**Appalachian LCC Science Needs Portfolio**

**Top Ranked Science Needs – 2011 Workshop**

**And RFAs issued February 2012**

**Ranked #1. [Ecological flows, Species-Habitat Relationships at Multiple Scales & Effects of Alterations] (**Assemble the necessary scientific information or conduct the necessary studies required to develop a) (r)igorous understanding of the relationships among ecological flows and hydrology (discharge, seasonal, etc.), habitat (temp, geology, physical space, etc.), and aquatic biota/communities (in order) to assess how alterations to systems will affect their sustainability.

**RFA Project Description and narrative excerpts:** Inventory and review of ecological flow models and monitoring networks with applicability to Appalachian watersheds. Includes an assessment of suitable hydrologic/ecological flow models and data, and application of suitable models to the region.

**RFA Project Description:** Development of a stream classification system compatible throughout the Appalachian LCC as a platform to study ecological flow issues

**Ranked #2.** [**Resource extraction & demands for energy] (**Using a suite of analytical tools,) **(**f)orecast future spatial footprint of energy production, mineral extraction, and associated infrastructure/transmission/transportation in coming decades (in 20 years) in light of changes to demand, technology, policy, and regulation, including econometric models to better understand the impacts on resources (species and habitats).

**RFA Project Description and narrative excerpts:** Forecast future spatial footprint of energy production across the Appalachian LCC region. This project will use a suite of analytical tools to integrate relevant information in the creation of model(s) to forecast the future spatial footprint of energy production, mineral extraction, and associated infrastructure/transmission/transportation in coming decades (in 20 years) in light of changes to demand, technology, policy, and regulation, including econometric models.

**Ranked #3.** **[GIS/IT Capacity]** – (Based on the input provided by a GIS/IT Working group assembled by the LCC): design pilot study or use case studies (1) to define the necessary architecture (to support the work and products of the LCC community); (2) identify hardware, software, functionality and staffing needs; and (3) makes recommendations to steering committee for allocating resources for architecture needs.

**Ranked #4.** **[Species/habitat distribution trends (includes all terrestrial habitats =** forests, open land and wetlands**)]** Understanding representative/priority/focal species and population distributions (all terrestrial – forests, open land and wetlands) across the region, their habitat relationships, and effective movement/dispersal linkages. [Recommendation/Approach: find representative species for habitat and migratory relationships - can’t do every species (ex. amphibians as potential representative species)]

 **RFA Project Description:** Landscape-scale maps of terrestrial habitat and ecosystems based on a common mid-level classification framework for the Appalachian LCC region.

 **RFA Project Description and narrative excerpts:** Survey inventory & distribution mapping of rare, threatened, endangered, and endemic species across the Appalachian LCC. The Appalachian LCC partners need a complete list of priority conservation units (i.e., species, populations, genetic stock) throughout the LCC to develop a comprehensive geo-referenced database that categorizes these priority conservation units based upon individual state, as well as Federal, designations.

**Ranked #5.** **[Vulnerability assessments (climate and non-climate stressors)]** Support multi-scale vulnerability assessments (that incorporate species-specific physiological data) to identify habitats and species that would be most vulnerable to climate change in the LCC, especially range-limited/endemic species. [Collate/compile ‘meta-analysis’ of vulnerability assessments done by states and other partners. (Do not) reinvent wheel. Learn from what has been done, what can be improved on, gaps filled, build on existing foundation (e.g., how to adjust populations models.) USFWS has done some of this meta-analysis, but focused more on T&E. Making sure it is heavily coordinated with Climate Science Centers *(reworded)*.]

 **RFA Project Description and narrative excerpts:** Understanding Land Use and Climate Change in the Appalachian Landscape; This project will: (a) review and evaluate the methods to determine the best methodology available for vulnerability assessments in the Appalachian LCC and share the process and outcomes with LCC partners and other stakeholders