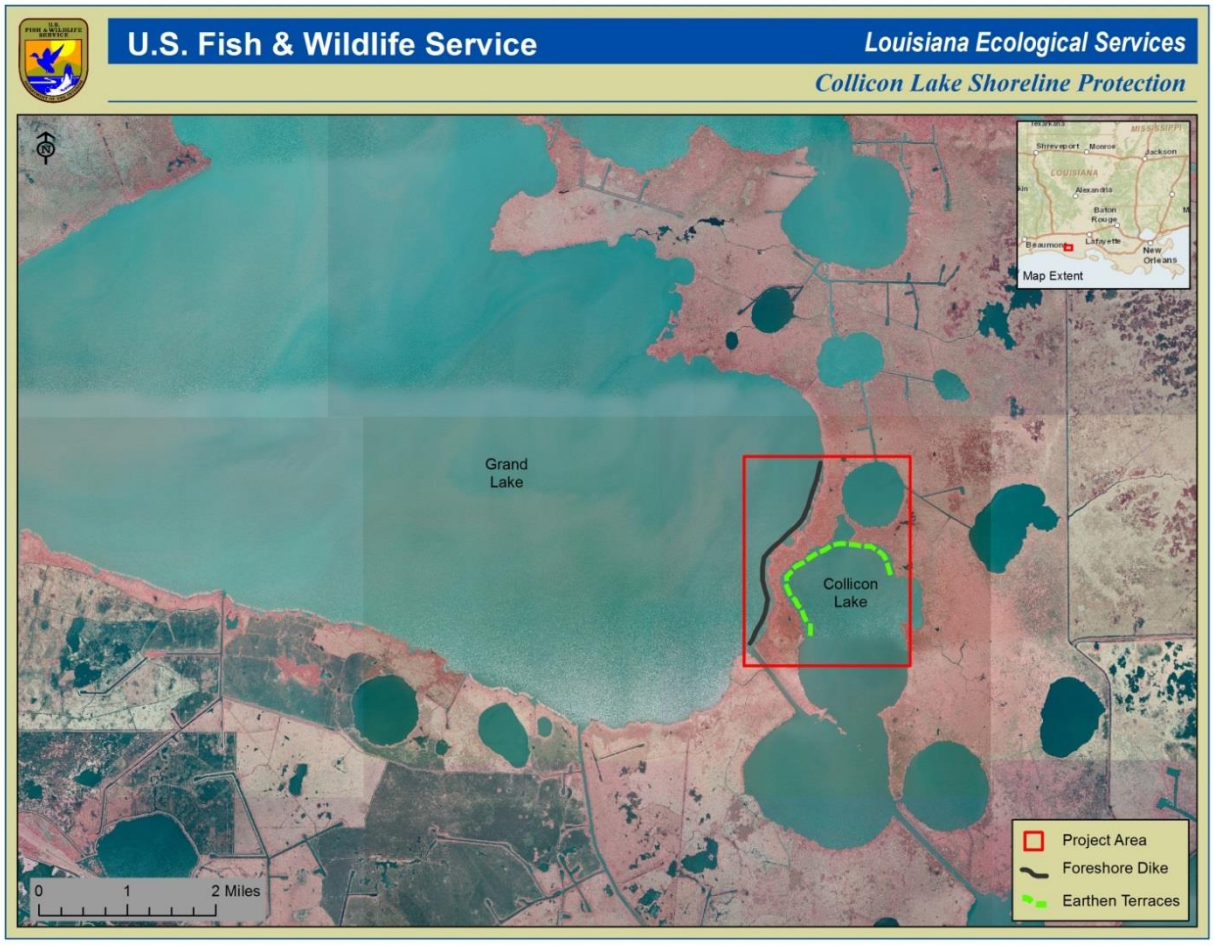
Louisiana's Coastal Wetlands Restoration Projects Monitored Using GIS

Robert Greco – Louisiana Ecological Services – Lafayette, LA

Louisiana has over 40% of the coastal wetlands in the lower 48 States, yet has suffered over 90% of the nation's coastal wetland loss. Louisiana Ecological Services is using GIS to identify areas of greatest wetland loss and to evaluate wetland restoration projects. One of those projects, Collicon Lake (http://lacoast.gov/reports/project/3890796~1.pdf) is part of the Grand-White Lake Land Bridge Protection project, funded through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA, http://lacoast.gov/new/About/Default.aspx)

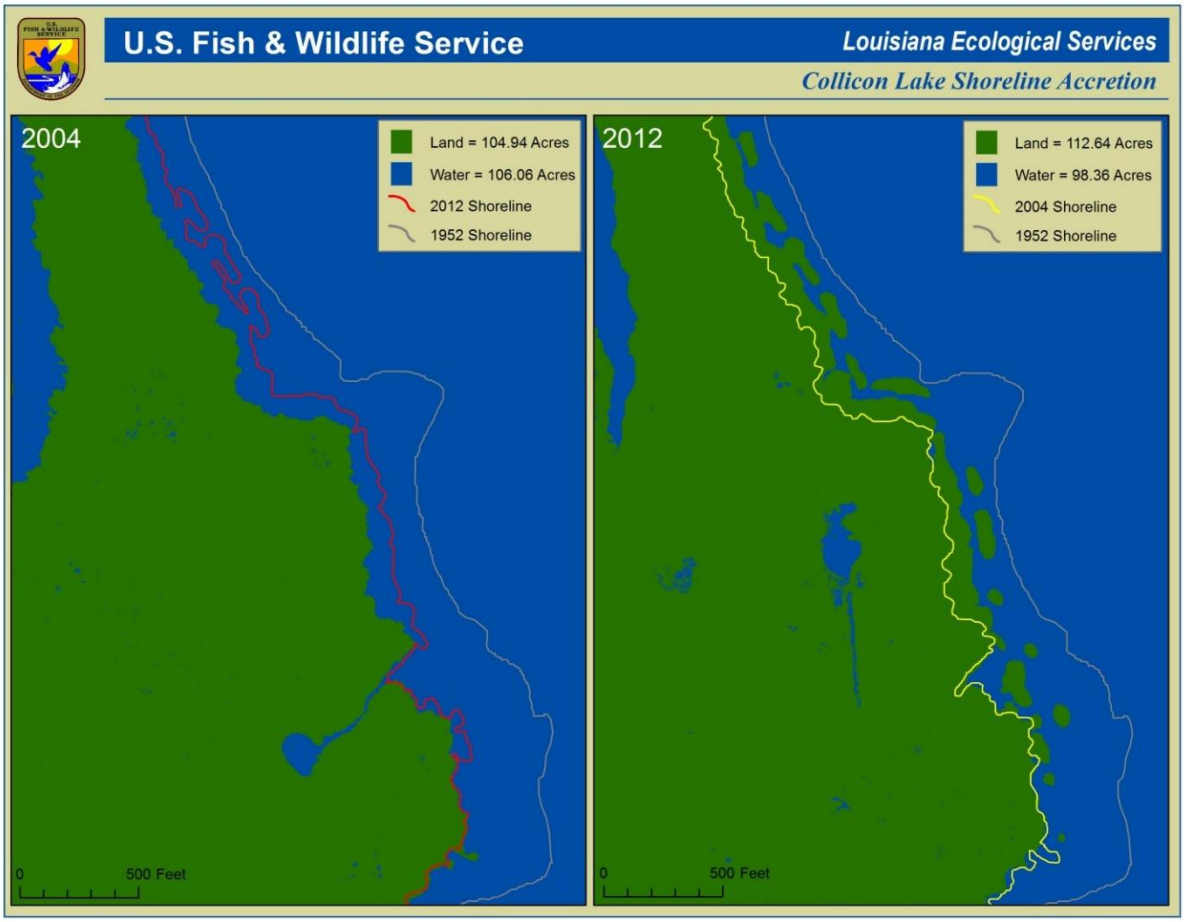
Over time, Collicon Lake's western shore, a land bridge, has experienced shoreline erosion due



to many factors, one being from wave energy. Without some type of restoration, Collicon Lake could lose its western shore and become part of Grand Lake, creating greater wave energy and erosion to surrounding wetlands. Two of the project features are 1) shoreline stabilization – limestone rock foreshore dike and 2) the land bridge's eastern shoreline - earthed terraces.

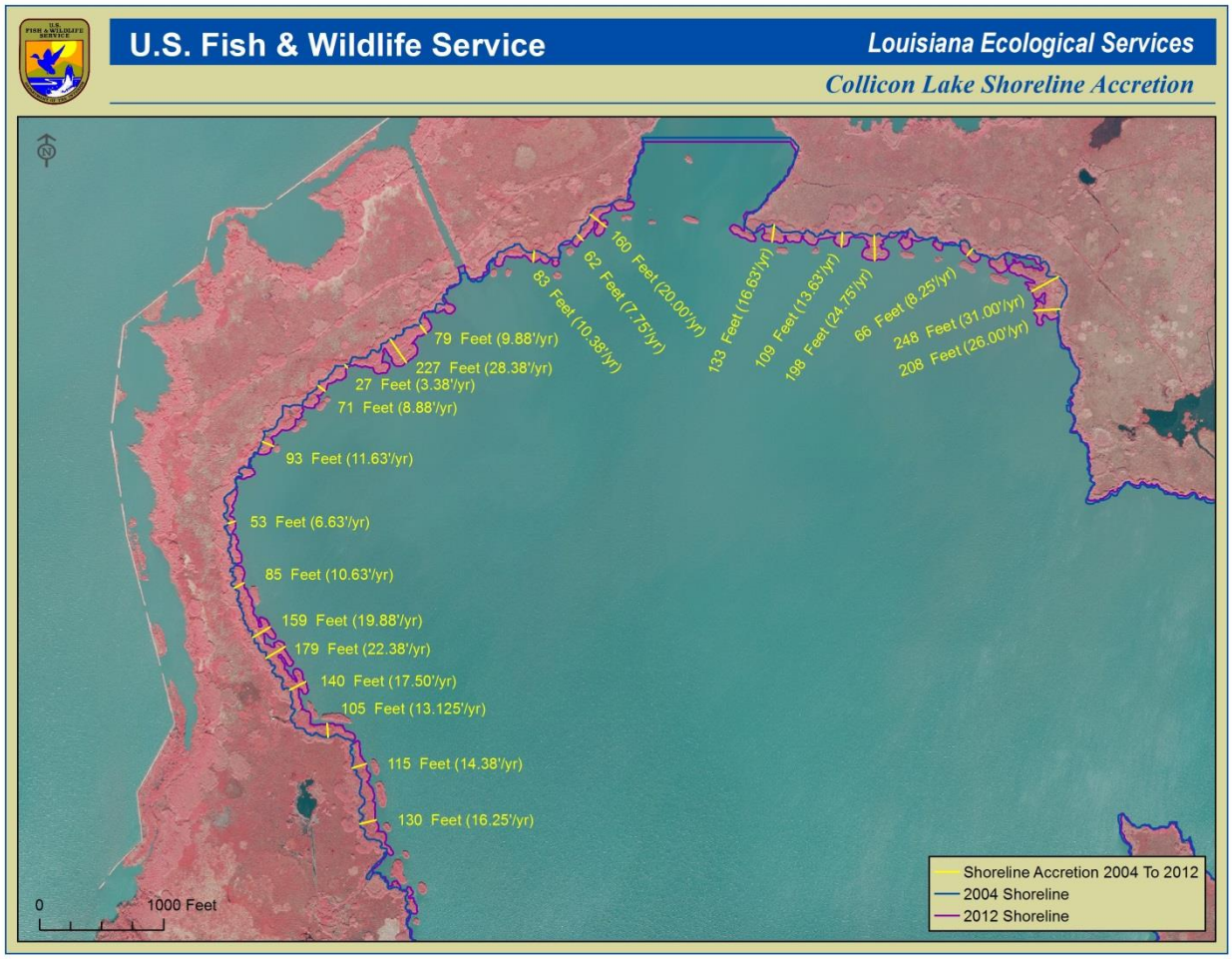
Project features were completed in 2004 and after eight years GIS was used to evaluate the successfulness of the earthen terraces.

ArcGIS 10.1 Image Classification – Iso Cluster Unsupervised Classification was used to classify pre and post construction aerial photography into land/water classes. Fifty classes were chosen to capture the variations in habitat signatures; high sediment waters have light blue signatures and low sediment waters give a black signature. Wetlands that have been burned (common during fall months in preparation for waterfowl hunting season to generate new vegetation, same time skies are clear and good to collect aerial photography) give a black signature. By choosing many classes in the image classification tool, the goal is to spread out the different shades of blacks and other similar habitat signature colors to be able to distinguish land vs water categories. Similar habitats are grouped and acreages are computed to determine the successfulness of the project's earthed terraces.



This project has a twenty year monitoring plan/budget and project managers were trying to determine if the western shoreline of the land bridge would need a limestone foreshore dike due to some of the terraces erosion rates. There were two rows of earthen terraces built, the lake side terraces were sacrificial – would expect to experience high erosion rates, and the

landward side terraces which would become established and permanent, providing shoreline protection and the mechanism for sediment trapping and natural vegetation growth resulting in shoreline stabilization. Aerial photography from the year of project construction and current photography were used to delineate shoreline locations and shoreline accretion rates.



This GIS analysis provided the scientific results to assist project planners, managers and engineers in determining that an artificial and costly limestone foreshore dike was not needed at this time.