February 13, 2014

Title: USGS Pilot Studies to Map Floodplains and Assess their Ecosystem Functions in the Chesapeake Bay watershed

Issue: The Chesapeake Bay Program Partners have expressed interest in adding new "land uses" to the proposed Phase 6 watershed model. The list of potential land uses includes: riparian forests, wetlands, floodplains, and urban stream corridors. These features are sources and/or sinks of nutrients and sediments and both affect and are affected by land uses and management actions in the watershed. These features perform a variety of ecosystem functions and provide valuable ecosystem services such as water quality protection (e.g., nutrient and sediment removal, retention, and transformation functions), flood protection or attenuation, wildlife habitat, and recreation. Including these features in the Phase 6 model will better represent the effects of Best Management Practices and other restoration actions on nutrient and sediment loads to the Chesapeake Bay. Assessing and valuing the ecosystem services associated with these features can inform local and regional watershed restoration and protection plans.

The USGS is funding a pilot study to map the following landform features: floodplain extent and width, levees, terraces, wetlands, toe slopes, channels (order, magnitude, width, depth, hydraulic radius, slope, and sinuosity), ratio of channel width to floodplain width, and land cover. These features will be mapped at multiple resolutions in small watersheds where existing field measurements exist for validation. Data used for mapping will include FEMA floodplain maps, SSURGO soil attributes, National Wetlands Inventory, Land Cover (e.g., GAP, NLCD, SWAP priority species habitat), stream gauge records, and bare-earth Digital Elevation Models at multiple raster resolutions: 1m, 3m, and 10m.   Data used for validation include measured floodplain elevations, stream cross-sections, inundation frequency and duration, and sediment trapping/retention rates.

The USGS is seeking support for a follow-up pilot project to assess and value ecosystem services provided by the floodplain landform features. USGS proposes to use a portfolio analysis model or the Integrated Valuation of Ecosystem Services and Tradeoff (InvEST)[1] model together with economic benefit transfer methods to assess the ecological functions and socioeconomic values of the floodplain features. The ecological and socioeconomic information may be used together to help visualize tradeoffs in support of informed decision making. The estimated cost for this ecosystem services pilot is $54,000. Critical components of both pilot studies are to assess the feasibility of expanding them to the entire Chesapeake Bay watershed.

Status: The floodplain mapping pilot study is scheduled for March - July 2014. If funded, the ecosystem services pilot study will be initiated in September/October 2014 and continue through April 2015.

Relationship/connection to the Habitat GIT:
Improve consistency between Habitat GIT goals, the Bay TMDL and Watershed Implementation Plans. Inform local watershed restoration and protection decisions.

Feedback and Collaboration:
Yes please.

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[1] http://www.naturalcapitalproject.org/InVEST.html