

Wake Water Trend #4: Increased Pollution

Pollutants such as nitrogen, phosphorus and sediment in surface water runoff are expected to increase in Wake County.



Drivers and Expected Impacts

Pollution

Conversion of natural land to impervious surfaces such as roofs, roads and parking lots increases the amount of stormwater runoff. As stormwater runs over impervious surfaces, it carries pollutants like nitrogen, phosphorous, and sediment to local waterbodies. In addition, when a large volume of precipitation occurs in a short period, it does not have time to soak into the ground before becoming runoff, further reducing the infiltration and groundwater recharge.

Related Trends



Higher stormwater volume



More frequent flooding



Less baseflow



Less groundwater recharge

Future Trends

More extreme rainfall events are projected to increase stormwater runoff, and the associated pollutant loads during and after storm events. Future projections indicate that widespread land use changes will increase impervious surfaces and reduce infiltration, contributing to higher surface runoff loads of sediment, nitrogen and phosphorus loads throughout the County. The predicted water quality impacts vary by location and type of pollution; however, anticipated changes of future land use changes include (Tetra Tech and RTI 2025)¹:

- Large increases in pollution during and after storms.
- More pollutants expected from highly urbanized areas.
- Increases in peak streambank erosion loads on the day of a storm event.



Streambank erosion increases pollution from exposed sediment.
(Source: Wake County)

¹ Tetra Tech and RTI (Research Triangle Institute International). 2025. *Baseline Analysis Memorandum*. Report 2.3.5. Prepared for Wake County Government by Tetra Tech and RTI, Research Triangle Park, NC.