

How does “feature-based water balance” relate to other types of “water balance”?

- FBWB is distinguished from two other types of “water balance” that proponents may be required to satisfy as per TRCA’s Stormwater Management Criteria (2012): site water balance and groundwater recharge.
- The site water balance objective is to retain the first 5 mm of rainfall generated on-site which reduces impacts to erosion within a receiving watercourse, provides minor flood risk reduction benefits, improves water quality, and reduces related impacts to natural features.
 - The groundwater recharge objective is to mitigate the impacts of development on the regional groundwater system by maintaining annual recharge volumes in areas mapped as significant groundwater recharge areas.

(Note that there may be additional Clean Water Act provisions for protection of recharge pertaining specifically to municipal drinking water)
- These stormwater management objectives (site water balance, groundwater recharge, and feature-based water balance), where each applies, need to be satisfied independently. However, promoting retention of runoff during more frequent events can contribute to the satisfaction of all three objectives.

Where can I find more information and guidance?

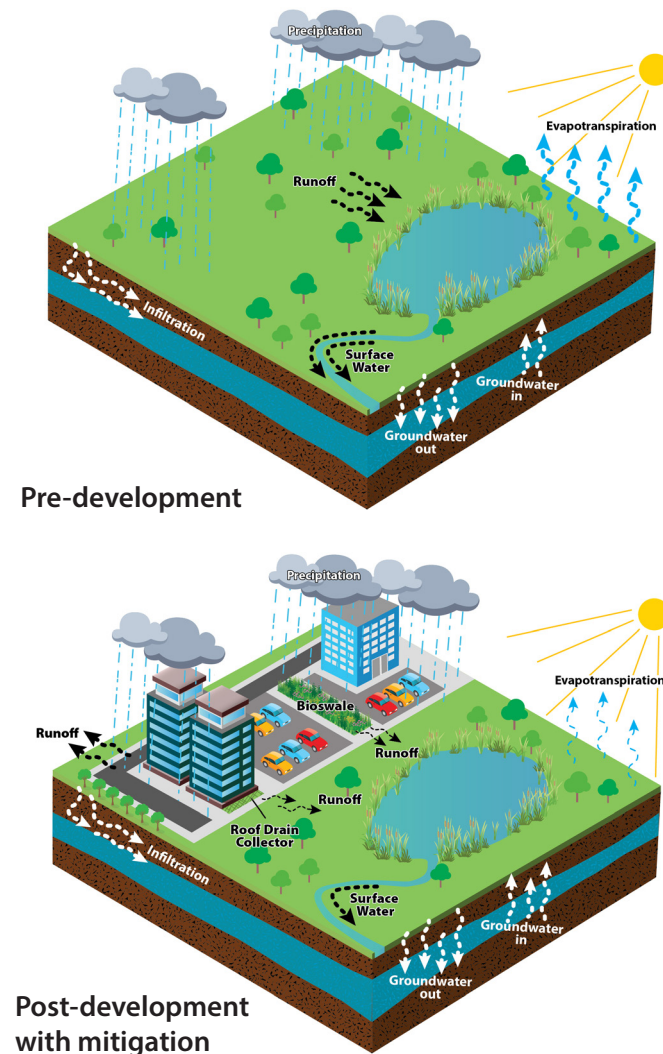
- More detailed guidelines and decision support tools are available to support proponents with hydrological monitoring, modeling, and other components of an FBWB study.
- The guideline documents below can be found at:
www.trca.ca/planning-permits/procedural-manual-and-technical-guidelines/
 - Stormwater Management Criteria (2012)
 - Wetland Water Balance Risk Evaluation (2017)
 - Wetland Water Balance Monitoring Protocol (2016)
 - Wetland Water Balance Modeling Guidance Document (2019)



FACT SHEET: FEATURE-BASED WATER BALANCE

What is feature-based water balance (FBWB)?

- Certain types of natural features, such as wetlands, may be significantly impacted by urban development and land use change even where no development activities occur within the feature itself.
- Changes to the land surface draining to a feature, known as its catchment, resulting from construction of impervious surfaces like asphalt and concrete or changes to the grade of the land surface, may alter the quantity and timing of water flowing to or from the feature.
- By altering the timing and quantity of flows to or from the feature, collectively referred to as its water balance, there is a risk that the feature will be degraded as it becomes too wet or too dry at the wrong time. This can result in loss of species or ecological function, as well as in potentially hazardous site conditions such as tree die-back or nuisance flooding of adjacent areas.
- Consideration of FBWB in development design reduces the risk of these types of negative impacts and helps fulfill the wetland conservation objectives outlined in the Provincial Policy Statement and in other provincial policy and legislation.



Below: Site where water balance was not given due consideration; pre-development (left) and post-development (right) at roughly the same time of year



Why does TRCA require feature-based water balance?

- Water balance is one of the four objectives outlined in TRCA's Stormwater Management Criteria (2012), along with water quantity (flooding), water quality, and erosion.
- TRCA regulates interference with wetlands under the Conservation Authorities Act and has documented many cases where lack of due consideration for FBWB led to significant degradation of natural features, as well as issues with erosion, nuisance flooding, tree die-back, and related hazards.
- Municipalities and the public have an interest in ensuring that lands that are set aside for inclusion in a natural heritage system can continue to function as viable habitat and provide the same level of ecological services to local residents (e.g. water filtration, heat island reduction, aesthetic appreciation, etc.) as part of a complete, sustainable community design.

What is involved in a feature-based water balance, and how do I know if I need to do one?

- The decision to require FBWB will first consider whether a natural feature is recommended for retention on the landscape, and if so, whether it is hydrologically sensitive. Wetlands and some types of woodlands and streams may be considered hydrologically sensitive (see section 6 of the Stormwater Management Criteria; TRCA, 2012).
- Development proponents are advised to complete the Wetland Water Balance Risk Evaluation (Risk Evaluation; TRCA, 2017) during preliminary submissions to determine whether FBWB will be required to inform development design.
- The Risk Evaluation considers likelihood of impact to a feature's water balance and its sensitivity to altered water balance. The Risk Evaluation is designed to be completed as a desktop exercise using existing data and proposed conceptual land use plans during early stages of the planning process.
- The Risk Evaluation determines whether pre-development hydrological monitoring is required and what level of modeling may be required to inform development design. Monitoring is required only where it is needed to calibrate a hydrology model. It is key that monitoring begin as early as possible to provide a high-quality baseline dataset (three years is the standard monitoring requirement).
- The purpose of modeling, where required, is to understand what the effect of the proposed development will be on the water balance of the feature and to explore design alternatives and adaptive management options that will mitigate any impacts identified through the review process.