**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 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 also used to calculate vegetation indices and water quality indices for the study area. NASA Earth Observations were utilized to identify ponds, assess canopy cover, proximity to roadways, proximity to developed land, proximity to other bodies of water, appropriate pond hydrology over the course of the year, and emergent and submerged vegetation. NAIP aerial data were assessed for 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.