**NASA DEVELOP National Program**

****Insert Team Location Here

**Summer 2015**

**Short Title: North Carolina Ecological Forecasting**

**Subtitle** Evaluating the Application of NASA Earth Observations to Detect Change in Wetland Types at a Regional Scale

**VPS Title:** Wetland Extent in the Albemarle Pamlico watershed

**Project Team & Partners**

**Project Team:**

Zand Bakhtiari, (Project Lead), zbakh001@gmail.com

Stephen Zimmerman

Kayla Patel

Brad Gregory (USAF)

**Advisors & Mentors:**

Dr. Kenton Ross

Michael Bender

Emily Adams

**Past or Other Contributors:**

**Partner Organizations**

Albemarle-Pamlico National Estuary partnership (APNEP), End User, Jim Hawhee

**Project Details**

**Applied Sciences National Applications Addressed:**

Ecological Forecasting

**Study Area:** Albemarle-Pamlico watershed in Virginia (VA) and North Carolina (NC).

**Study Period:** 1990 - 2015

**Earth Observations & Parameters**

Landsat 7 ETM+ – Land cover

Landsat 8 OLI – Land cover

Terra ASTER – Digital Elevation Model

**Ancillary Datasets Utilized**

* Digital Elevation Model(DEM) USGS EarthExplorer
* NOAA Coastal Change Analysis Program (C-CAP) - regional land cover
* Infrastructure – roads, buildings
* Soil Type
* State and County boundaries – shapefile
* Watershed boundary – shapefile

**Models Utilized**

* Random Forest Classification – Creators: Dr. Ned Norning and Dr. Martin Wegman
* Land Change Modeler – Idrisi TerrSet

**Software Utilized**

RStudio – RandomForest classification on Landsat imagery

Idrisi Terrset – future wetland extent prediction

ERDAS IMAGINE - land classification of Landsat imagery

ArcGIS - Raster Manipulation/Analysis, Image Enhancement & Map Creation of Landsat 7 and 8 imagery

**Project Overview**

**80-100 Word Objectives Overview**

Insert here (80-100 words max). Short and catchy synopsis of project and its objectives. 1-3 sentences. Keep the reader in mind, make it interesting!

**Abstract**

The purpose of this project is to determine Landover change in the Albemarle-Pamlico water shed from 1990 to 2015 using NASA Earth Observations (EO). EO used in this study will include Landsat 7 ETM+ and Landsat 8 OLI. In order to determine land cover change in the Albemarle-Pamlico watershed, images will be collected from 1990(Landsat 7) and 2015(Landsat 8). Images will be classified based on training sites and ancillary data (DEM, Roads, etc…) and then run through the Random Forest Classifier Model in the statistical programing language R. The outputs for this project will include quantitative (from-to) Landover change is the form of statistics, Maps showing the quantitative change, and a detailed tutorial to this study can be duplicated at a future point and time. The client for this study, Albemarle-Pamlico National Estuary partnership (APNEP), will be able to implement policy change in wetland conservation as a result of this study.

Insert here (150 - 250 words, preferably one paragraph)

* The abstract should be fully contained and give the reader a good grasp of the project.
* While there is a maximum word limit, if you can say it with fewer words, do so.
* State the most important information first.
* Avoid passive words like “might” or “could” – use powerful language.
* Use key words and phrases that will quickly give the reader an idea about the content and focus of the work (ex. Navajo Nation, drought, TRMM, PRISM).
* Don’t include citations.
* Don’t define terms.
* Read other projects’ abstracts for inspiration.
* Any major restrictions or limitations on results (if results are included) should be stated.
* Reread the abstract – did it answer who, what, where, when, and why? If it didn’t, then revise it!

**Community Concerns**

* Concern 1
* Concern 2
* Concern 3
* Etc.

**Current Management Practices & Policies**

**Decision Support Tools & Benefits**

|  |  |  |
| --- | --- | --- |
| **End-Product** | **Earth Observations Used** | **Benefit & Impact** |
| Maps showing Landover change from 1990 – 2015 | Landsat 8 | These maps can be used to demonstrate the change in wetland extent over the past 15 years.  |
| End-Product 2 |  |  |
| End-Product 3 |  |  |

**Project Imagery**

**Caption:** [Insert Caption Here. Max of 25 words.] Image Credit: [Insert project short title] Team.

**Image:** File Name (Please submit your image as a separate .jpeg as well as inserting it in this document)