Baltimore Ecosystem Study, Long-Term Ecological Research

Start Date: July 1, 1998

End Date: Ongoing

Partners: Cary Institute of Ecosystem Studies, Millbrook, NY; University of Maryland Baltimore County, Center for Urban Environmental Research and Education; and the National Science Foundation.

Project Chief: Ed Doheny

Background: The National Science Foundation's Long-Term Ecological Research (LTER) Network was created in 1980 and seeks to understand how specific ecosystems change over time. For more than three decades, the LTER Network has generated rigorous, site-based scientific research that has led to important findings on both regional and continental scales. Prior to 1998, most LTER research sites had been focusing efforts on undisturbed watersheds and ecosystems, and little, if any, LTER research had focused on urban ecosystems. Beginning in 1998, Baltimore became one of two urban LTER project locations to be added to the national network of LTER sites.

Objectives: The goal of the Long-Term Ecological Research, Baltimore Ecosystem Study (BES) is to explore, quantify, and document knowledge of urban ecosystems, with primary focus on the Baltimore Metropolitan Statistical Area, and with intensive plots situated in the Gwynns Falls Watershed.

BES collects long-term data on urban ecosystem structure, function and change. It also conducts research to improve understanding and application of the concept of sustainability to an urban system, based on testing hypotheses concerning the social and bio-geophysical processes in Baltimore that can help achieve local sustainability policy.

The research employs complementary strategies of experimentation, comparison, long-term measurement, and modeling. Models of feedback between social and bio-geophysical processes linked through ecosystem services of water quality and flow, and net carbon storage place the variables and spatial patterns measured in a practical context.

Approach: The current USGS role in BES is to (1) operate and maintain four continuous-record streamflow gages in the Gwynns Falls watershed, and two streamflow gages in the Oregon Ridge area of Baltimore County, along with data analysis, interpretation, and publication of streamflow records; and

(2) to conduct and collaborate on selected interpretive investigations to develop an understanding of the hydrology of urban watersheds.

Results: Streamflow gages operated in support of BES include the following:

a. 01583570, Pond Branch at Oregon Ridge, MD (January 1983—September 1986, April 1998—present)
b. 01583580, Baisman Run at Broadmoor, MD (August 1964—September 1969, October 1970—September 1976 (annual maximums), November 1999—present)
c. 01589180, Gwynns Falls at Glyndon, MD (October 1998—present)
d. 01589238, Gwynns Falls Tributary at McDonogh, MD (November 1999—present)
e. 01589300, Gwynns Falls at Villa Nova, MD (February 1957—September 1988, October 1996—present)
f. 01589352, Gwynns Falls at Washington Blvd. at Baltimore, MD (October 1998—present)

Publications:

Doheny, E.J., 1999, Index of Hydrologic Characteristics and Data Resources for the Gwynns Falls Watershed, Baltimore County and Baltimore City, Maryland: U.S. Geological Survey Open-File Report 99-213, 17 p. Available online at: http://md.water.usgs.gov/publications/ofr-99-213/

Doheny, E.J. and Fisher, G.T., 2007, Hydraulic geometry characteristics of continuous-record streamflow-gaging stations on four urban watersheds along the main stem of Gwynns Falls, Baltimore County and Baltimore City, Maryland: U.S. Geological Survey Scientific Investigations Report 2006-5190, 24 p. Available online at: http://md.water.usgs.gov/publications/sir-2006-5190/index.html

Groffman, P.M., Band, L.E., Belt, K.T., Bettez, N.D., Bhaskar, A., Doheny, E.J., Duncan, J.M., Kaushal, S.S., Rosi-Marshall, E.J., and Welty, C., Chapter 12: Applying the watershed approach to urban ecosystems in Baltimore: Baltimore Ecosystem Study Synthesis Volume, in press.

U.S. Geological Survey, Annual Water Data Reports: http://wdr.water.usgs.gov/

For Additional Information:

Baltimore Ecosystem Study project website: http://www.beslter.org/

Cary Institute of Ecosystem Studies: http://www.caryinstitute.org/

UMBC Center for Urban Environmental Research and Education: http://www.umbc.edu/cuere/

The Long Term Ecological Research Network: http://www.lternet.edu/

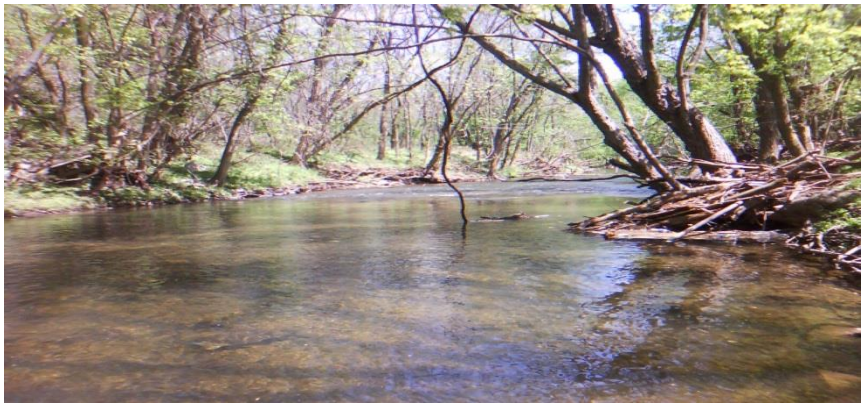
Pictures:

01583570, Pond Branch at Oregon Ridge, MD

01589238, Gwynns Falls Tributary at McDonogh, MD

01583580, Baisman Run at Broadmoor, MD

01589352, Gwynns Falls at Washington Boulevard at



01589300, Gwynns Falls at Villa Nova, MD