— FORECASTING TOOL —

MFGA AQUANTY

# grasslander

FALL 2023

Forecasting Tool Solutions

Water Course

Dry Times, Furrowed Brows

Manitoba forage & grassland Association

# Water Course

Manitoba Forage and Grassland Association (MFGA) believes we need to start significantly addressing the future around our waters, our grasslands and natural areas by specifically planning around our water resources and rewarding farmers with incentives for ecological goods and services (EG&S) for society-benefitting water, soil, carbon and biodiversity gains on our ag lands.

According to the Manitoba Conservation Trust Spring 2024 guidelines, ecological goods and services are the conservation benefits that come from healthy ecosystems, including clean water and air and enhanced biodiversity. EG&S can include market goods produced from ecosystems (commodities, food, and fiber) improved wildlife habitat, benefits from ecosystem processes, including water purification or carbon storage and other values such as improving recreational opportunities.

Most certainly, EGS is not a new topic. The vast potential based on what we already know about somehow needs to evolve into proactive planning some time soon. Models, research, and farmers all seem on common ground, ready for more direction, engagement, and advancement of the concept. EGS promotes systems thinking rather than single-focus solutions.

Thanks to funding provided via the Canadian Agricultural Partnership via Agriculture and Agri-Food Canada and the Province of Manitoba as well as visionary partnerships with groups such as the Pembina Valley Watershed District, The MFGA Aquanty Model and Forecasting Tool gives us all the opportunity to work and plan together exactly like that with farmers and their farmlands at the forefront of solution providers. The vast potential based on what we already know about EG&S somehow needs to evolve into proactive planning some time soon.

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# What the Leaders are Saying

"Manitoba farmers know firsthand the impacts of climate change and severe weather conditions that continue to threaten their livelihoods. This new forecasting tool will help farmers and stakeholders plan ahead and make informed decisions to better manage these risks and increase resiliency across the Assiniboine River Basin and the Pembina Valley Watershed District."

**Hon. Marie-Claude Bibeau,**
***former Agriculture and Agri-Food Minister***

"Your Aquanty platform is so impressive...We were really pleased to learn about the platform from someone at your booth during Ag Days this past January. We need more tools like that in Manitoba to guide water strategy decisions"

**Jacqueline Keena,**
***P.Ag. Managing Director, Enterprise Machine Intelligence & Learning Initiative (EMILI)***

"We will work closely with stakeholders and water-focused groups to ensure all audiences are aware of this powerful water decision-support tool in the Assiniboine River Basin and the Pembina Valley watershed. We want to ensure farmers and stakeholders will be able to use it to the best of their ability."

**Lawrence Knockaert,**
***MFGA chair and dairy farmer from Bruxelles, MB***

"The ability to access this tool will be a valuable asset to have on so many levels, from farming to wetland conservation to infrastructure decisions. From a planning perspective, once we all get up to speed on what the tool can exactly do and tell us, we will have access to a database around water movement and water resources that we have never had before."

**Ryan Sheffield,**
***Pembina Valley Watershed District Manager***

## MFGA AQUANTY FORECASTING TOOL:

# Speaking the Water Language

### Streamflow

Streamflow refers to the volume of water that is moving through a river or stream over time. It is measured at gauge stations throughout the Assiniboine River Basin. This forecast will be made available as a time series graph for each station where it is measured. Large increases in forecasted streamflow can allow producers to foresee flood potential before it happens, whereas forecasted low flow conditions can give an idea of how long dry conditions may persist.

### Soil Moisture

Soil moisture readings are a measure of how saturated the soil is with water. Depending on the types of crops and soil present, soil moisture levels will respond differently to weather conditions. This forecast can help producers get a sense of future field trafficability and growing conditions.

### Groundwater levels

Groundwater levels are measured at stations throughout the Assiniboine watershed. A time series graph of both observed levels and forecasts will be available. Higher groundwater levels mean that more water resources may be available for use.

### Depth to groundwater

Depth to ground water is how far down from the ground surface you would have to dig before finding the top of the water table. This forecast will be available as a map. A shallower depth to groundwater means that the water table is closer to the surface. Forecasted changes to groundwater indicate how the groundwater system is anticipated to change in response to weather conditions.

### Water depth

This is the depth of water anticipated to be sitting on the ground surface. This forecast will be available as a map and can tell producers if they should expect increased or decreased ponding within surface depressions on their land.

### Exfiltration

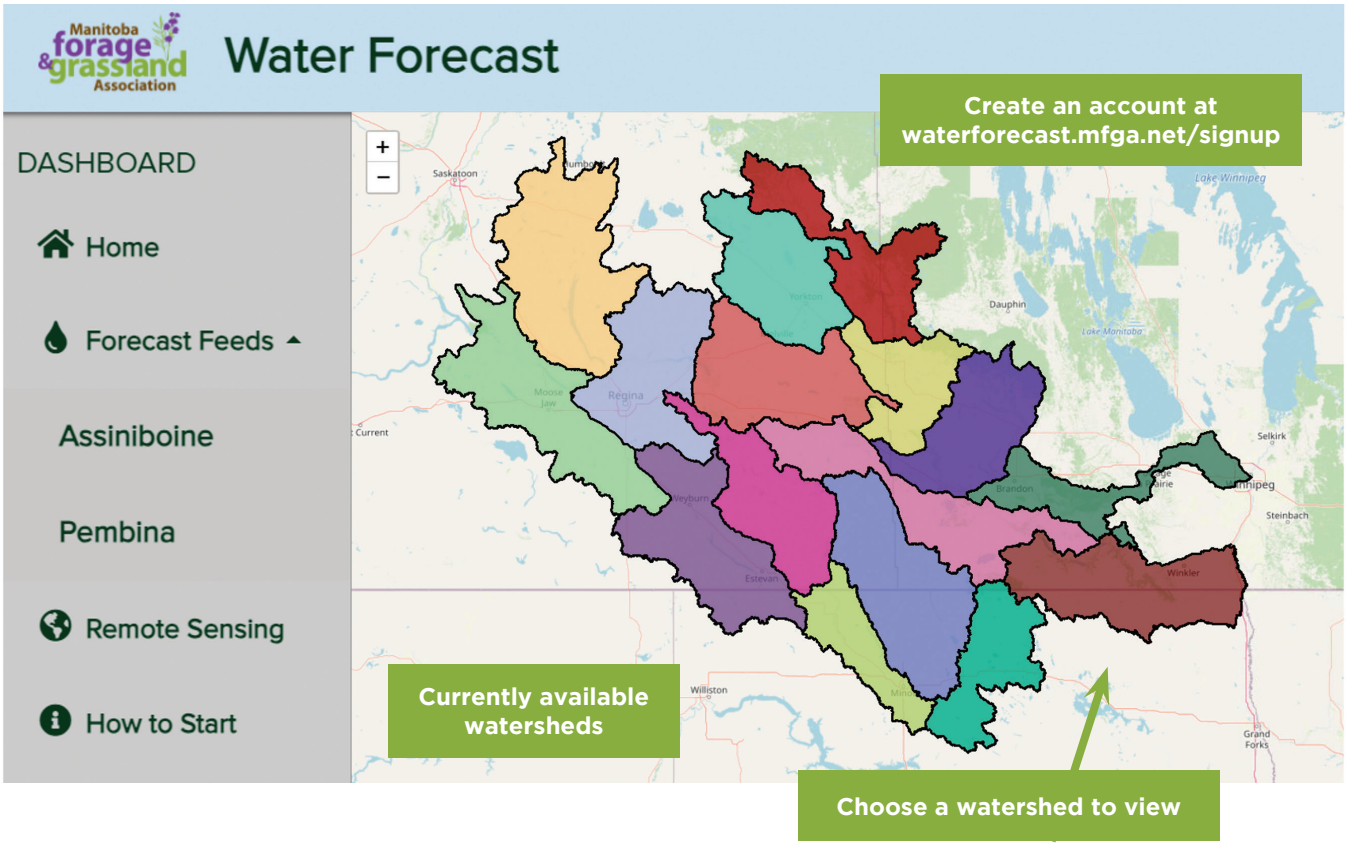
Exfiltration refers to the flow of water from the groundwater system into surface water features. Exfiltration is typically highest in and around streams or waterbodies where groundwater is discharging. This forecast will be available as a map. If exfiltration is predicted in the forecast for an area of land, then there could potentially be groundwater seepage occurring at the surface in these locations resulting in wet conditions.

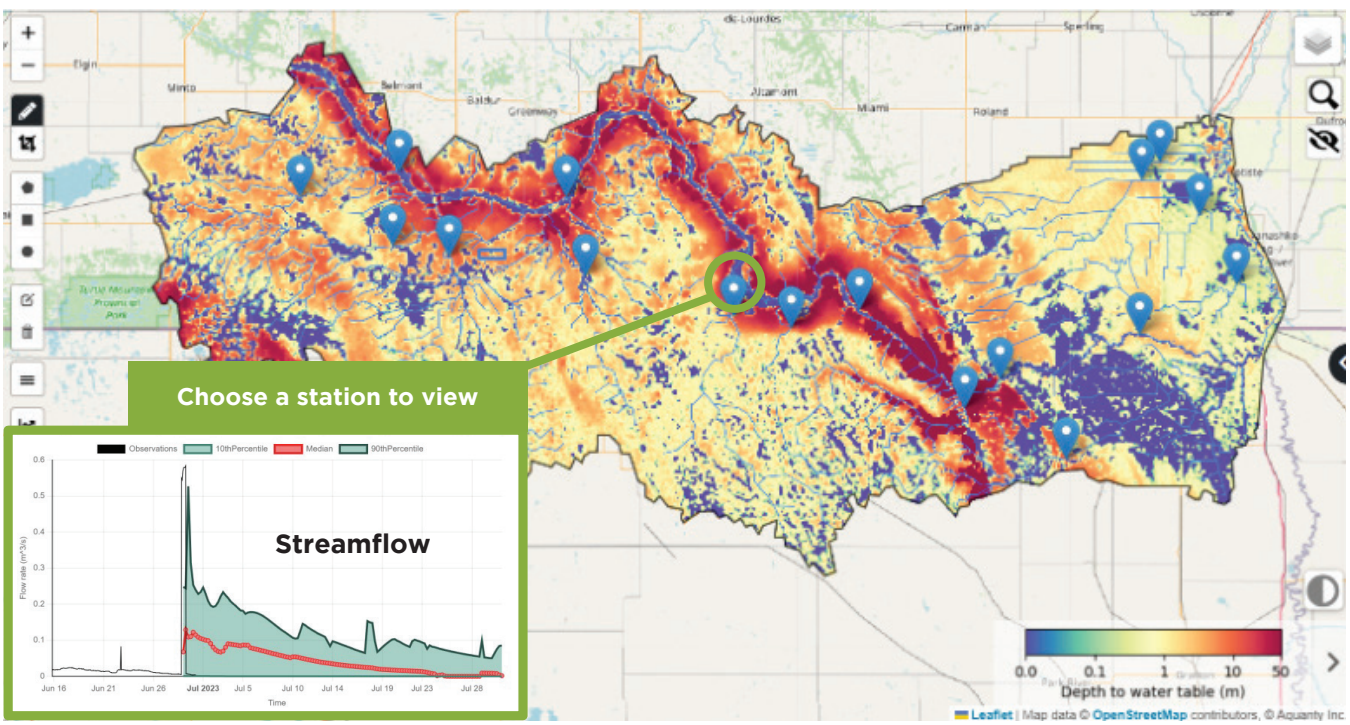
### Recharge

Recharge or groundwater recharge refers to the amount of water that is moving from the surface to the water table. It is important to manage groundwater recharge so that water is available during times of low rainfall and drought. The amount of recharge that occurs is going to be affected by rainfall, vegetation, and the physical properties of the soil and topography.

**All locations in the Assiniboine and Pembina watersheds have 7-day and 32-day water forecasts for:**

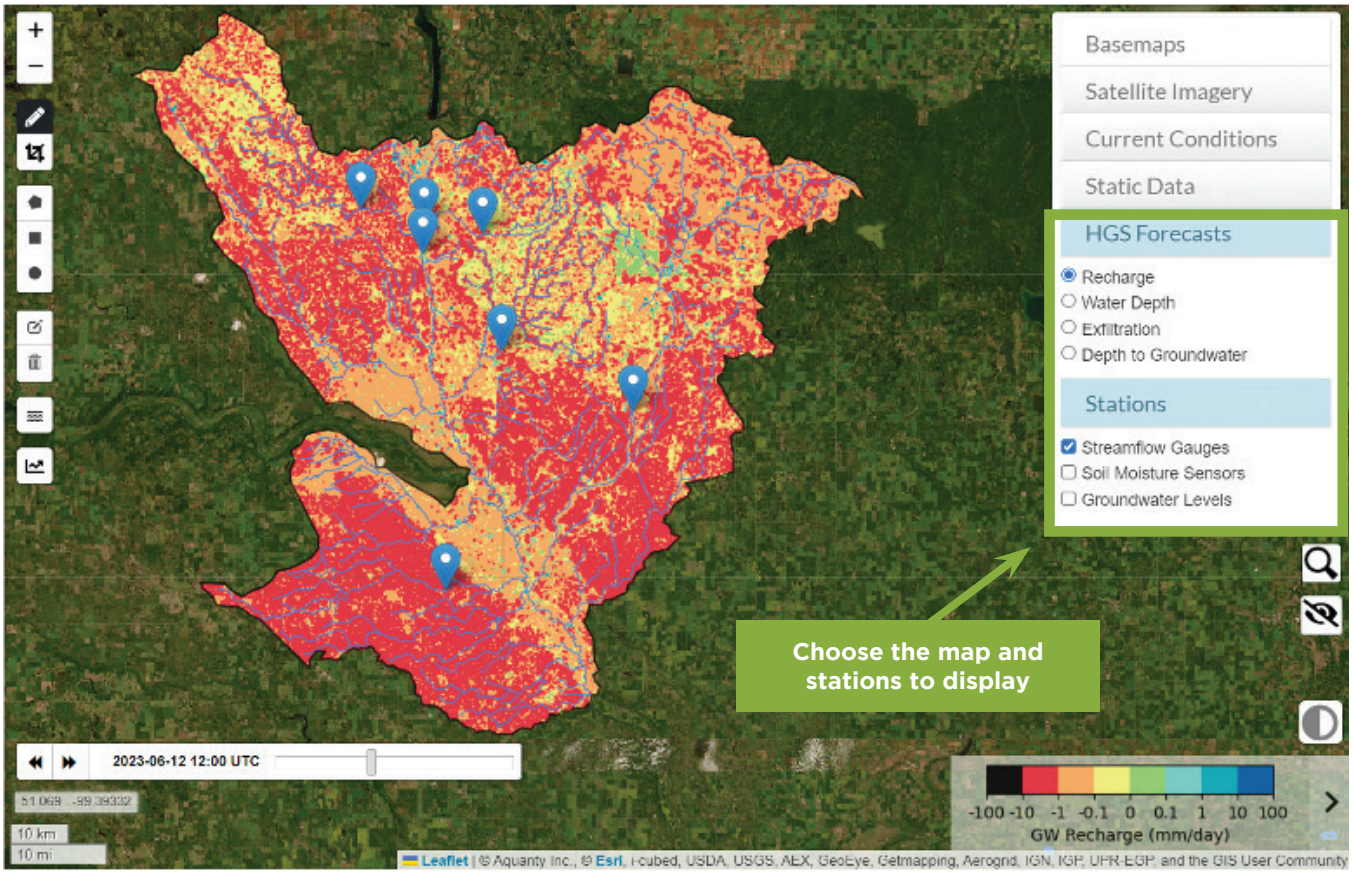
- Depth to Water Table
- Groundwater Recharge
- Groundwater Exfiltration
- Soil Moisture
- Water Depth

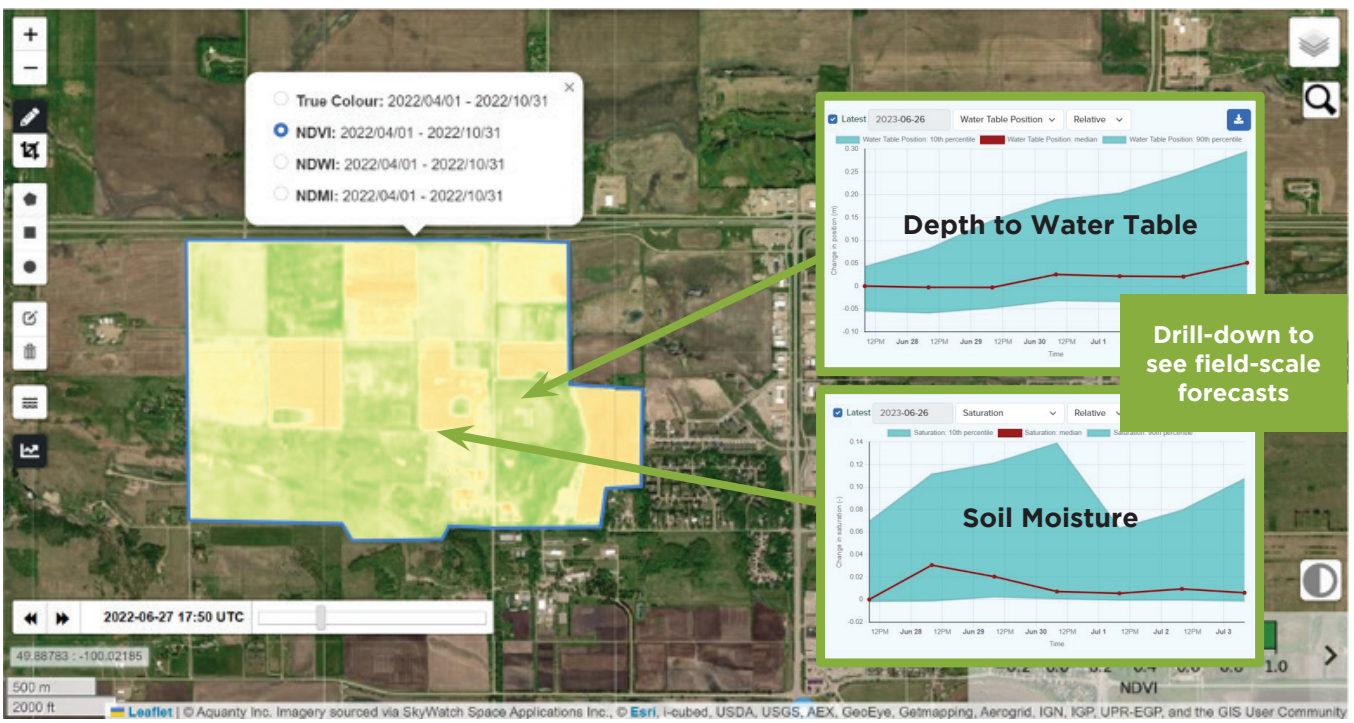


**Station locations show:**
- Forecasts
- Observation Data
- Satellite Imagery
- Carbon Calculator

**Create your own areas of interest to access:**
- Precipitation Tracker
- AAFC Agroclimate Data



# Dry Times, Furrowed Brows

BY DUNCAN MORRISON

One by one, they used different words to tell the same tale. But the worry was evident across the board.

"Dry....", said one about the family dairy farm north of Minnedosa. "...starting to get really worried...."

"Grasshoppers already...full of them...clouds of them as you walk forward...," chimed in a beef producer from the already semi-arid lands near Glenboro.

"Neighbour a couple miles over got smoked by a rain storm the other day," added a mixed farmer from Strathclair area. "We got a couple drops only, not nearly what we hoped or thought we'd get... guess I can't complain compared to some of the others here but... We sure do need more rain..."

They, in this case, were members of the MFGA board sharing small talk chit-chat updates before a mid-June 2023 mixer organized to introduce them and bird surveyors from the Province of Manitoba and Birds Canada.

While at that time, some areas of the province were moist and fine, and maybe even hit by rain in the near future on the whole, things were dry. Provincial precipitation maps are coming in below 50 percent normal precipitation May 1- June 11, 2023 with a wide swath of darkest, driest brown colour right across the middle of the province from border to boreal.

While we got through the growing season and Harvest 2023 with the benefit of a long frost free, damp, mild fall season, farmers are worried. Which in a big picture way makes one wonder why water management, water retention and water conservation are not higher priority among, well, everyone.

Across the board, projects and programming and other similar efforts primarily aimed at carbon always include water benefits as a key outcome. But are we emphasizing the water-boosting, farm-benefiting abilities of these programs and practices enough? Is it because, on even our driest day, we are only tomorrow away from the next all out soaker that we are hoping for and need?

As we take prescribed steps to sequester carbon and work toward Canada's commitment on climate change and implement carbon-storing BMPs is it perhaps time to really accelerate and increase awareness around the good of these practices for our water resources ,and by doing so, actually help position the carbon sequestration efforts even more solidly?

And, while flood is so crushingly visual for those hit by excess water, is avoiding drought impacts and planning years out one of the underlying largest benefits of the MFGA Aquanty Forecasting Tool across the Assiniboine River Basin in Manitoba and Saskatchewan and the Pembina Valley Watershed in the Red River Basin of Manitoba

**"We got a couple drops only, not nearly what we hoped or thought we'd get... guess I can't complain compared to some of the others here but... We sure do need more rain..."**

**— MGFA Board Member**

Around our MFGA board table, we talk often - and rightfully so -about the role healthy soils play for all of us, and in fact, have played in civilization. Time and time again, we bring forward the fact that the healthiest of soils can be water-saturated and water-friendly in slowing and stowing water flows and increasing water absorption. And we also talk about how if we manage the soil for water needs of the farm, the carbon storage potential increases via most soil-friendly practices.

The MFGA Aquanty Model and Forecasting Tool gives us the opportunity to work together exactly like that with farmers and their farm lands at the forefront of solution providers.

# Water Always Wins

"We tend to see water as a thing, either a commodity or a threat. So much of our development has been about subverting water's natural pathways and habits. That worked to a point. But now that we have more than eight billion people, with 75 per cent of the world's land area altered by human activity, the natural systems are breaking down. That's a big part of the reason we're seeing this increase in frequency and severity of flood and drought. Again and again we see that if you fill in a wetland and build something on top of it, that's often the first area to flood.

Water has relationships with soil and rock and microbes and beavers and people. Water has memory. Water goes where it wants to go. We think that we can control it, but that is an illusion. Our dominant culture has a single-solution focus, whether dam-building or piping in water or desalination, so we're ignoring these complex systems. And in doing that we're destroying them. We're undermining ourselves because these ecosystem services are doing so much for us."

Erica Gies, environmental journalist, National Geographic Explorer and author of *Water Always Wins: Thriving in an Age of Drought and Deluge* as quoted in an interview with The Tyee, September 2023

Manitoba Forage and Grassland Association (MFGA) has supported and provided strategic direction to the forage and livestock industry for over 30 years in Manitoba.
MFGA promotes the economic prosperity and environmental benefits of forages, grasslands, cover crops, and healthy soils to benefit our forage and grassland producers, local communities, and society. MFGA's vision is vibrant grasslands and prosperous forage crops on Manitoba's agricultural lands.

## Learn More About Our MFGA Aquanty Project

Do you have a model scenario that you're curious about? Contact us and lets get the conversation started!

**info@mfga.net** **@MFGAAquantyARB**

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