Team Members

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(Project Lead)

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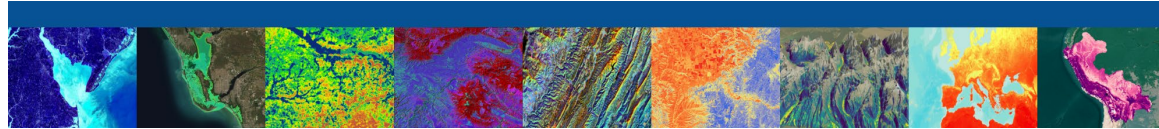**Kevin Jo**

Partners

U.S. Fish and Wildlife Service

Idaho Department of Fish and Game

Operating under NASA Earth Action, DEVELOP conducts feasibility studies that bridge the gap between Earth science information and society. DEVELOP works with communities and organizations to address environmental and policy concerns through 10-week projects that help both participants and partners learn about using NASA Earth observations.

Be a Part of the DEVELOP National Program

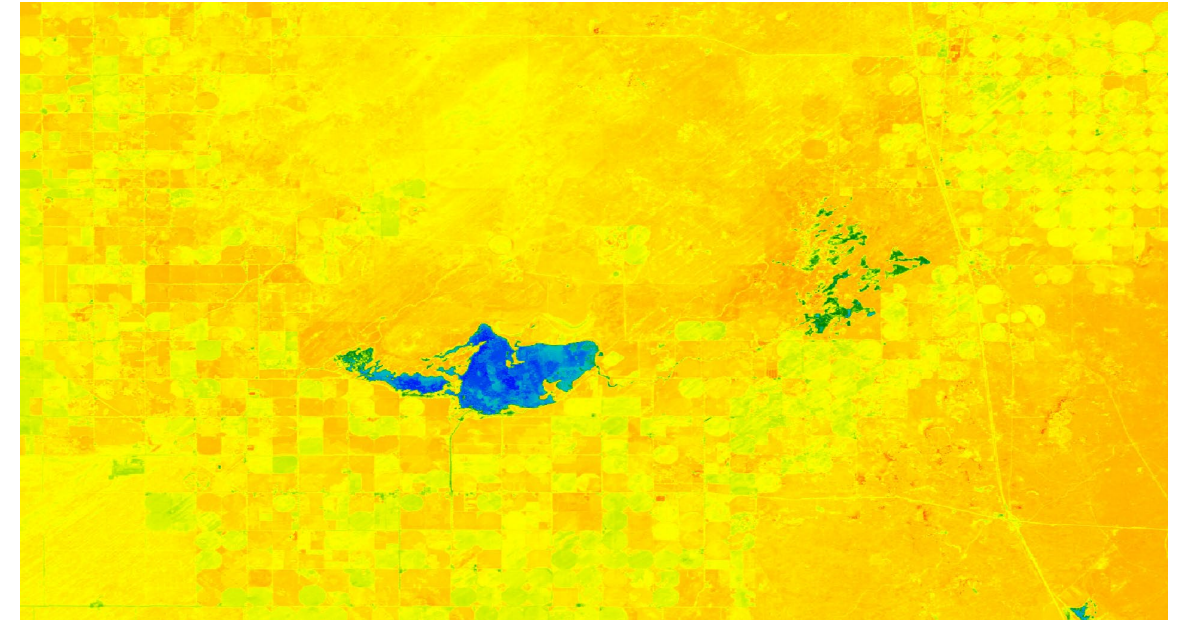For more information on becoming a participant or project partner, visit us online at **https://appliedsciences.nasa.gov/nasadevelop**

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National Aeronautics and Space Administration

Quantifying the Effects of Hydrologic Restoration in the Camas National Wildlife Refuge and Mud Lake Wildlife Management Area
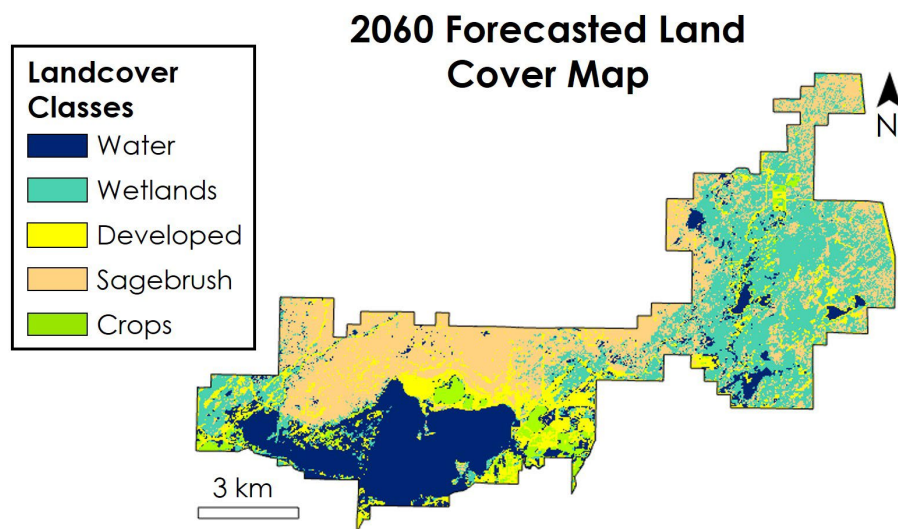
**Jefferson County Ecological Conservation**

Project Purpose

The wetlands in Camas National Wildlife Refuge (Camas) and Mud Lake Wildlife Management Area (Mud Lake) provide crucial habitat for waterfowl migrating along the Pacific Flyway. Decreasing snowpack, urban water use, and changing irrigation practices (from flood irrigation to pivot irrigation by nearby farms along the Egin Bench), have caused a noticeable decrease in the wetlands' water levels over the past 40+ years. The U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game, who manage these areas respectively, have ongoing wetland restoration projects that have yet to be quantified due to the time and cost of collecting field data. Our study created a wetland monitoring method using remote sensing technology to quantify restoration efforts. This provides accessible analysis tools for large spatial and temporal studies.

Our study also compared remotely sensed light detection and ranging (lidar) data from 2011 and 2019 to detect and analyze changes in vegetation height.

Vegetation Height Change

2060 Forecasted Land Cover Map

Landcover Classes
- Water
- Wetlands
- Developed
- Sagebrush
- Crops

Our study utilized NASA Earth observations to calculate the area of the wetlands in 2016 and 2020. We also predicted the future extent of landcover and wetlands in 2060, using precipitation and temperature as predictor variables.
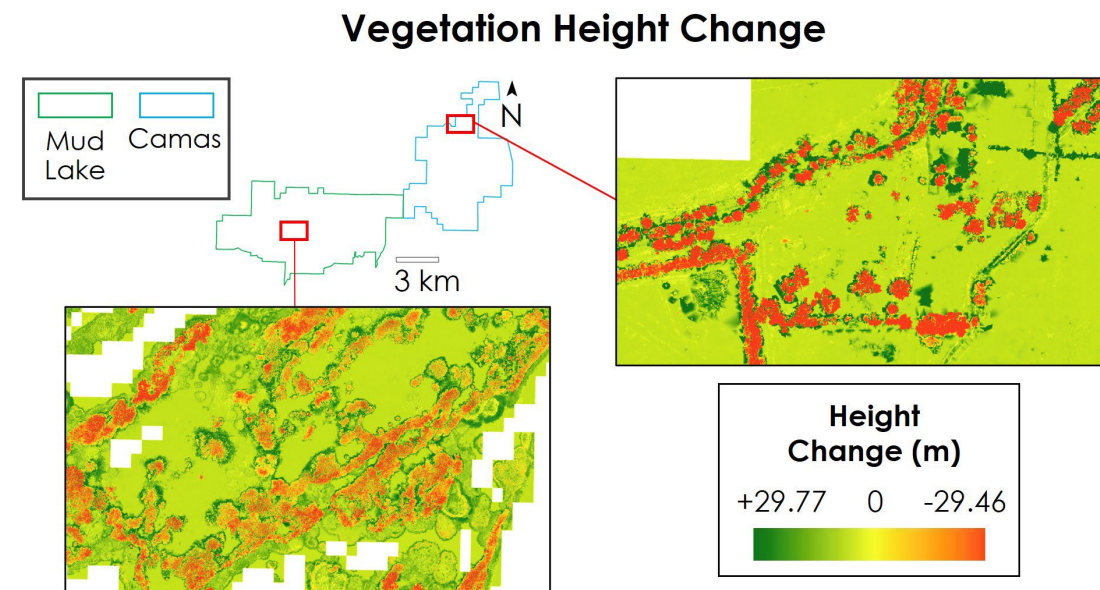
- There was effectively no change in vegetation height across the entire study area, with a mean increase of +1.60 cm. Upon closer visual inspection, the willows around the edge of Mud Lake showed some growth and some decline. Riparian areas across the study area, and the planted Shelter Belt in Camas show a decrease. This is most likely because the 2019 lidar was collected after the trees lost their leaves for the winter in November.
- According to our model, between 2020 and 2060 wetlands will decrease by 38.96%, or 2796 acres, as Idaho is predicted to get drier and hotter.

To learn more about projects like this, visit **https://appliedsciences.nasa.gov/what-we-do/capacity-building/develop/projects**