

Land cover changed; why does it matter?

It matters because land cover impacts the way a watershed functions. Changes in cropping systems, new areas of development, expanding forest harvest and draining wetlands are examples of actions that change land cover and impact watershed health. The 5-component framework can refine your approach for evaluating the impact of these changes.



Biology

Land cover provides habitat. As land cover changes, its value as habitat for plants and animals shifts to something different. Sometimes a change can provide better habitat, but most often it shifts to something less diverse and less desirable for Minnesota's native plants and animals. Less available quality habitat eventually leads to a decline in biodiversity and isolated populations that have reduced resilience to change or stress.



Connectivity

Connections occur throughout our natural systems. Picture a stream as it flows through a forest or prairie. There are important habitats within that stream, along the streambanks and across the uplands. Together this mosaic of habitats provides for the needs of the plants and animals that have adapted to living in that landscape. When the type of vegetation changes, it affects the mosaic of habitats but also the flow of water off the land, the absorption and flow of energy, the way carbon is stored and the movement of nutrients.



Hydrology

Land cover and the movement of water are intimately connected. The historic landscape had a natural balance that held and released water under different seasonal and rainfall conditions. As land cover shifts from natural vegetation to urban and agricultural uses, the hydrologic cycle is altered. The pattern of seasonal and annual water flows shifts in response. Draining or paving over places that historically stored water further increases the amount of water sent downstream. Natural and human systems receive more surface water which can make storm events more impactful.



Geomorphology

From small streams to major river basins, our rivers have adjusted their shape in response to the altered inputs of water, sediment and energy. The loss of perennial vegetation forces our rivers to adjust to more water and higher sediment loads. The shift has created many stream channels that are deeply incised and less able to interact with their natural floodplain. This unbalanced system delivers more sediment and water downstream, creating a cascade of impacts.



Water Quality

Urban and agricultural activities have direct impacts on water quality. Higher stream flows may mobilize more sediment and other contaminants, leading to impaired water quality and degraded aquatic habitats. Tile lines are used to convert wetlands to other uses. This drainage system below the surface bypasses the natural filtration of the soil profile, further increasing the chance for contaminants to reach our rivers and lakes.