**NASA DEVELOP National Program**

****NASA John C. Stennis Space Center

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**Mississippi Ecological Forecasting**

**Updated Abstract**

The dusky gopher frog (DGF), *Lithobates sevosus*, is currently found in only four ponds in south Mississippi. This small, wild population is threatened by high risk of inbreeding depression due to genetic isolation, loss of habitat due to land development, wildfire suppression, and runoff from surrounding roadways and urban areas. Historically, these frogs inhabited longleaf pine ecosystems and utilized burrows from the gopher tortoise (*Gopherus polyphemus),* which is also endangered. In response, this project used data from NASA Earth observations to locate potential habitat for the DGF. Landsat 8 OLI was used to calculate vegetation indices and produce updated land cover classifications. ASTER imagery and Landsat 5 data were used to calculate vegetation indices and water quality indices for the study area. These products then utilized to identify ponds, to assess their canopy cover and hydrology over the course of the year, to locate emergent and submerged vegetation, and to derive proximity to roadways, developed land, and other bodies of water. NAIP aerial data were assessed for their ability to detect ponds smaller than those detectable at the Landsat scale. This project will augment current decision-making practices regarding where relocation and reintroduction ponds for the dusky gopher frog should be established in order to aid in monitoring, protection, and restoration of this critically endangered species. Using this information, partnering organizations will be able to identify and map areas with the ideal land cover, water quality, and elevation characteristics for DGF habitation.