Landscape Characteristics

Introduction

The lower Winnipeg River basin (LWRB) is located in the northwest section of the entire Winnipeg River basin (WRB), which spans parts of western Ontario and small parts of Manitoba and northern Minnesota, United States. The Discussion Sheet Series highlights research on ecological and socio-economic aspects of the basin to encourage discussion with experts, government departments, Indigenous groups, and stakeholders. The Discussion Sheet Series is based on available data collected in 2018 and 2019. Sheet 2 of 11 summarizes the landscape characteristics of the LWRB.

Landscape Characteristics

Geology

The majority of the entire Winnipeg River basin (see Figure 1 in Sheet 11: Maps) lies within western Ontario, characterized by the Precambrian Shield with underlying pink granodiorite (Schindler et al., 1996). Due to the Precambrian rock bed in the basin, the river produces high levels of water runoff downstream toward Lake Winnipeg but with low suspended sediments and nutrients (Environment Canada & Manitoba Water Stewardship, 2011).¹ The LWRB is scattered with Precambrian bedrock and areas of organic deposits and sand diamicton (Figure 1). Due to the mineral-rich watershed, there have been mining efforts in the region, with one currently operational mine that extracts tantalum and caesium.²

---

¹ For more information on water quality, refer to Sheet 4: Water Quality and Nutrient Loading.
² For more information on mining, refer to Sheet 10: Industries and Economic Activity.
Landscape Characteristics

Soil

Soil types were surveyed in the Rural Municipalities of Alexander, Lac du Bonnet, and Pinawa in 1999 by the Agriculture and Agri-Food Canada (AAFC) Land Resource Unit (1999a, 1999b, 1999c). Dominant soil types in the LWRB are clayey lacustrine, deep/shallow organic peat, and Precambrian bedrock, with very poor and imperfect drainage and dominant slope class between 0 and 2%.

Land Cover

Land cover in the LWRB was assessed using land-cover data from 2017 and forest cover from 2000 (AAFC, 2017; Hansen et al., 2013). Due to the limited agricultural-capable soils, the watershed is dominated by forested land, at 76% cover, followed by water, temperate or sub-polar grasslands, cropland, wetlands, and minimal shrubland and urban land (Figures 2 and 3). There is minimal cropland in the LWRB, at approximately 3%. There is, however, a patch of cropland to the south of the LWRB along the Whitemouth River, which empties into the Winnipeg River downstream of the Seven Sisters Generating Station (see Sheet 11: Maps).

Landscape characteristics, particularly terrain, soil and sediment types, and land cover, inform how the watershed interacts with the river and potential economic activity, such as forestry or mining. Future research may consider how landscape characteristics influence river discharge and water quality and how associated industries may influence the long-term health and sustainability of the watershed.
Figure 1. Surficial geology and mine site map of the LWRB

Mines Status

- Operational
- Non-operational
- Orphaned and Abandoned

Commodity

- Transition Metals
- Tantalum/Cesium
- Lithium

Surface Geology

- Alluvial Sediments
- Distal Glaciofluvial Sediments
- Eolian
- Marginal Glaciolacustrine Sediments
- Offshore Glaciolacustrine Sediments
- Organic Deposits
- Paleozoic Terrane
- Precambrian Terrane
- Proximal Glaciofluvial Sediments
- Sand Diamicton
- Shoreline Sediments
- Silt Diamicton
- Surface Water

Source: Government of Manitoba, n.d.
**Figure 2.** Land cover (2017) and forest cover (2000) map of the LWRB


**Figure 3.** Land cover (2017) and forest cover (2000) area in the LWRB (4,650 km²)

Source: AAFC, 2017; Hansen et al., 2013.
References


INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT

The International Institute for Sustainable Development (IISD) is an award-winning independent think tank working to accelerate solutions for a stable climate, sustainable resource management, and fair economies. Our work inspires better decisions and sparks meaningful action to help people and the planet thrive. We shine a light on what can be achieved when governments, businesses, non-profits, and communities come together. IISD’s staff of more than 120 people, plus over 150 associates and consultants, come from across the globe and from many disciplines. Our work affects lives in nearly 100 countries.

IISD is a registered charitable organization in Canada and has 501(c)(3) status in the United States. IISD receives core operating support from the Province of Manitoba and project funding from governments inside and outside Canada, United Nations agencies, foundations, the private sector, and individuals.

Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: www.iisd.org
Twitter: @IISD_news