

APPALACHIAN LANDSCAPE CONSERVATION COOPERATIVE GRANT 2012 PROGRESS REPORT

Quarter: (circle one) 2012 1st 2012 2nd 2012 3rd 2012 4th

Grant Number and Title: 2012-03, Development of a hydrologic foundation and flow-ecology relationships for monitoring riverine resources in the Marcellus Shale region

Grant Receipt/Organization: New York Cooperative Fish and Wildlife Research Unit, B02 Bruckner Hall, Cornell University, Ithaca, NY 14853

Grant Project Leader: William L. Fisher, wlf9@cornell.edu, 607-255-2839

Were planned goals/objectives achieved last quarter? Yes

ALCC Need Addressed: Inventory and review of ecological flow models and monitoring networks with applicability to Appalachian watersheds

Progress Achieved: (For each Goal/Objective, list Planned and Actual Accomplishments)

Goal 1: Determine what ecological flow models that predict both low and high flows and are in use or are applicable to the Marcellus Shale region.

Objective 1: Literature review of hydrologic models currently used within the Marcellus Shale region.

Accomplishments.—A general review of environmental flow literature was conducted; however, the review did not focus specifically on hydrologic models. The Baseline Streamflow Estimator (BaSE) tool was released by USGS at the end of September 2012. The tool estimates baseline streamflow for ungaged streams in Pennsylvania using data collected from reference gages during water years 1960-2008. The tool was developed by the USGS in cooperation with Pennsylvania Department of Environmental Protection, Susquehanna River Basin Commission, and The Nature Conservancy. This tool is also being developed in New York with an additional feature of being able to add water use data to the model and predict baseline versus altered flows. This tool represents a good candidate model for estimating flow and we will be working with partners to test the Pennsylvania and New York tools in the coming months. We will also intensify our literature review and coordination with users and developers of this model and other potential tools in the coming months.

Objective 2: Development of geo-referenced stream gage database.

Accomplishments.—We have assembled a list of gaged streams and developed GIS layers for sites that overlap with the Marcellus Shale region. In total, there are 495 sites with USGS gage data in the study area (Figure 1). One hundred twenty-nine of those sites have been classified by USGS personnel as least-altered or reference sites. We are currently in the process of downloading data and using the Hydrological Integrity Tool (HIT) to calculate 171 flow statistics for each site. Additional information that may be useful in building our reference gage database for stream classification include modeled daily flows using the tools mentioned above for areas lacking data and other gages that regional experts may consider least-altered.

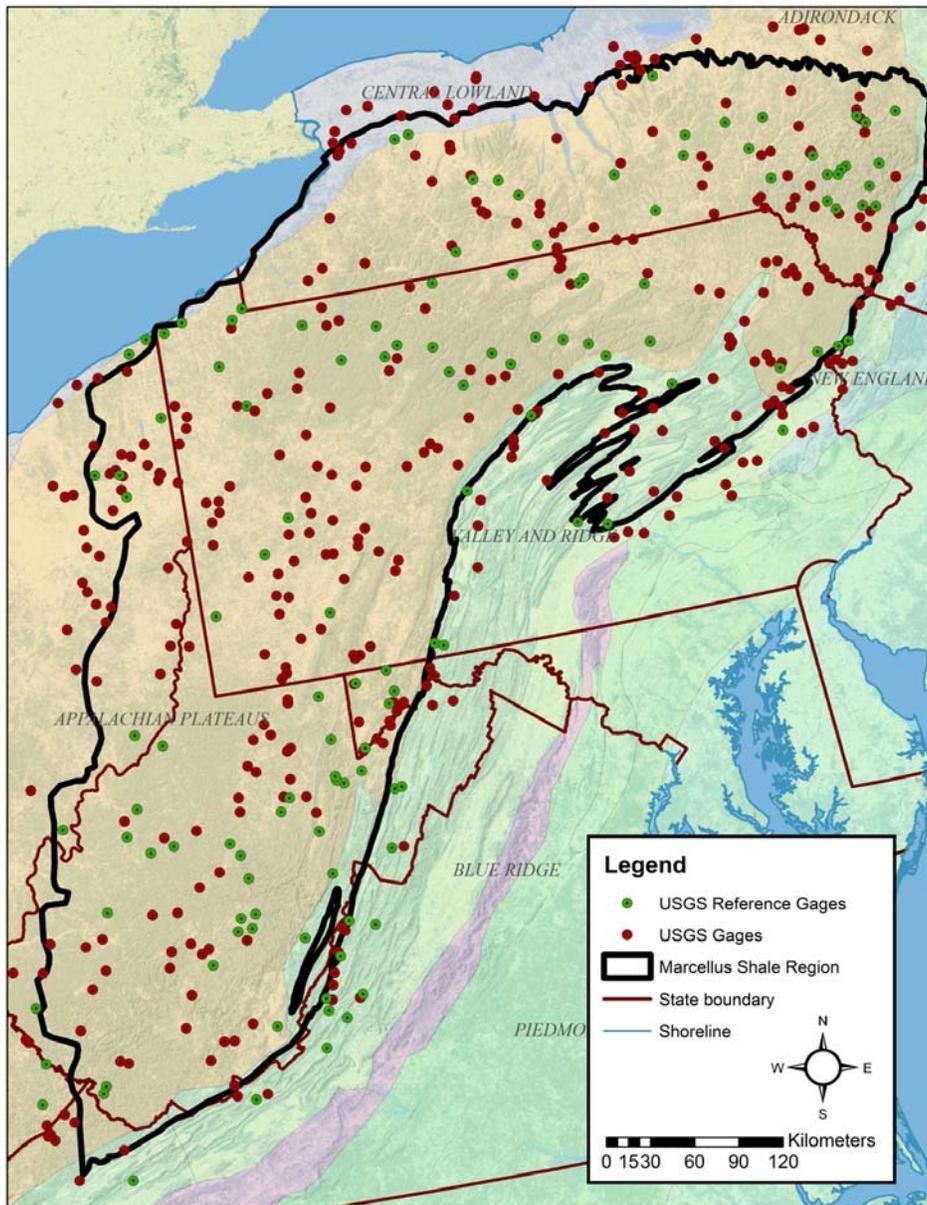


Figure 1. Map of the Marcellus Shale region in the northeastern United States showing the location of USGS stream gages including reference gages.

Objective 3: Contact and coordination with users and developers of stream flow modeling tools.

Accomplishments.—We are also currently building collaboration around stream classification data and techniques with Dr. Ryan McManamay at the Oak Ridge National Laboratory. Ryan has experience developing regional stream classifications and is currently developing a new reference gage database that includes pre-alteration data from a significant number of gages that are considered altered. This sort of data may prove useful for adding additional un-altered hydrologic datasets to the flow classification, and for testing how well streamflow metrics calculated from modeled daily flows line up with gage data not used in the hydrologic models.

Objective 4: Development of geo-referenced stream biological database for the Marcellus Shale region.

Accomplishments.—We have only acquired stream fish data for New York. In the coming months we will increase efforts to acquire macroinvertebrate and fish data from Pennsylvania and West Virginia state agencies.

Summary of Progress: (Provide a paragraph describing progress, work to come, and timelines)

The goal of this phase of the project is to determine what ecological flow models that predict both low and high flows and are in use or are applicable to the Marcellus Shale region. We have four objectives to accomplish during this phase. Objective 1.—Progress includes obtaining the Baseline Streamflow Estimator (BaSE) tool for Pennsylvania. During the next quarter (2012 3rd quarter), we will continue conducting a literature review with a focus on hydrologic models that are currently or could be used within the Marcellus Shale region. This work will be completed by the end of the quarter. Objective 2.—We assembled a list and mapped 495 stream gages in the Marcellus Shale region. In the next quarter, we will download these data and begin analyzing them. Objective 3.—We are collaborating with Dr. Ryan McManamay on developing a regional stream classification for the Marcellus Shale region. We will continue building collaborations in the next quarter. Objective 4.—We have acquired fish data for streams in New York state. During the next quarter, we will identify fish databases for Pennsylvania and West Virginia.

Difficulties Encountered: None.

Activities Anticipated Next Quarter:

Expected End Date: 30 April 2014

Costs:

Funds Expended to Previous to this Report: \$0

Amount of ALCC Funds Requested within this Report: \$11,518

Total Approved Budgeted ALCC Funds: \$153,206

Are you within the approved budget plan? Yes

Are you within approved budget categories? Yes

Signature: William L. Fisher

Date: 10/15/2012