# Jefferson County Ecological Conservation

## Quantifying the Effects of Hydrologic Restoration in the Camas National Wildlife Refuge and Mud Lake Wildlife Management Area

## Project Synopsis

Wetlands in the Mud Lake Wildlife Management Area and Camas National Wildlife Refuge have experienced declines in surface water throughout the past 40+ years. To increase the surface water encompassed by the wetlands, the U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game have ongoing restoration projects. In our study, we utilized NASA Earth observations to quantify wetland restoration efforts by determining wetland extent and change in 2016 and 2020, predicting wetland extent in 2060, and creating repeatable methods to guide future monitoring and decision making.

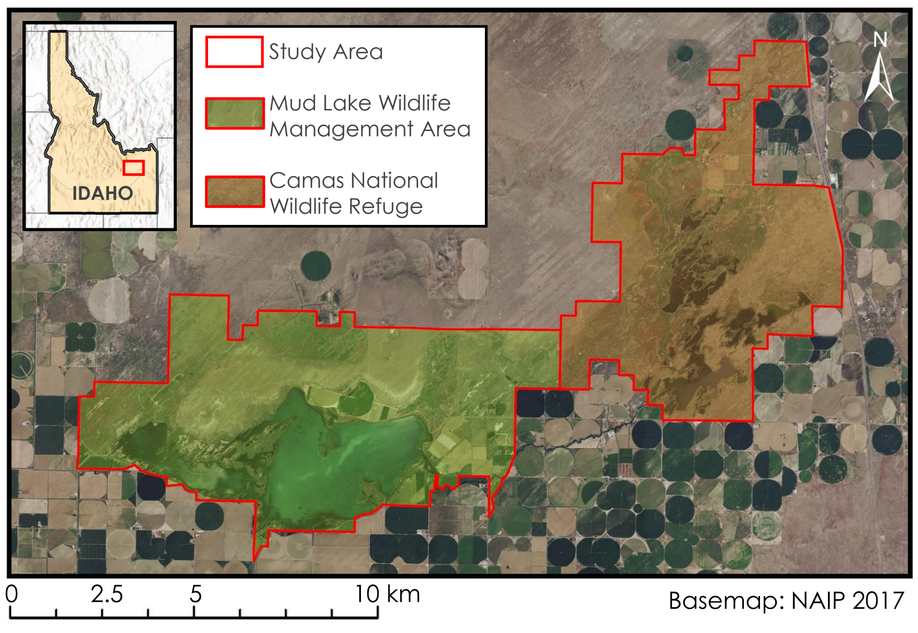
## Project Partners

- U.S. Fish and Wildlife Service, Camas National Wildlife Refuge
- Idaho Department of Fish and Game, Mud Lake Wildlife Management Area

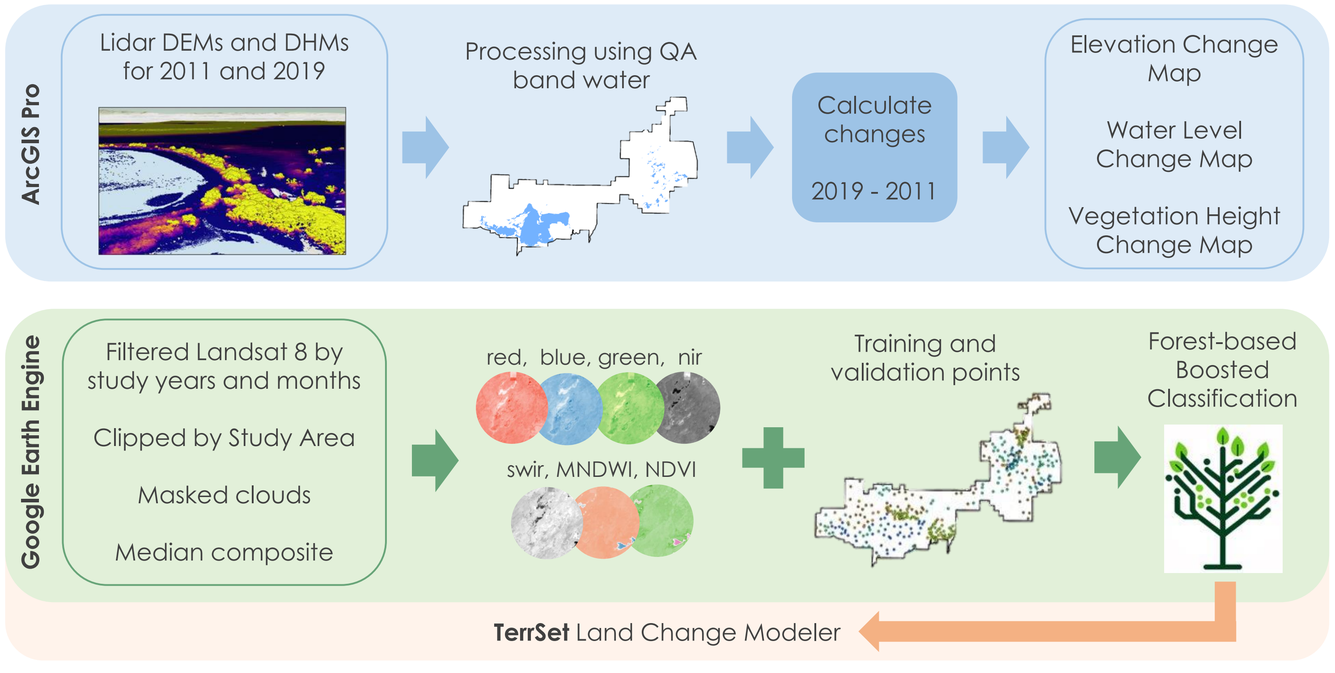
## Objectives

- **Analyze** changes in the elevation, surface water level and vegetation with lidar data
- **Classify** 2016 and 2020 landcover to determine wetland extent
- **Forecast** wetland extent to 2060
- **Develop** repeatable methods for future monitoring and restoration evaluation

## Study Area

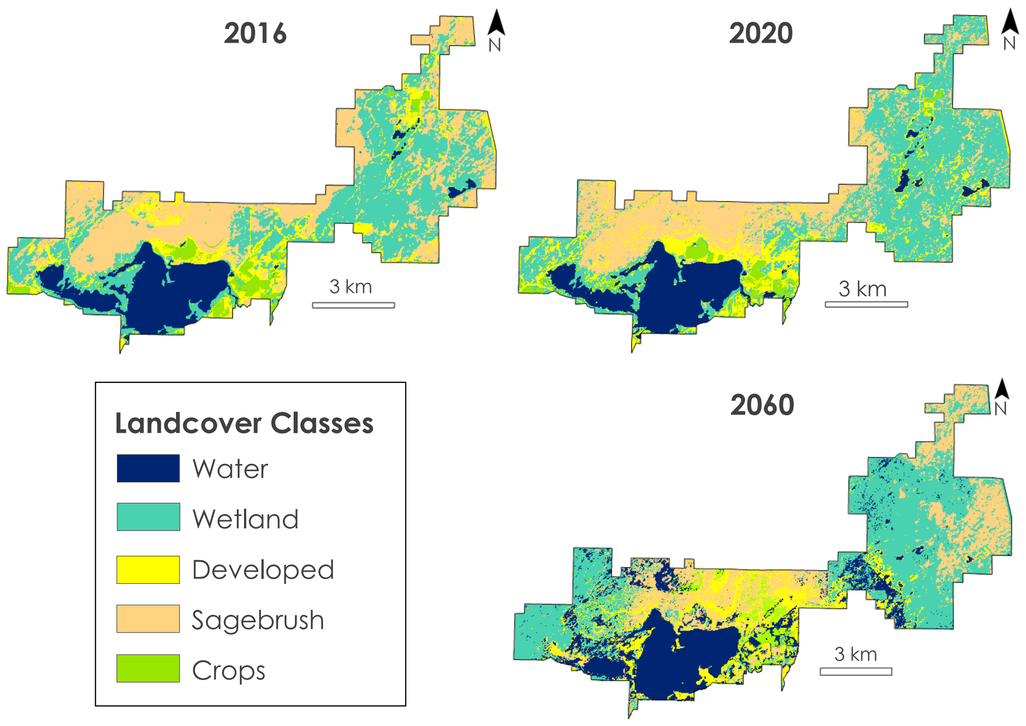



## Methodology

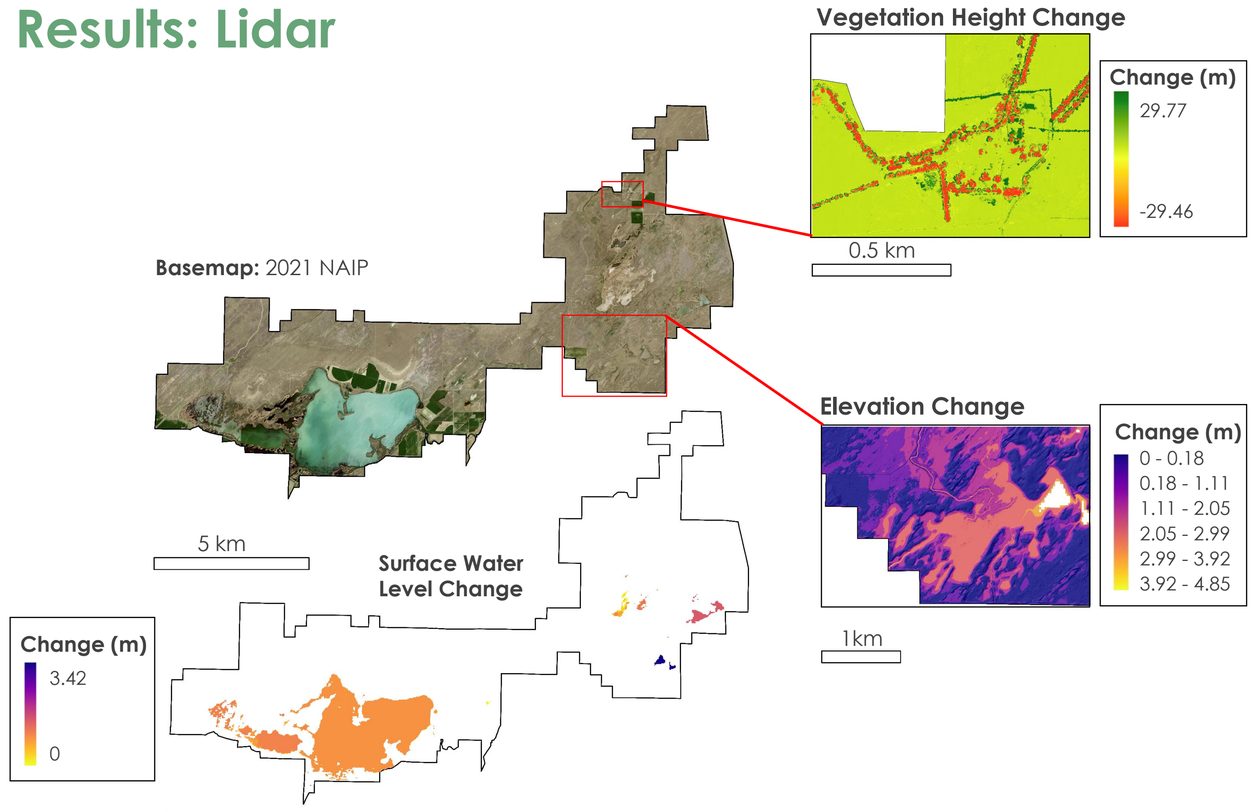



## Earth Observations


## Results: Classification




## Results: Lidar




## Conclusions

- Lidar successfully detected elevation, surface water level, and vegetation height changes.
- A Forest-based Boosted Classification using remotely collected training data can identify wetlands with **greater than 84% validation accuracy.**
- Wetland extent **increased by 8.28% between 2016 and 2020 in the study area.**
- Wetlands are predicted to **decreased by 0.35% by 2060.**
- **The team created a repeatable monitoring workflow** and **tutorial** for partners.

## Team Members


Cassidy Bromka
Project Lead

Rosemary D'Andrea

Matthew Stewart

Kevin Jo


## Acknowledgements


**DEVELOP Science Advisor:** Keith Weber
**DEVELOP Fellows:** Jane Zugarek, Michael Pazmino
**Project Partners:** (U.S Fish & Wildlife Service) Andrea Kristof, Brian Wehausen, Jeremy Timpey, Michelle Chappell; (Idaho Department of Fish & Game) Brett Panting, Ailvie Freestorm
**Other:** Ryan Healey

This material contains modified Copernicus Sentinel data (2016 - 2023), processed by ESA.





*This material is based upon work supported by NASA through contract 80LARC23FA024. Any mention of a commercial product, service, or activity in this material does not constitute NASA endorsement. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Aeronautics and Space Administration and partner organizations.*