

# Compiling a Land and Water Resources Inventory



*Supporting information for Section II.6 of 1W1P Plan Content Requirements*

Section II.6 of the Plan Content Requirements for One Watershed, One Plan outlines the minimum requirements for the Land and Water Resources Inventory. This document provides additional considerations for what types of information to include, where to find the information, and how to effectively use it.

The inventory, at least in draft format, should be completed before - and used to inform - the identification and prioritization of resources and issues (Section II.2). The inventory should help explain why issues exist in the watershed, and ultimately provides the justification for the actions identified in the plan.

## The Importance of Telling the Watershed Story

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Even though the Land and Water Resources Inventory is recommended to be included in the plan appendix, it is a critical component of the plan and the planning process because it sets the context for the other plan elements. Therefore, the Inventory should paint a clear picture of watershed characteristics using a narrative description, maps, and tables.

Every watershed has a story – its long geological history and its location determine the native soils, vegetation, and natural abundance and quality of lakes, streams, and groundwater. Historical and recent land use changes and hydrologic alterations determine the watershed’s current characteristics, while social and economic factors can give clues about the watershed’s future. It’s also important to acknowledge the watershed’s context within the broader basin because actions in upstream watersheds affect downstream neighbors.

Effectively “telling” the watershed story will establish a common understanding among planning participants, help planning groups identify and prioritize issues, and support the plan’s strategies and actions.

## Content Considerations and Sources

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There are multiple reports, plans, and studies that already contain most, if not all, of the pieces of information you include in your Inventory, but they may not be organized by your planning boundary. The plan must contain sufficient land and water resource information to inform the planning process. Specifically, the plan must include a general description of the available land and water resource information, and where to find that information.

Some types of information are critical to supporting priorities and actions of the plan and may need to be described more thoroughly. For example, a description of trend analysis results may need more in-depth coverage to support a priority issue in the plan, but the data used in the analysis does not need to be included (it

can be referenced). If gaps in inventory information are identified through the plan development process, consider implementation action(s) to fill the gap rather than delaying planning to generate new data.

## Physical Characteristics

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**Table 1** (page 3) lists information types and sources to consider for each required element of the Land and Water Resources Inventory. Some items on this list may not be available or applicable in your watershed, and there may be additional items important to your watershed that are not included. This is simply meant to stimulate ideas on what items to include in the Inventory. The information sources below are good starting points to gather information on your watershed's physical characteristics.

- [Existing local water plans](#)
- [Minnesota Nutrient Planning Portal](#)
- [WRAPS reports \(MPCA\)](#)
- [GRAPS reports \(MDH\)](#)
- [DNR Watershed Health Assessment Framework Context reports](#)
- [Minnesota Forest Resources Council Landscape Stewardship Plans](#)
- [NRCS Rapid Watershed Assessments](#)
- [Minnesota Geospatial Commons](#)

## Socioeconomic Characteristics

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Knowing about the people that live and work in the watershed is crucial to the success of your planning effort. This is a critical, but often overlooked, body of information - it can help you begin to think about the values and motivations of the people in your watershed. **Table 2** (page 4) lists additional characteristics that you may want to consider, and the list below gives some ideas about where to start gathering information.

- [US Census American Fact Finder](#)
- [MN State Demographic Center](#)
- [USDA Economic Research Service](#)

## Getting to a quality plan

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At the end of this process, you should have a **detailed description of the watershed and its story**, giving the reader a clear picture of the characteristics that make the watershed unique. This description should also explain why the issues and actions identified in the plan are relevant and necessary. More detailed inventory information will allow you to be more accurate as you prioritize and target implementation.

The watershed story should explain the watershed's context – the geology, climate, and position in the basin. The main focus should be the major land uses, the people who are responsible for managing the land use, and the economy as a result. This information should appear in the appendix at a minimum, and could also be included in the executive summary and plan introduction sections. Include maps that support the story.



**Table 1.** Information types and sources to consider for plan content requirements for the Land and Water Resources Inventory.

| Plan Content Requirements  | Potential Information to Include   | Potential Sources   |
|--|--|---|
| <b>Topography, Soils, General Geology</b>  | <b>Topography:</b> LiDAR Elevations, Slope; <b>Soils:</b> Soil Texture (percent sand, silt, and clay), Crop Productivity Index, Forest Productivity, Hydric Rating, Wind Erodibility; <b>General Geology:</b> Bedrock, Surficial Geology, Karst Features, Mineral Deposits, Ecological Classifications | MN Geospatial Commons, NRCS Web Soil Survey, Unites States Geological Survey, MN Geological Survey  |
| <b>Precipitation</b>   | Normal Annual Precipitation and Temperature, Precipitation and Temperature Trends, Runoff Rates  | MN Climatology Office, National Weather Service, NOAA Atlas 14, Modeling (HSPF)   |
| <b>Surface water resources, including streams, lakes, wetlands, public waters and public ditches</b>   | Streams (perennial, seasonal), Lakes, Wetlands (current, historical), Public Waters, Public Ditches, Altered Watercourses, Hydrologic Position Index   | MN Geospatial Commons, MN Department of Natural Resources, Drainage Authorities   |
| <b>Groundwater resources, including groundwater and surface water connections if known</b>   | Groundwater Vulnerability, Springs, Recharge Areas, Depth to Water Table, Well Locations and Depths, Nitrate Levels, Aquifer Properties and Boundaries, Aquifer Water Level Trends, Direction of Groundwater Flow, Water Chemistry   | County Geologic Atlas, Regional Hydrogeologic Assessment, MN Geospatial Commons, MN Department of Agriculture Township Testing Program, MN Geological Survey, MN Department of Natural Resources, MN Department of Health |
| <b>Water quality and quantity, including trends of key locations and 100-year flood levels and discharges, regulated pollutant sources and permitted wastewater discharges</b> | <b>Water Quality:</b> Impairments, Stressors, Trend Information, Regulated Pollutant Sources, Wastewater Treatment Plants; <b>Water Quantity:</b> 100-year Floodplain, Known Damages   | Watershed Restoration and Protection Strategies (and associated reports), MN Pollution Control Agency, MN Department of Natural Resources, Federal Emergency Management Agency  |
| <b>Stormwater systems, drainage systems and control structures</b>   | Stormwater Systems, Drainage Systems, Dams, Impoundments, Drain Tile Systems   | MN Department of Natural Resources, Watershed Districts, Counties, US Army Corps of Engineers, Cities   |
| <b>Water-based recreation areas</b>  | Parks, Public Accesses, State Water Trails, Public Beaches, Fishing Piers, Wildlife Management Areas, Waterfowl Production Areas   | MN Geospatial Commons, MN Department of Natural Resources, US Fish and Wildlife Service, Cities, Counties   |
| <b>Fish and wildlife habitat, rare and endangered species</b>  | Conservation Lands (public conservation lands, easements, etc.), Native Prairie, Important Wild Rice Areas, Tullibee Lakes, Designated Trout Streams, Rare and Endangered Species  | MN Geospatial Commons, MN Department of Natural Resources, US Fish and Wildlife Service   |
| <b>Existing land uses and proposed development</b>   | Land Cover (present and pre-settlement), Crop Data (types, average yields, irrigated/non-irrigated), Feedlots (type, animal units), Road Network, Impervious Surfaces, Landfills (active, closed), Subsurface Sewage Treatment Systems, Proposed Development   | MN Geospatial Commons, USDA Ag Census, MN Department of Natural Resources, MN Pollution Control Agency, MN Department of Agriculture, Counties, Cities  |

**Table 2.** Socioeconomic information that can be useful in the Land and Water Resources Inventory.

|                |                               | Source(s)   |
|----------------|-------------------------------|---|
| <b>People</b>  | <b>Population</b>             | Population size, U.S. Census Bureau, Population Estimates Program. Point-in-time estimate, as of July 1st   |
|                | <b>Age distribution</b>       | Sex by age, 2011-2015 American Community Survey 5-year estimates  |
|                | <b>Educational attainment</b> | Educational Attainment: population 25 years and older (U.S. Census Bureau)  |
|                | <b>Employment by industry</b> | Industry by occupation for civilian employed population 16 years and over, 2011-2015 American Community Survey 5-year estimates                                   |
|                | <b>Income</b>                 | Per capita income, 2011-2015. U.S. Census Bureau, American Community Survey   |
| <b>Economy</b> | <b>County economic base</b>   | U.S. Department of Agriculture, Economic Research Service, County Typology Codes, using data from the Bureau of Economic Analysis and the U.S. Census Bureau      |
|                | <b>Land ownership</b>         | Minnesota Geospatial Information Office, County recorders, assessor's, or land surveyor's offices. Some Minnesota counties provide their parcel data sets online. |