**DRAFT**

# Action Plan to Compile Existing Data for Evaluating Coastal Plain Ecological Flows in APNEP Region.

APNEP Flows Action Team

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The following is a list of tasks designed to assess the status of available flow and related data and analyze these data relative to ecological flows (EF). Ecological flows are defined as the amount of stream flow necessary to maintain ecological integrity in aquatic river systems. Emphasis is on coastal plain waterways within the APNEP region where established methods of determining EF are limited. The overall goal is to recommend procedures and conditions for establishing EF within the APNEP region.

## PHASE I: Data Compilation

1. Identify sources of flow, surface and groundwater, data in coastal plains water ways in the APNEP region of North Carolina and Virginia. Gather, or centrally link to, available (real-time and historical) hydrologic data (discharge, water level), water quality data (specific conductivity, salinity, dissolved oxygen, temperature, and pH), geomorphological data (watershed area, slope, elevation, channel cross-sectional area), and climatic/meteorological data (precipitation, temperatures, wind, etc.). These data may come from established monitoring efforts, short-term research projects, or other sources.

2. Identify and gather sources of flow alterations (e.g., withdrawals from agricultural, urban, industrial sectors; dams, etc.; discharges from wastewater treatment plants, industrial operations, NPDES permits, etc. ).

3. Develop a data storage (or collection)/analysis platform (spreadsheet or database).

4. Make recommendations on (a) which basin(s) to conduct data analysis (Phase II) first, (b) how to fill data gaps, and (c) applications to address further needs.

## PHASE II: Data Analysis

5. For coastal plain waterways not included in prior Ecological Flow analyses, analyze flow records (flashiness, seasonal patterns, annual patterns, relationships with precipitation, flow-duration curves, tidal vs meteorological stage dependence, frequency and duration of overbank flow, annual baseflow vs stormflow discharge).

6. Assess the relationship between the river gauge data and stream data to determine the degree to which coastal plains streamflow might be predicted using the gauges.

7. Evaluate if pre-existing models might be used to accurately provide discharge, stage, and/or salinity estimates for ungauged streams based on the currently available data.

These tasks contribute to the understanding of the hydrodynamic component of EF. This component must be linked to ecological and geomorphological conditions to meet the goals of the action team. We recommend that ECU be contracted to begin Phase I during summer 2016. We envision that Phase II will be addressed beginning in winter 2017, with the caveat that specific Phase II tasks could be adjusted as a result of Phase I work.