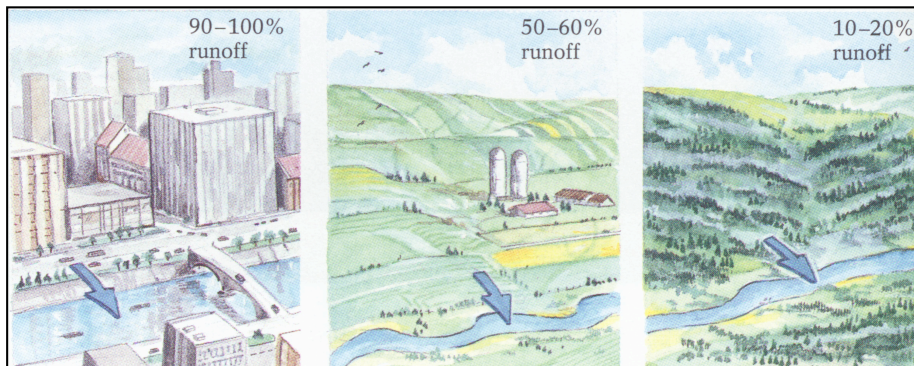


A Tool for Estimating the Impacts of Land Use Change on Water Resources: Long-Term Hydrologic Impact Assessment (L-THIA)

Bernard Engel (E-Mail: engelb@purdue.edu) and Jon Harbor (E-Mail: jharbor@purdue.edu), Purdue University

Difference in relative runoff due to land use differences.



L-THIA provides relative estimates of change in runoff and non point source pollutants due to land use change.



Multiple versions of L-THIA are available for use.

- The WWW (web browser) version allows any user to input local land use and soil information and receive results over the Internet.
- A WWW GIS version allows users to obtain watershed-level land use and soil data to automatically complete L-THIA data inputs
- The desktop GIS version automates the process of impact modeling within the ArcView GIS tool.

Purpose: Land use changes can significantly impact groundwater recharge, stormwater drainage, and water pollution. The Long-Term Hydrologic Impact Assessment (L-THIA) model was developed as an accessible online tool to assess the water quality impacts of land use change. Based on community-specific climate data, L-THIA estimates changes in recharge, runoff, and non-point source pollution resulting from past or proposed development. It estimates long-term average annual runoff for land use and soil combinations, based on actual long-term climate data for that area. By using many years of climate data in the analysis, L-THIA focuses on the average impact, rather than an extreme year or storm.

The model produces maps of runoff depth and volume along with non-point source pollution loading of the area.

Key Features:

- All versions model runoff and 14 non-point source pollutants in surface waters.
- Quick, user friendly tool to use in assessing the long-term impacts of land use change.
- An overview/screening model. Identifies need for more detailed modeling.

- Does not require detailed data input.
- Provides “what-if” alternatives evaluation scenarios.
- Provides a numeric description of runoff in tabular form, as well as graphical representations in charts and maps.
- L-THIA results can be used to aid land use planners.

Significance: As a quick and easy-to-use approach, L-THIA's results can be used to generate community awareness of potential long-term problems and to support planning aimed at minimizing disturbance of critical areas. L-THIA is an ideal tool to assist in the evaluation of potential effects of land use change and to identify the best location of a particular land use so as to have minimum impact on a community's natural environment.

FOR FURTHER READING:

Engel, B.A., (2001 Update), L-THIA NPS (Long Term Hydrologic Impact Assessment and Non-Point Source Pollutant Model, Version 2.1A), Purdue University and U.S. Environmental Protection Agency.

Also see <https://engineering.purdue.edu/mapserve/LTHIA7/>