upland area ranges in elevation from 380 to 495 m a.s.l. with a local relief of 5 to 15 m on isolated knolls. Surface deposits consist dominantly of a variable thickness of loamy to fine loamy, slightly stony glacial till over shale bedrock. Dark Gray Chernozems dominate on these well drained, moderately permeable soils in upland areas where runoff is rapid and the water table is usually well below the rooting depth. Dezwood and Pembina soils occur in this area on mixed Lennard till. Altamont soils are common where the till is overlain by shallow lacustrine deposits. Humic Gleysols (Horose, Narish and Guerra) occur in depressional areas associated with the upland knolls. Drainage in these lows is poor and surface ponding is common. Steeply sloping uplands are mostly wooded or are cleared for grazing. Gently sloping uplands are mostly deforested and cultivated for cereal crop production. Localized areas of lacustrine loam over coarse textured glacial fluvial deposits occur within in the Pembina Hills. Croyon and Vandel soils are dominant in these well drained sites. Carvey (Rego Humic Gleysol) is found in depressional areas where drainage is resticted. Capability for dryland agriculture varies greatly within this region and is dependant upon topography and drainage. The steep topography of the area is the main limitation (CLI class 6T and 4T) to agricultural productivity. Water erosion is also a soil hazard on steep landscapes.

DERIVED AND INTERPRETIVE MAPS

A large variety of computer derived and interpretive maps can be generated, once the soil and landscape data are stored in digital format. These maps are based on selected combinations of database values and assumptions.

Derived maps show information that is given in one or more columns in the computer map legend (such as surface soil texture, drainage, salinity, or slope class).

Interpretive maps portray more complex land evaluations based on information presented in the legend. Interpretations are based on soil and landscape conditions in each polygon. Interpretative maps typically show land capabilities, suitabilities, or risks related to sustainability.

Several examples of derived and interpretive maps included in this information bulletin are:

<u>Derived Maps</u>
Slope Classes
Surface Texture
Soil Drainage
Soil Salinity
Management Considerations

<u>Interpretative Maps</u>
Agricultural Capabilities
Irrigation Suitability
Potential Environmental Impact
Water Erosion Risk
Land Use

The maps have all been reduced in size and generalized (simplified), in order to portray conditions for an entire rural municipality on one page.. These generalized maps provide a useful overview of conditions within a municipality, but are not intended to apply to site specific land parcels. On-site evaluations are recommended for localized site specific land use suitability requirements.

Digital databases derived from recent detailed soil inventories contain additional detailed information about significant inclusions of differing soil and slope conditions in each map polygon. This information can be portrayed at larger map scales than shown in this bulletin.

Information concerning particular interpretive maps, and the primary soil and terrain map data, can be obtained by contacting the Manitoba Soil Resource Sectio, of Manitoba Agriculture, the local PFRA office, or the Manitoba Land Resource Unit.

Slope Map.

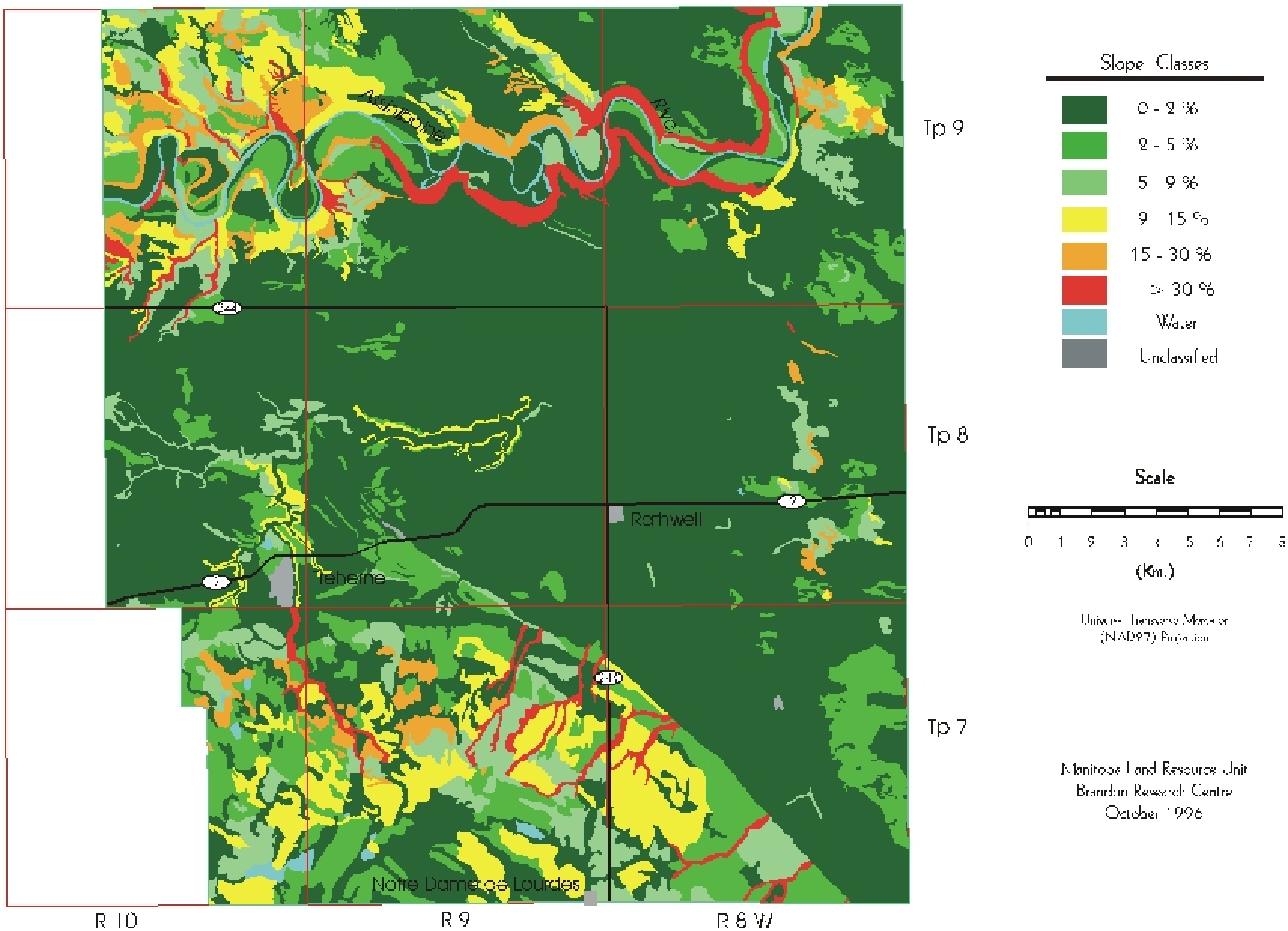
Slope describes the steepness and complexity of the landscape surface. The slope classes shown on this map are derived from the digital soil layer database. Specific colours are used to indicate the dominant slope class for each soil polygon in the R.M.. Additional slope classes may occur in each polygon area, but cannot be portrayed at this reduced map scale.

Table 1. Slope Classes[1]

Slope Class	Area (ha)	Percent of RM
0 - 2 %	46590	62.5
2 - 5 %	10664	14.3
5 - 9 %	5769	7.7
9 - 15 %	6099	8.2
15 - 30 %	2330	3.1
> 30 %	2306	3.1
Unclassified	164	0.2
Water	654	0.9
Total	74575	100.0

[1] Based on **dominant** slope gradient of each soil polygon.

Rural Municipality of South Norfolk Slope Map



Surface Texture Map.

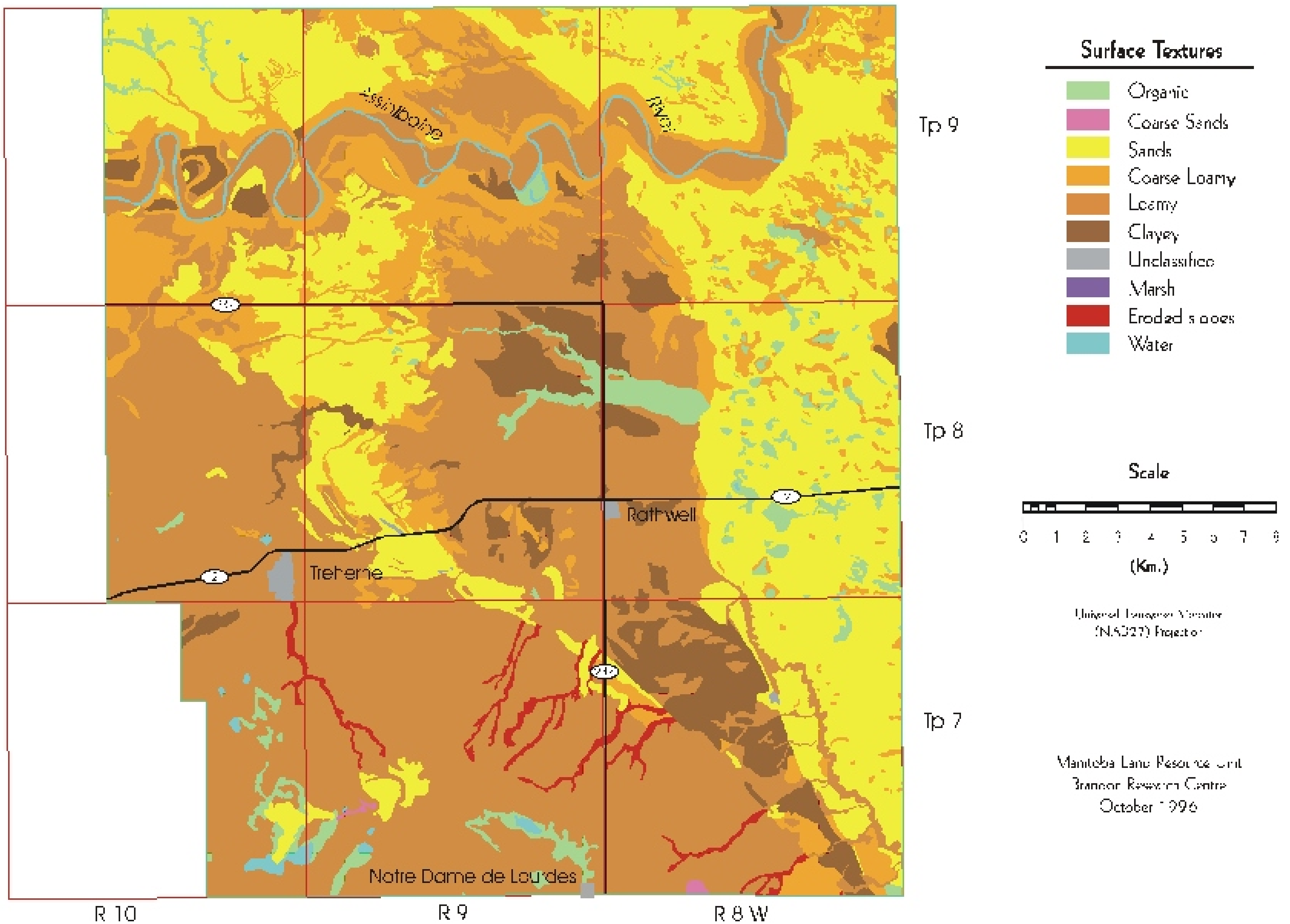
The soil textural class for the upper most soil horizon of the dominant soil series within a soil polygon was utilized for classification. Texture may vary from that shown with soil depth and location within the polygon.

Table 2. Surface Texture[1]

Surface Texture	Area (ha)	Percent of RM
Organics	659	3.0
Coarse Sands	52	0.2
Sands	3488	15.7
Coarse Loamy	775	3.5
Loamy	14459	65.1
Clayey	1845	8.3
Eroded Slopes	744	3.3
Marsh	0	0.0
Unclassified	11	0.1
Water	173	0.8
Total	22205	100.0

[1] Based on **dominant** soil series for each soil polygon.

Rural Municipality of South Norfolk — Surface Texture Map



Soil Drainage Map.

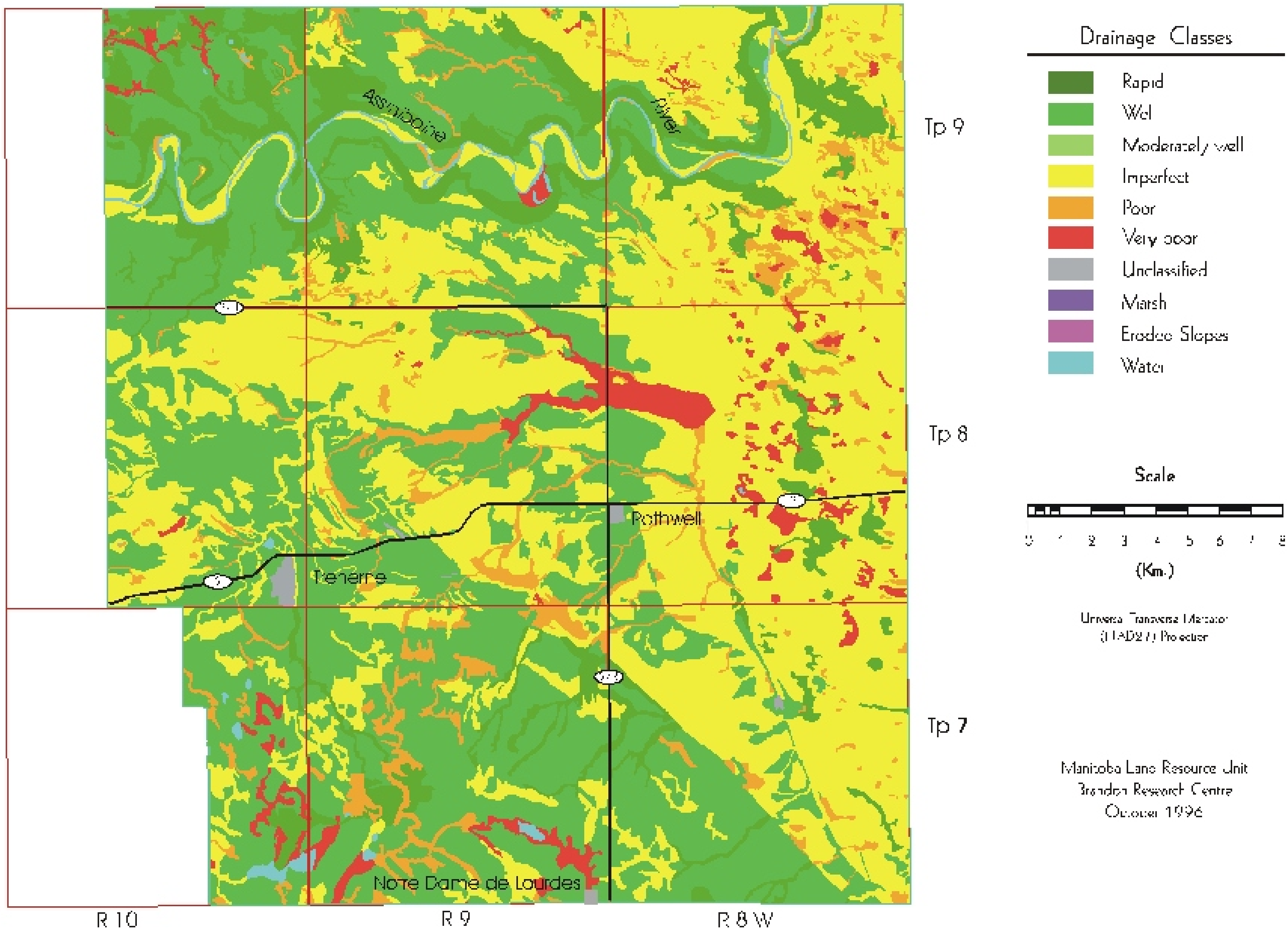
Drainage is described on the basis of actual moisture content in excess of field capacity, and the length of the saturation period within the plant root zone. Drainage classification was based upon the dominant soil series of each individual soil polygon. A description of the various soil drainage classes can be found in Soils of the Rural Municipality of South Norfolk, Report No. D74 (Langman, 1988).

Table 3. Drainage Classes[1]

Drainage Class	Area (ha)	Percent of RM
Very Poor	2331	3.1
Poor	4305	5.8
Imperfect	30900	41.4
Moderately Well	0	0.0
Well	28886	38.7
Rapid	7334	9.8
Eroded Slopes	0	0.0
Marsh	0	0.0
Unclassified	164	0.2
Water	654	0.9
Total	74575	100.0

[1] Area has been assigned to the dominant drainage class for each soil polygon.

Rural Municipality of South Norfolk Soil Drainage Map



Soil Salinity Map.

A saline soil contains soluble salts in such quantities that they interfere with the growth of most crops. Soil salinity is determined by the electrical conductivity of the saturation extract in decisiemens per metre (dS/m). Approximate limits of salinity classes are:

non-saline	0 to 4 dS/m
slightly saline	4 to 8 dS/m
moderately saline	8 to 16 dS/m
strongly saline	> 16 dS/m

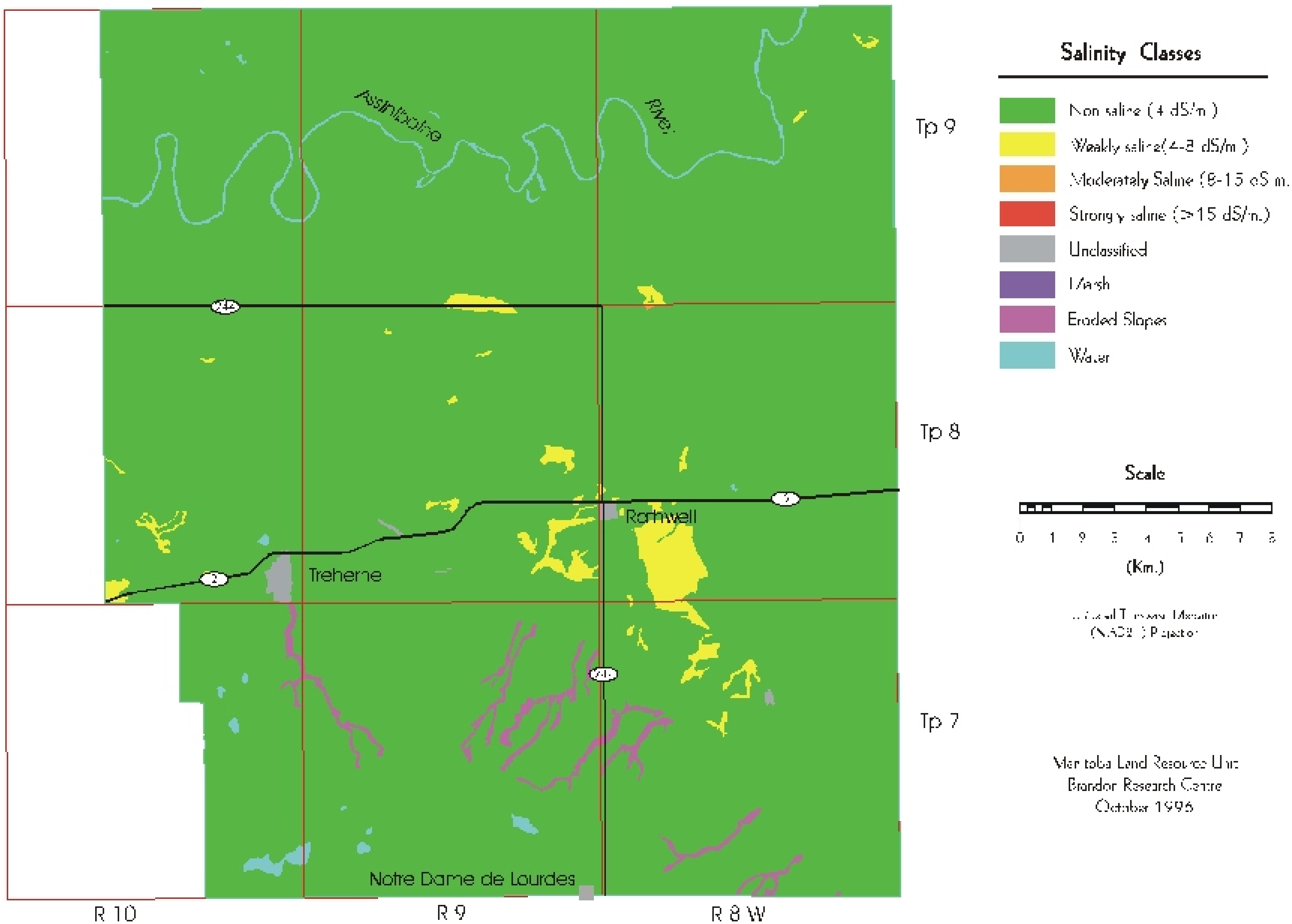
The salinity classification of each individual soil polygon was determined by the most severe salinity classification present within that polygon.

Table 4. Salinity Classes[1]

Salinity Class	Area (ha)	Percent of RM
Non Saline	71253	95.5
Weakly Saline	1757	2.4
Moderately Saline	3	0.0
Strongly Saline	0	0.0
Eroded Slopes	744	1.0
Marsh	0	0.0
Unclassified	164	0.2
Water	654	0.9
Total	74575	100.0

[1] Area has been assigned to the dominant salinity class for each soil polygon.

Rural Municipality of South Norfolk Soil Salinity Map



Management Considerations Map.

Management consideration maps are provided to focus on awareness of land resource characteristics important to land use. This map does not presume a specific land use. Rather it portrays the most common and wide spread attributes that apply to most soil landscapes in the province.

These maps **highlight attributes** of soil-landscapes that the land manager must consider for any intended land use:

- **Topography**
- **Wetness**
- **Coarse texture**
- **Medium texture**
- **Fine texture**
- **Organic**
- **Bedrock.**

F = Fine texture - soil landscapes that have **fine textured soils (clays and silty clays),** and thus low infiltration and internal permeability, require special considerations to mitigate surface ponding (water logging), runoff, trafficability. Timing and type of tillage practices used may be restricted.

C = Coarse texture - soil landscapes that have **coarse to very coarse textured soils (loamy sands, sands and gravels)** and hence a high permeability throughout the profile, require special management practices related to application of agricultural chemicals, animal wastes, and municipal effluent to protect and sustain the long term quality of the soil, and water resources. The risk of soil erosion can be minimized through the use of shelterbelts and maintenance of crop residues.

M = Medium texture - soil landscapes that have medium to moderately fine texture **(loams to clay loams)** and hence have good water and nutrient retention properties, require good management and cropping practices to minimize leaching and the risk of erosion.

T = Topography - soil landscapes that have **slopes greater than 5 %** are steep enough to require special management practices to minimize the risk of erosion.

W = Wetness - soil landscapes that have **poorly drained soils and/or >50 % wetlands** (due to seasonal and annual flooding, surface ponding, permanent water bodies (sloughs), and/or high water tables), require special management practices to mitigate adverse impact on water quality, protect subsurface aquifers, and sustain crop production during periods of high risk of water logging.

O = Organic - soil landscapes that have organic soils, require special management considerations of drainage, tillage, and cropping to sustain productivity and minimize subsidence and erosion.

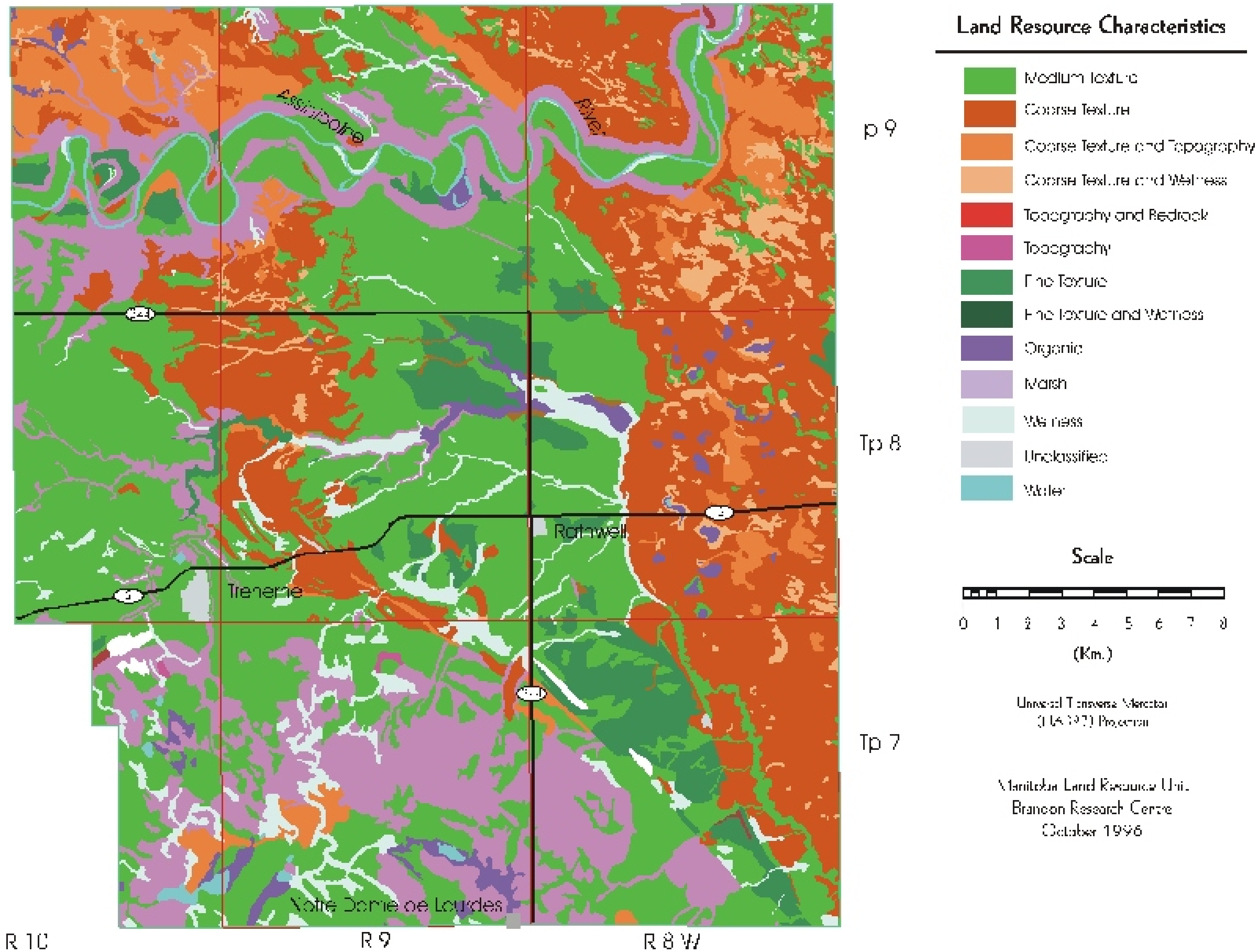
R = Bedrock - soil landscapes that have shallow depth to bedrock (< 50 cm) and/or exposed bedrock which may prevent the use of some or all tillage practices as well as the range of potential crops. They require special cropping and management practices to sustain agricultural production.

Table 5. Management Considerations[1]

Land Resource Characteristics	Area (ha)	Percent of RM
Fine Texture	**1659**	**7.5**
Fine Texture and Wetness	**16**	**0.1**
Fine Texture and Topography	**36**	**0.2**
Fine Texture, Wetness and Topography	**0**	**0.0**
Medium Texture	**8011**	**36.1**
Coarse Texture	**3028**	**13.6**
Coarse Texture and Wetness	**88**	**0.4**
Coarse Texture and Topography	**558**	**2.5**
Coarse Texture, Wetness and Topography	**0**	**0.0**
Topography	**6534**	**29.4**
Topography and Bedrock	**42**	**0.2**
Wetness	**1400**	**6.3**
Wetness and Topography	**0**	**0.0**
Bedrock	**0**	**0.0**
Organic	**478**	**2.2**
Marsh	**0**	**0.0**
Unclassified	**11**	**0.1**
Water	**173**	**0.8**
Total	**22205**	**100.0**

[1] Based on **dominant** soil series for each soil polygon.

Rural Municipality of South Norfolk Management Considerations Map



Agricultural Capability Map.

This evaluation utilizes the 7 class Canada Land Inventory system (CLI, 1965). Classes 1 to 3 represent the prime agricultural land, class 4 land is marginal for sustained cultivation, class 5 land is capable of perennial forages and improvement is feasible, class 6 land is capable of producing native forages and pasture but improvement is not feasible, and class 7 land is considered unsuitable for dryland agriculture. Subclass modifers include structure and/or permability(D), erosion(E), inundation(I), moisture limitation(M), salinity(N), stoniness(P), consolidated bedrock(R), topography(T), excess water(W) and cumulative minor adverse characteristics(X).

This generalized interpretive map is based on the dominant soil series and phases for each soil polygon. The CLI subclass limitations cannot be portrayed at this generalized map scale.

Table 6. Agricultural Capability[1]

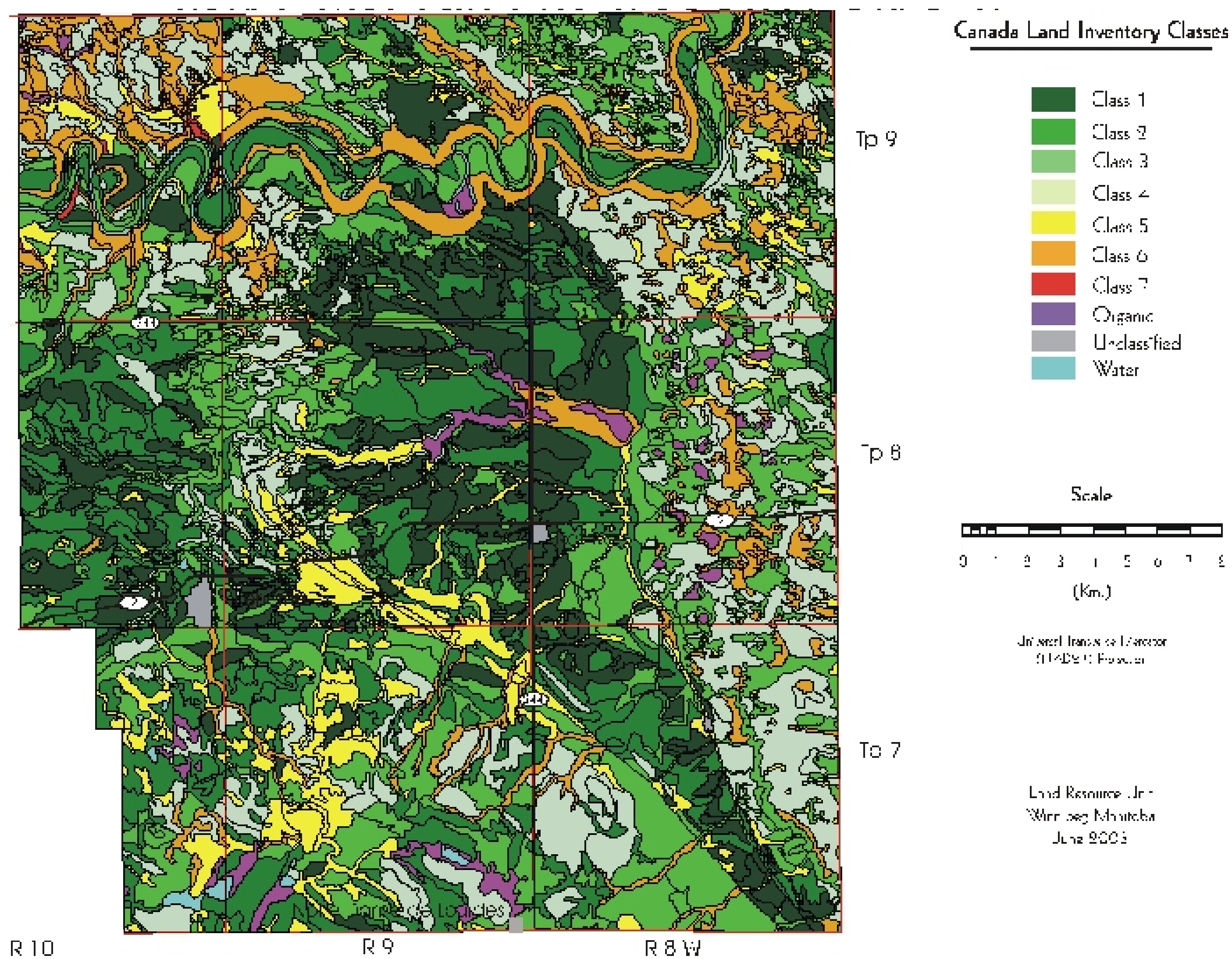
Class Subclass	Area (ha)	Percent of RM
1	**9891**	**13.2**
2	**15166**	**20.3**
2E	4	0.0
2I	539	0.7
2M	2286	3.1
2ME	9	0.0
2MT	81	0.1
2T	2663	3.6
2TE	110	0.1
2TI	744	1.0
2TW	499	0.7
2W	8089	10.8
2X	142	0.2
3	**18473**	**24.7**
3I	1642	2.2
3M	10808	14.5
3ME	20	0.0
3MN	8	0.0
3MT	768	1.0
3N	1223	1.6
3NW	16	0.0
3T	2205	3.0
3TE	454	0.6
3TI	332	0.4
3W	999	1.3

Table 6 (cont). Agricultural Capability[1]

Class Subclass	Area (ha)	Percent of RM
4	**14246**	**19.1**
4	45	0.1
4ET	0	0.0
4M	9758	13.1
4ME	65	0.1
4MT	313	0.4
4N	4	0.0
4R	184	0.2
4RT	27	0.0
4T	3138	4.2
4TE	611	0.8
4W	101	0.1
5	**6954**	**9.3**
5EM	15	0.0
5M	1427	1.9
5ME	47	0.1
5T	1141	1.5
5TE	113	0.2
5W	3470	4.6
5WI	742	1.0
6	**7792**	**10.4**
6EM	20	0.0
6M	3275	4.4
6ME	21	0.0
6MT	47	0.1
6T	3288	4.4
6W	1123	1.5
6WI	19	0.0
7	**106**	**0.1**
7T	106	0.1
Unclassified	**166**	**0.2**
Water	**652**	**0.9**
Organic	**1215**	**1.6**
Total	**74661**	**100.0**

[1] Based on **dominant** soil, slope gradient, and slope length of each soil polygon.

Rural Municipality of South Norfolk Agriculture Capability Map



Irrigation Suitability Map.

Irrigation ratings are based on an assessment of the most limiting combination of soil and landscape conditions. Soils in the same class have a similar relative suitability or degree of limitation for irrigation use, although the specific limiting factors may differ. These limiting factors are described by subclass symbols at detailed map scales. The irrigation rating system does not consider water availability, method of application, water quality, or economics of irrigated land use.

Irrigation suitability is a four class rating system. Areas with no or slight soil and or landscape limitation are rated **Excellent** to **Good** and can be considered irrigable. Areas with moderate soil and/or landscape limitations are rated as **Fair** and considered marginal for irrigation providing adequate management exists so that the soil and adjacent areas are not adversely affected by water application. Soil and landscape areas rated as **Poor** have severe limitations for irrigation.

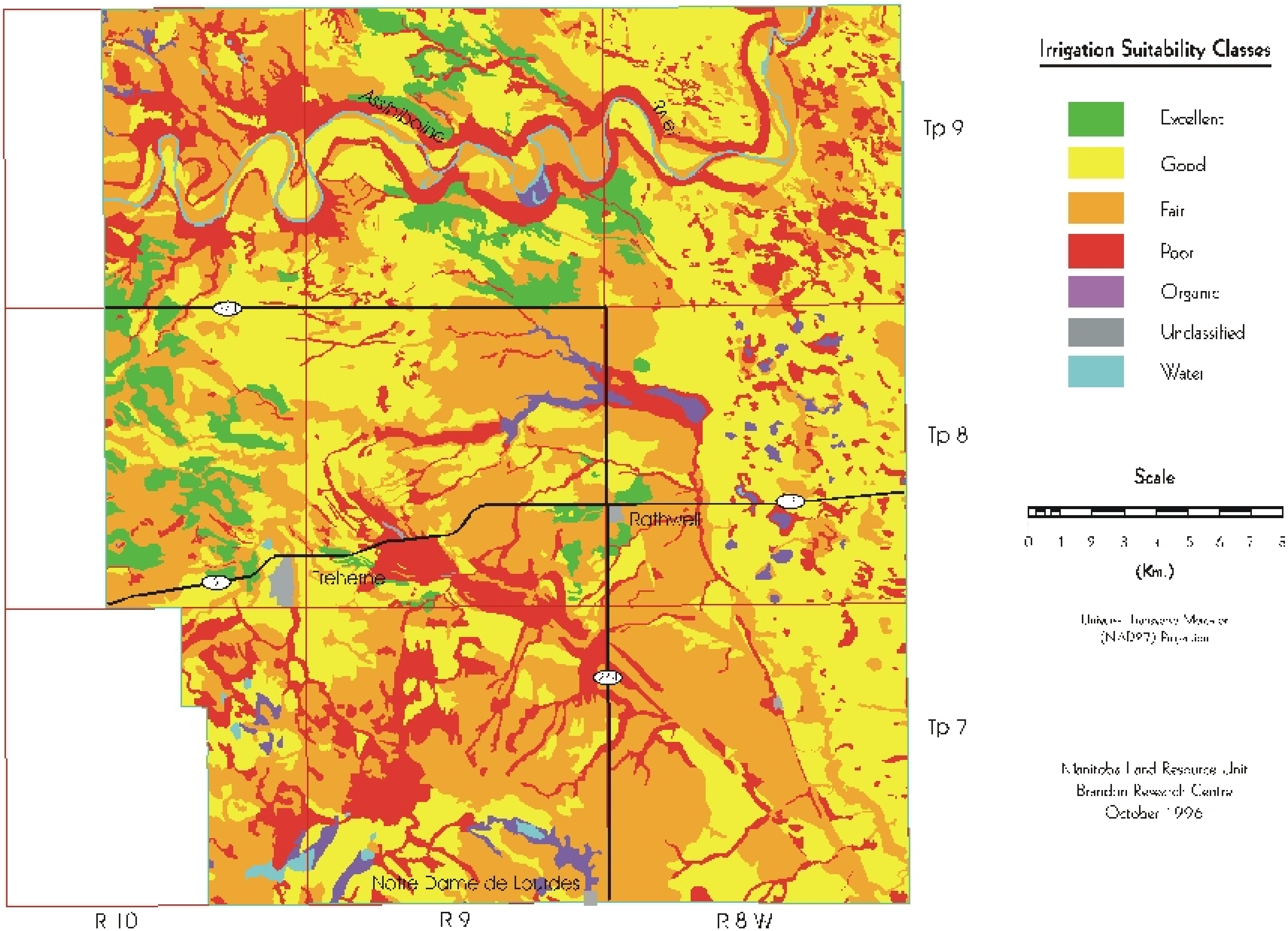
This generalized interpretive map is based on the dominant soil series for each soil polygon, in combination with the dominant slope class. The nature of the subclass limitations and the classification of subdominant components is not shown at this generalized map scale.

Table 7. Irrigation Suitability[1]

Class	Area (ha)	Percent of RM
Excellent	3761	5.0
Good	29166	39.1
Fair	27175	36.4
Poor	12442	16.7
Organic	1213	1.6
Unclassified	164	0.2
Water	654	0.9
Total	74575	100.0

[1] Based on **dominant** soil, slope gradient, and slope length of each soil polygon.

Rural Municipality of South Norfolk Irrigation Suitability Map



Potential Environmental Impact Under Irrigation Map.

A major concern for land under irrigated crop production is the possibility that surface and/or ground water may be impacted. The potential environmental impact assessment provides a relative rating of land into 4 classes (minimal, low, moderate and high) based on an evaluation of specific soil factors and landscape conditions that determine the impact potential.

Soil factors considered are those properties that determine water retention and movement through the soil; topographic features are those that affect runoff and redistribution of moisture in the landscape. Several factors are specifically considered: soil texture, hydraulic conductivity, salinity, geological uniformity, depth to water table and topography. The risk of altering surface and subsurface soil drainage regimes, soil salinity, potential for runoff, erosion and flooding is determined by specific criteria for each property.

Use of this rating is intended to serve as a warning of potential environmental concern. It may be possible to design and/or give special consideration to soil-water-crop management practices that will mitigate any adverse impact.

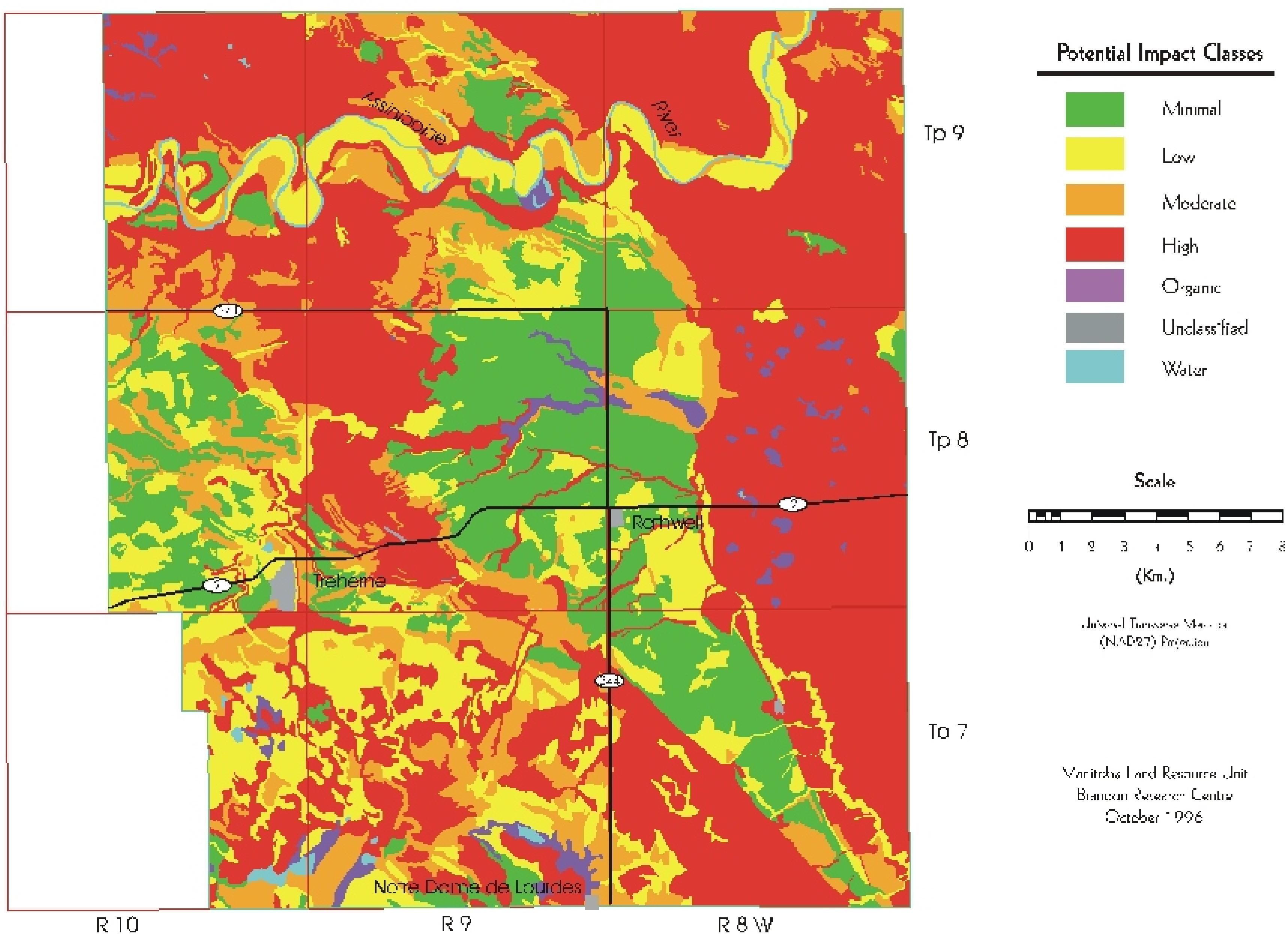
This generalized interpretive map is based on the dominant soil series and slope class for each soil polygon. The nature of the subclass limitations, and the classification of subdominant components is not shown at this generalized map scale.

Table 8. Potential Environmental Impact Under Irrigation[1].

Class	Area (ha)	Percent of RM
Minimal	12520	16.8
Low	13266	17.8
Moderate	10751	14.4
High	36007	48.3
Organic	1213	1.6
Unclassified	164	0.2
Water	654	0.9
Total	74575	100.0

[1] Based on **dominant** soil, slope gradient, and slope length of each soil polygon.

Rural Municipality of South Norfolk Potential Environmental Impact Under Irrigation



Water Erosion Risk Map.

The risk of water erosion was estimated using the universal soil loss equation (USLE) developed by Wischmeier and Smith (1965). The map shows 5 classes of soil erosion risk based on bare unprotected soil:

negligible
low
moderate
high
severe

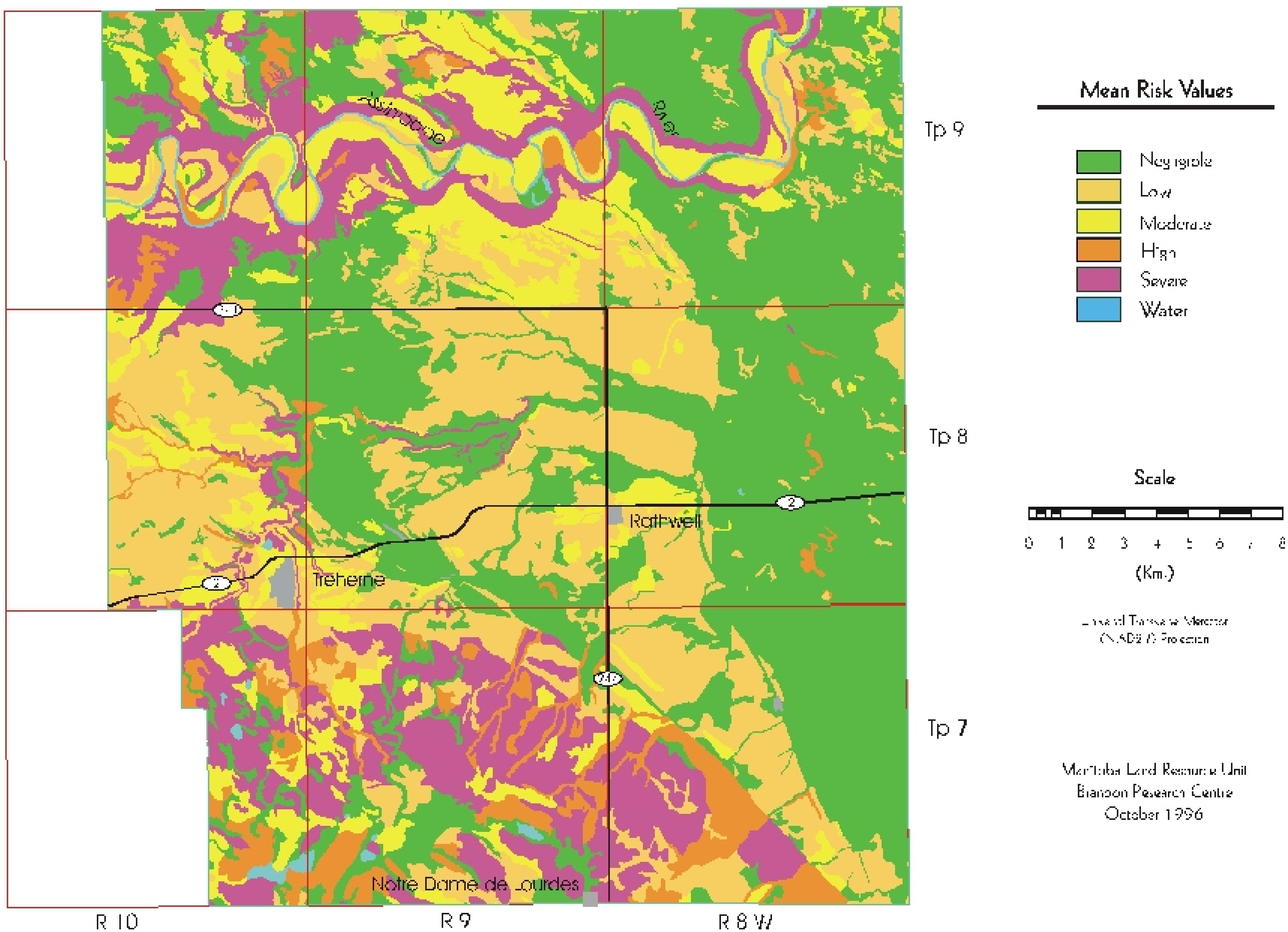
Cropping and residue management practices will significantly reduce this risk depending on crop rotation program, soil type, and landscape features.

Table 9. Water Erosion Risk[1]

Class	Area (ha)	Percent of RM
Negligible	28044	37.6
Low	19337	25.9
Moderate	9698	13.0
High	4484	6.0
Severe	12194	16.4
Unclassified	164	0.2
Water	654	0.9
Total	74575	100.0

[1] Based on **dominant** soil, slope gradient, and slope length of each soil polygon.

Rural Municipality of South Norfolk Water Erosion Risk Map



Land Use Map.

The land use classification of the R.M. has been interpreted from LANDSAT satellite imagery, using supervised computer classification techniques. Many individual spectral signatures were classified and grouped into the seven general land use classes shown here. Although land use changes over time, and some land use practices on individual parcels may occasionally result in similar spectral signatures, this map provides a general representation of the current land use in the R.M..

The following is a brief description of the land use classes.

Annual Crop Land - land that is normally cultivated on an annual basis.

Forage - perennial forages, generally alfalfa or clover with blends of tame grasses.

Grasslands - areas of native or tame grasses, may contain scattered stands of shrubs.

Trees - lands that are primarily in tree cover.

Wetlands - areas that are wet, often with sedges, cattails, and rushes.

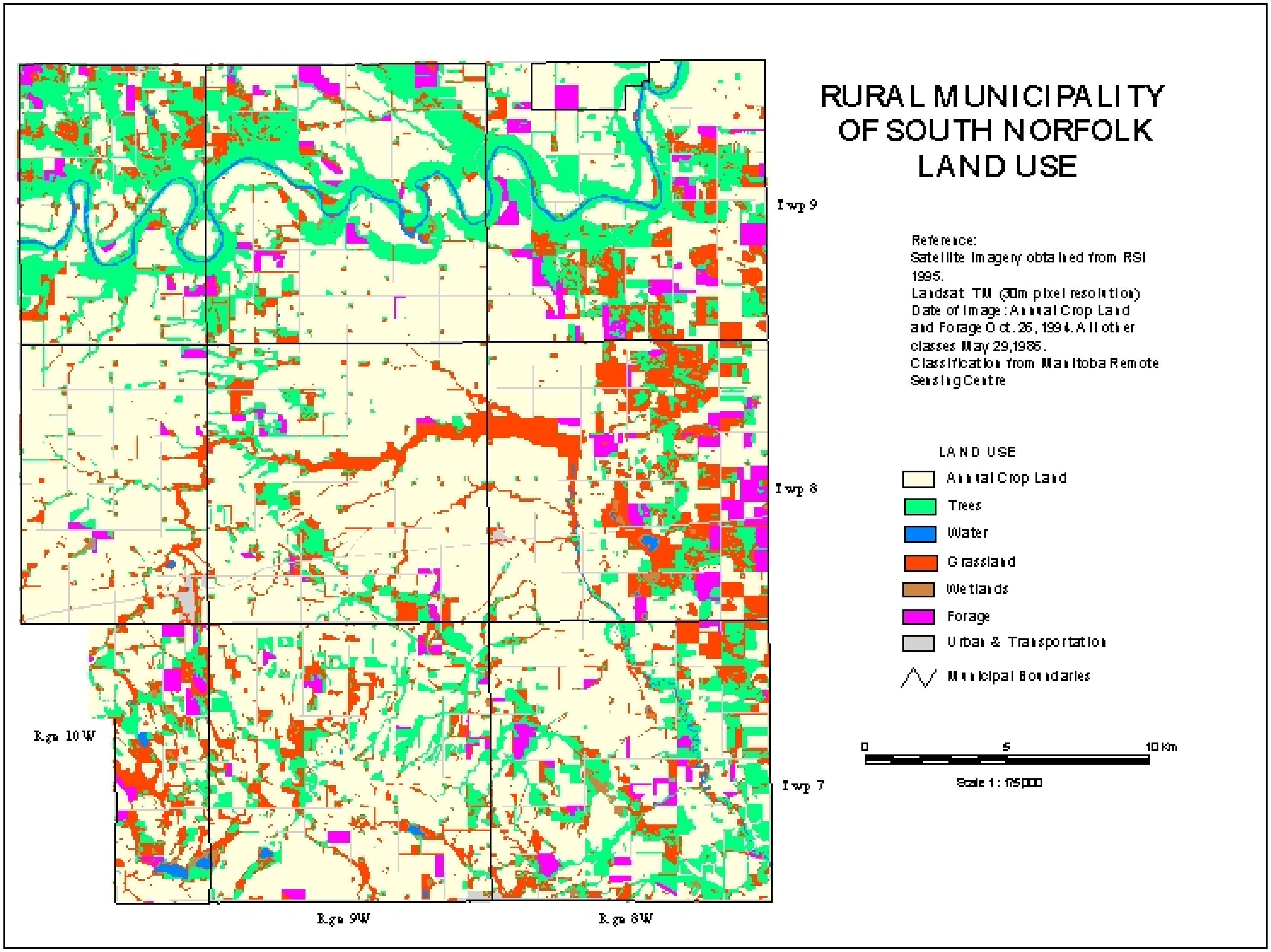
Water - open water lakes, rivers, streams, ponds, and lagoons.

Urban and Transportation - towns, roads, railways, quarries.

Table 10. Land Use[1]

Class	Area (ha)	Percent of RM
Annual Crop Land	44706	59.4
Forage	2745	3.6
Grasslands	9901	13.2
Trees	14396	19.1
Wetlands	289	0.4
Water	727	1.0
Urban and Transportation	2515	3.3
Total	75279	100.0

[1] Land use information (1995) and map supplied by Prairie Farm Rehabilitation Administration. Areas may vary from previous maps due to differences in analytical procedures.


RURAL MUNICIPALITY
OF SOUTH NORFOLK
LAND USE
Reference:
Satellite Imagery obtained from RSI 1995.
Landsat TM (30m pixel resolution)
Date of Image: Annual Crop Land and Forage Oct. 26, 1994. All other classes May 29,1986.
Classification from Manitoba Remote Sensing Centre
LAND USE
Annual Crop Land
Trees
Water
Grassland
Wetlands
Forage
Urban & Transportation
Municipal Boundaries
0
5
10 Km
Scale 1 : 175000
Twp 9
Twp 8
Twp 7
Rge 10W
Rge 9W
Rge 8W

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