An aerial satellite image of a wetland or coastal area, showing a complex network of water channels and land parcels. A grid is overlaid on the image, likely representing a spatial analysis or prediction model. The colors are muted, with various shades of blue, grey, and brown.

The Advanced Landcover Prediction and Habitat Assessment (ALPHA) Program

Evan R. DeLancey, Jahan Kariyeva, Alex Onojeghuo, Liam Beaudette



ALPHA what is it?



- Using Earth observation and spatial data science to answer questions about Alberta's landscape
 1. Where are all the wetlands in Alberta?



ALPHA what is it?



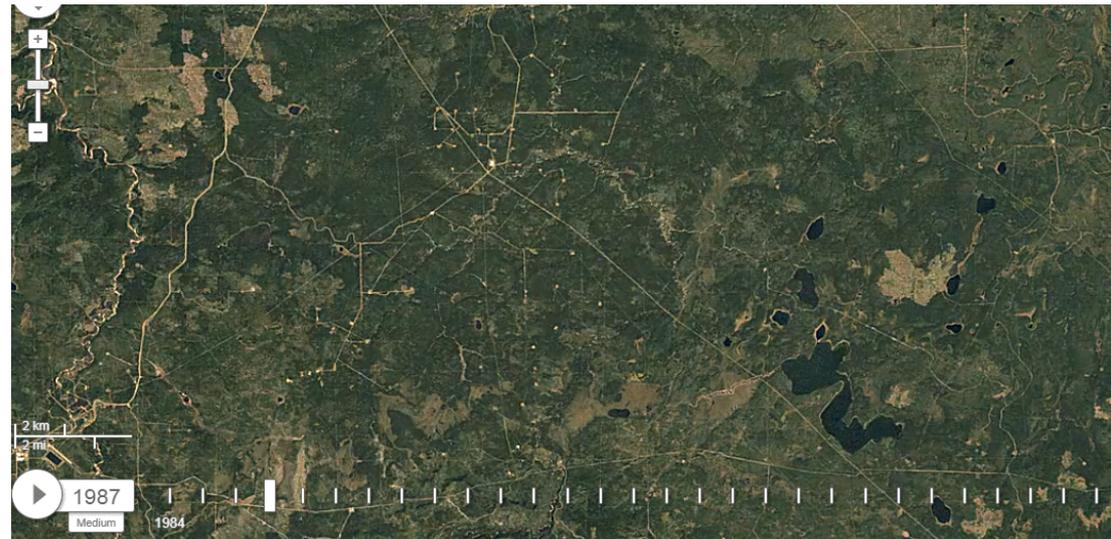
- Using Earth observation and spatial data science to answer questions about Alberta's landscape
 1. Where are all the wetlands in Alberta?
 2. How often does this prairie pothole flood?



ALPHA what is it?



- Using Earth observation and spatial data science to answer questions about Alberta's landscape
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 2. How often does this prairie pothole flood?
 3. What year was this harvest area cut?



ALPHA what is it?



- Using Earth observation and spatial data science to answer questions about Alberta's landscape
 1. Where are all the wetlands in Alberta?
 2. How often does this prairie pothole flood?
 3. What year was this harvest area cut?
 4. Where are under ground weapons facilities?



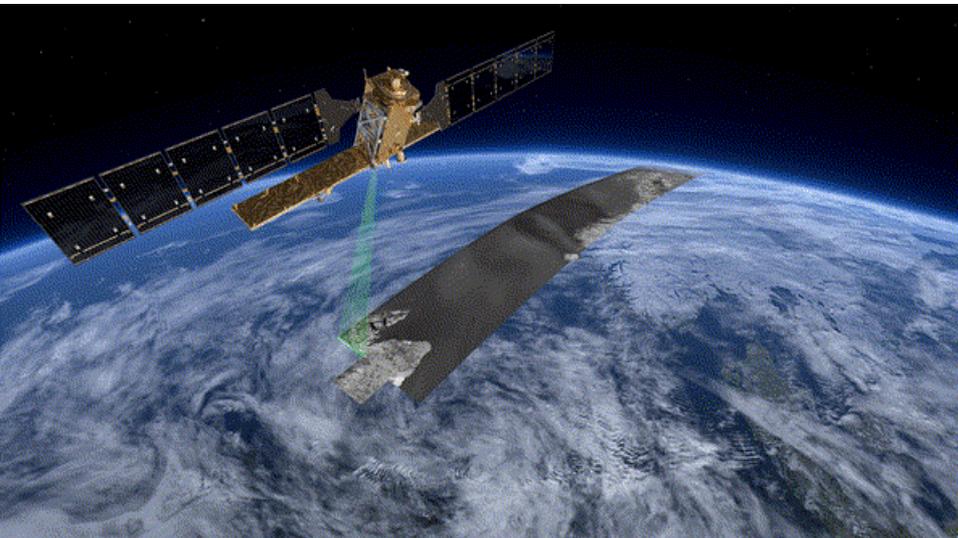
It's Our Nature *to Know*

Alberta Biodiversity Monitoring Institute

Why Earth observation data?



1. Consistent repeated data collection
 - Want to survey your study site daily?
2. Easy access to provincial – global scale data
3. #1 and 2 together!
 - Full coverage of Alberta every few days



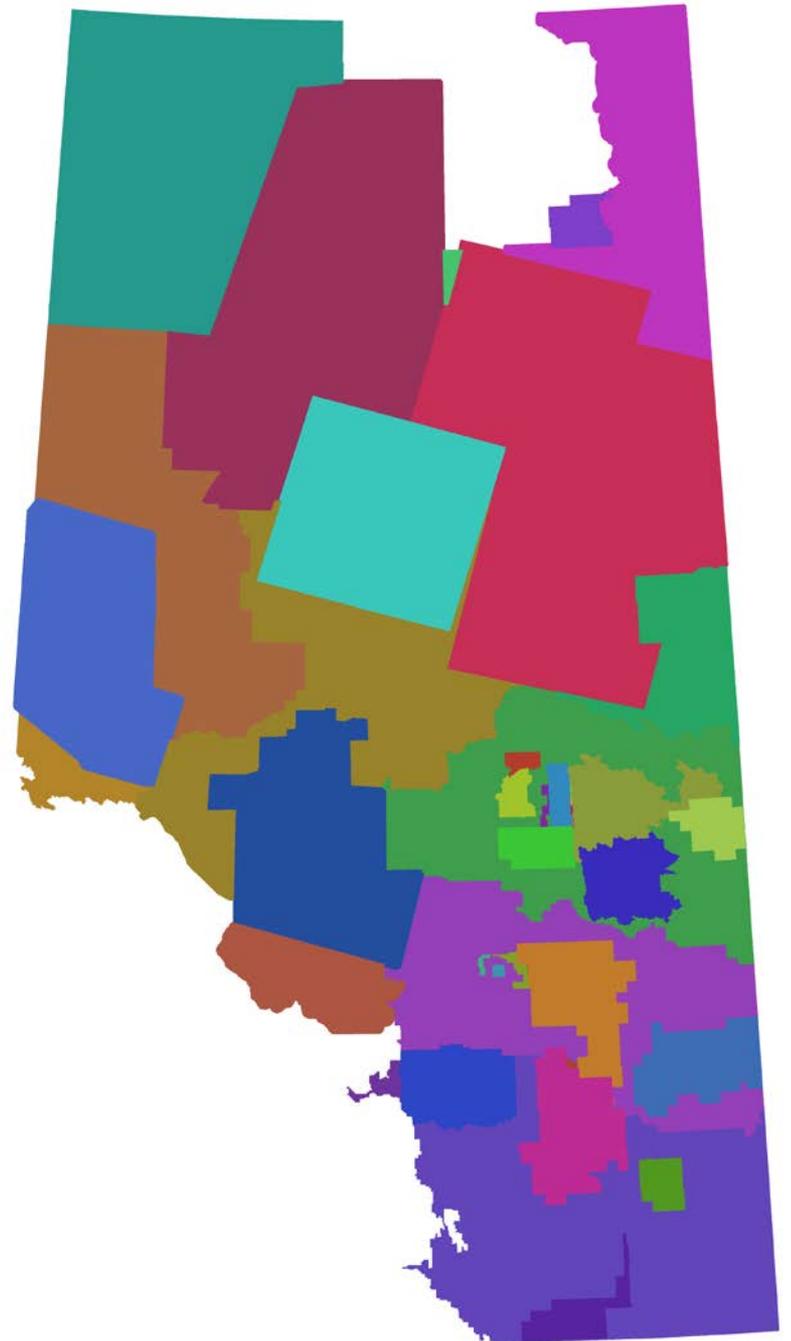
Why did we start this program?



- Need for:
 1. Spatially consistent inventories
 2. Large scale (provincial)
 3. Open access
 4. Consistently updated

Why did we start this program?

- Alberta landcover inventories
 - Alberta Vegetation Inventory – AVI
 - Grassland Vegetation Inventory – GVI
 - Alberta Merged Wetland Inventory – AMWI
 - Derived Ecosite Phase – DEP
 - Base feature HydroPolys



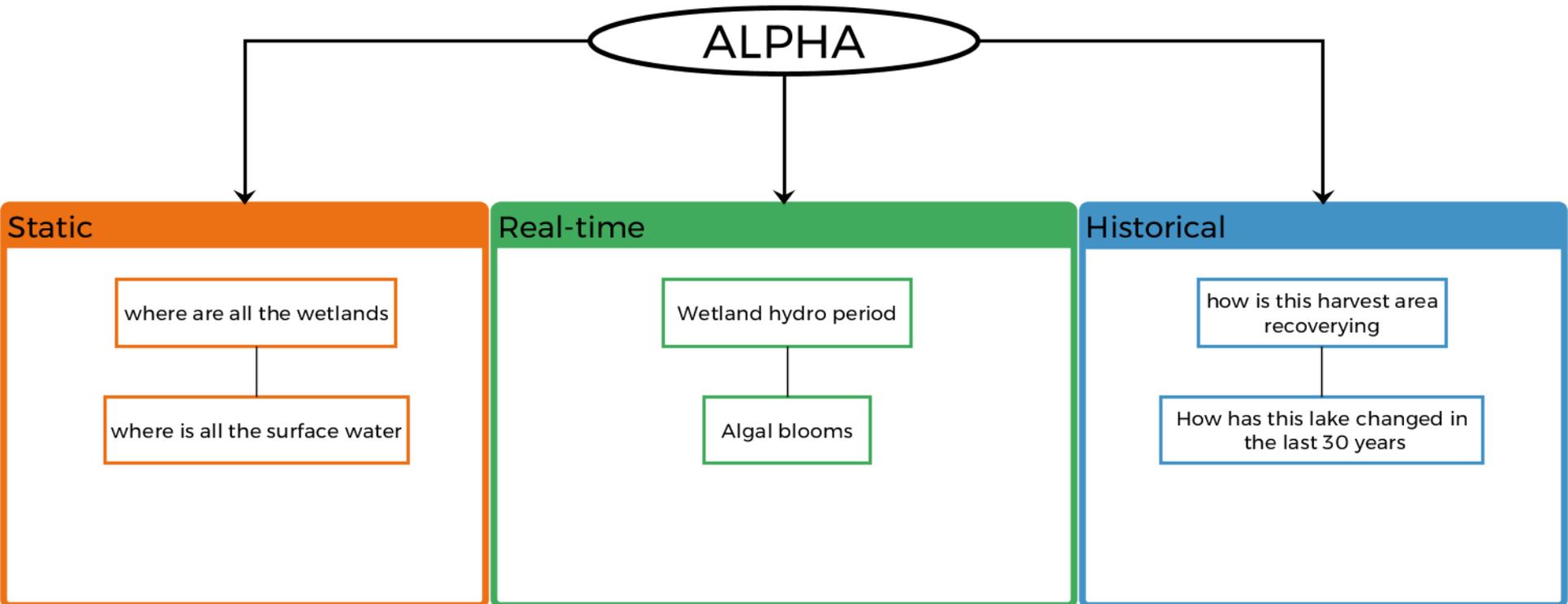
Why did we start this program?



- The need to capture dynamic aspects of the environment
 - Historical change
 - Real-time change

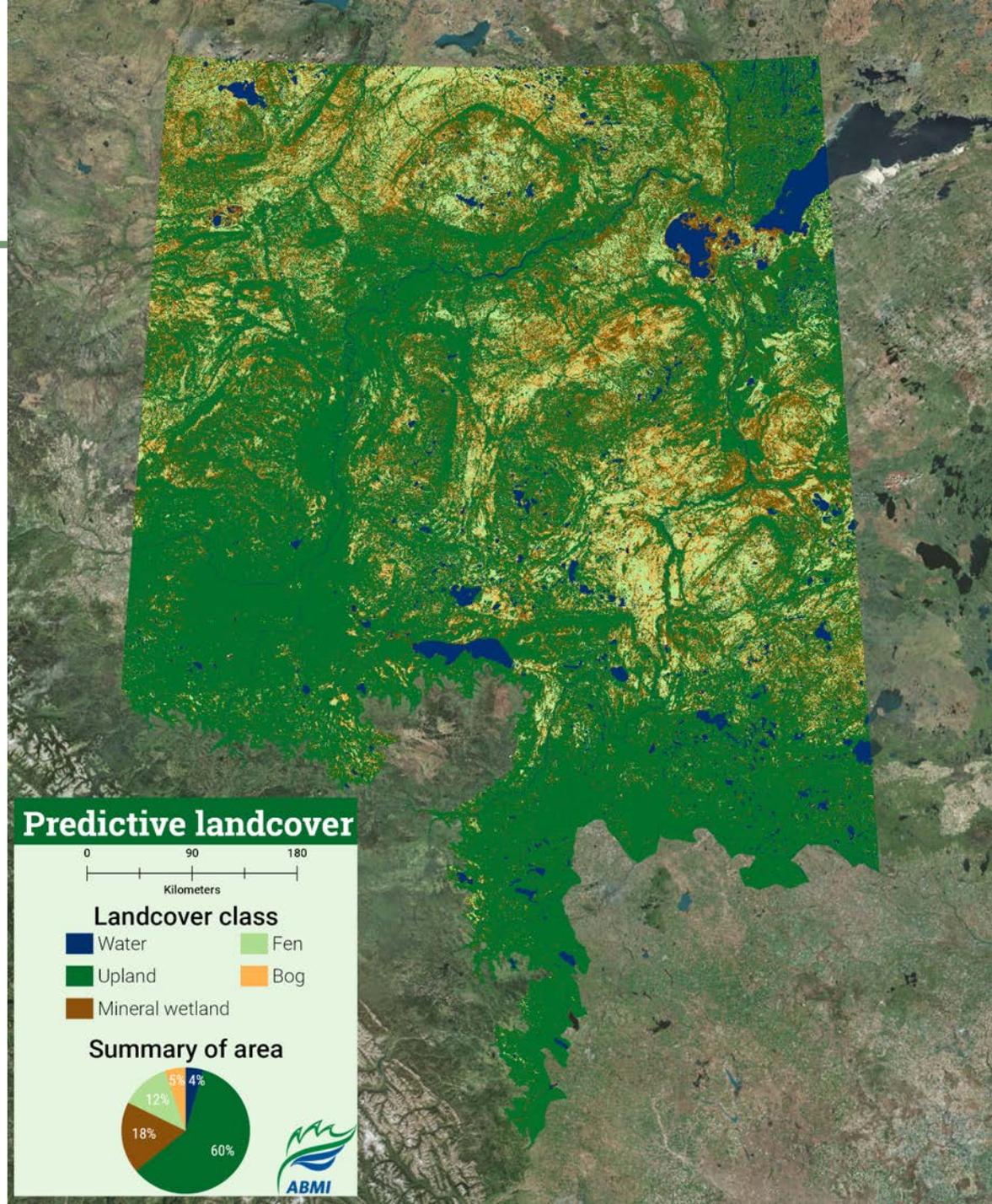


What questions have we tried to answer?



Products!

1. Predictive landcover
 - 4 wetland classes

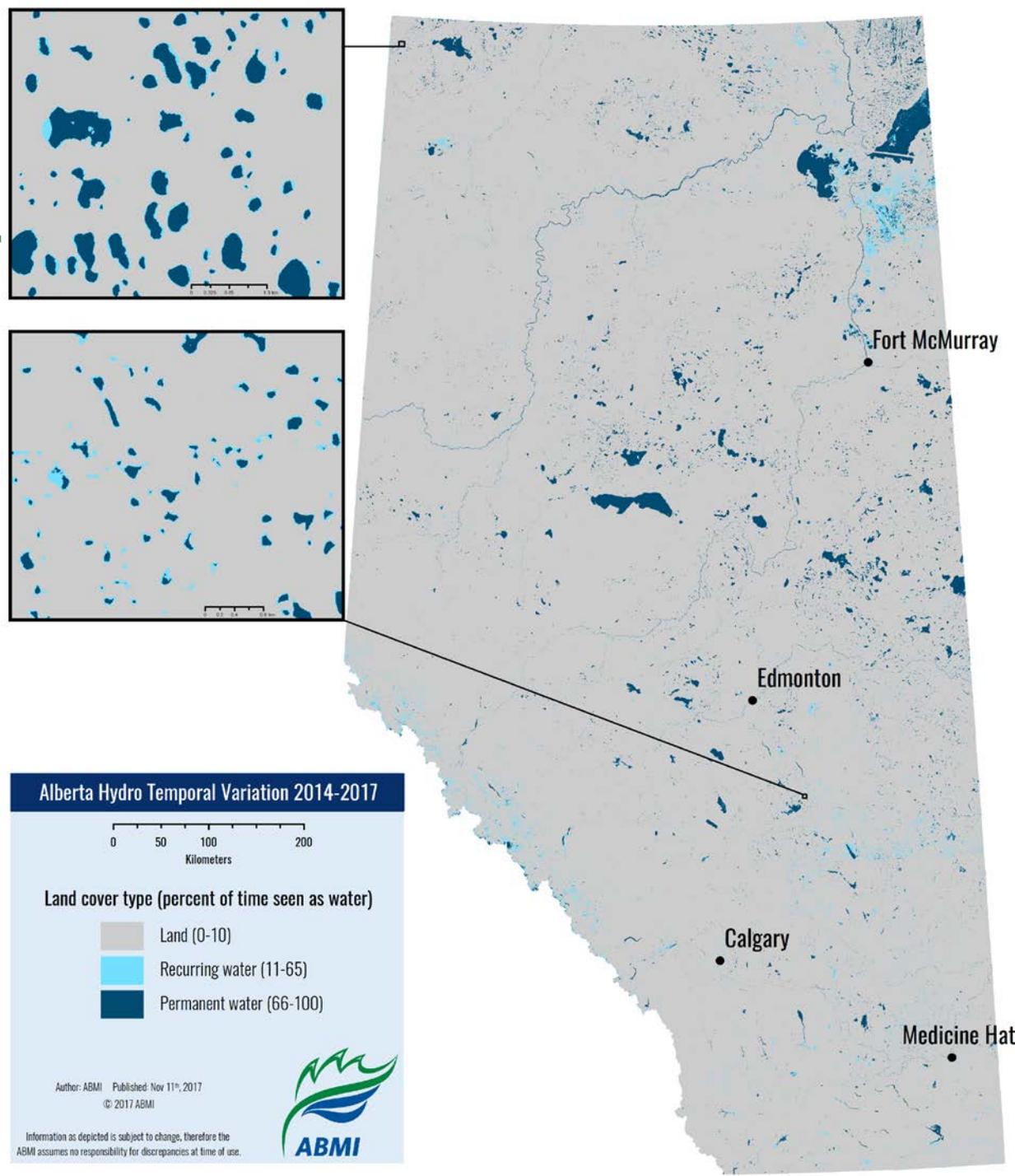


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Products!

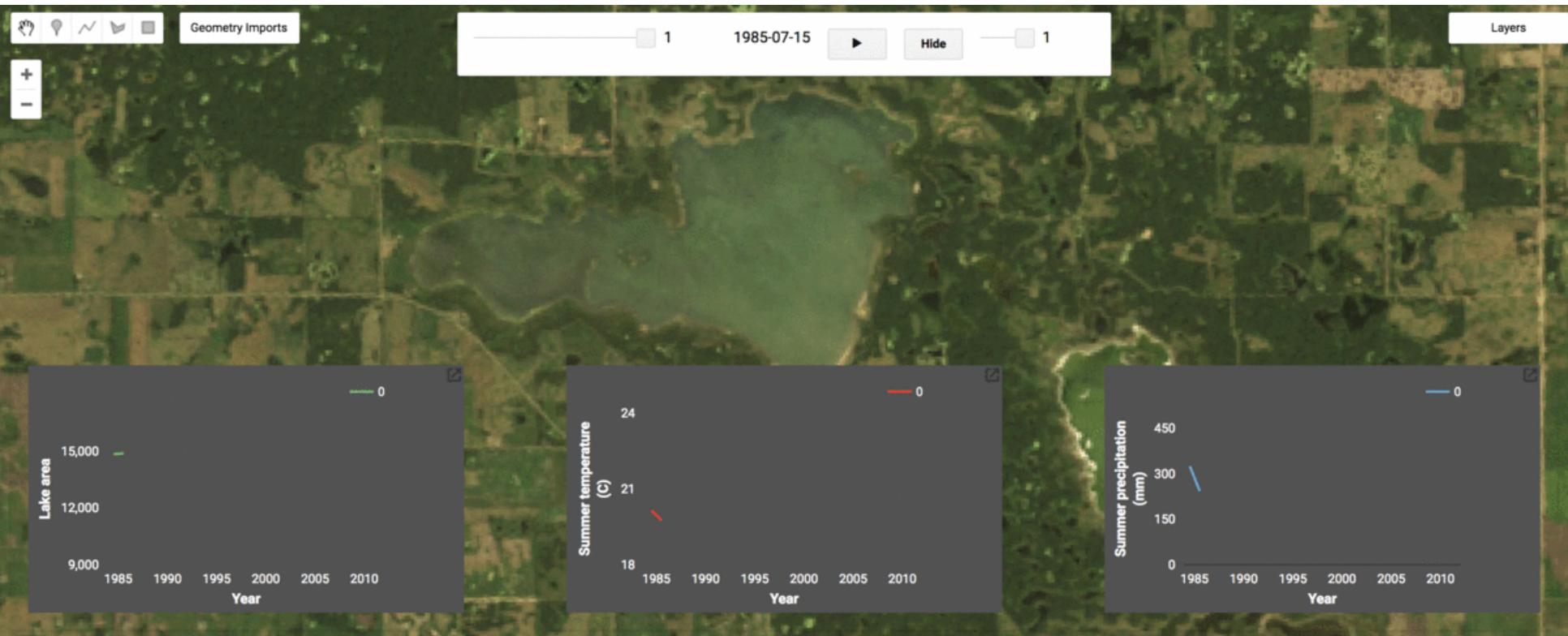
1. Predictive landcover
 - 4 wetland classes
2. Hydro period



Products!



3. Historical surface water web application



It's Our Nature *to Know*

Alberta Biodiversity Monitoring Institute

What questions need answering?



- Questions that can be solved through Earth observation data
 - Provincial to country scale questions
 - Questions that require weekly observations
 - Data for remote areas

How can we improve?



- Most of our data products and multiple publications are freely available on the ABMI website – www.abmi.ca

Predictive Landcover
Enabled through machine learning, Predictive Landcover is a geospatial sensor system built using a fusion of optical, Radar, LiDAR DEM, and other DEMs.

Boreal Fen Probability
The Boreal Fen probability data set is a raster-based product that describes the probability of fen habitat at a 10 m resolution across the entire Alberta Boreal Forest Natural Region.

Boreal Peatland Probability
The Boreal Peatland probability data set is a raster based product which describes the probability of peatland habitat at a 10 m resolution across Alberta's Boreal Forest Natural Region.

Boreal Surface Water Inventory
The Boreal Surface Water Inventory is a data set which gives the location, extent, and attributes of 421,348 waterbodies across the Alberta Boreal Forest Natural Region.

Data Download

Overview

Species & Habitat Raw Data

GIS Data: Land Surface

- Wall-to-Wall Human Footprint Inventory
- Wall-to-wall Land Cover Inventory
- 3 x 7-km Photoplot Land Cover Data
- 3 x 7-km Sample-based Human Footprint Data
- Predictive Landcover
- Boreal Fen Probability
- Boreal Peatland Probability
- Boreal Surface Water Inventory
- Boreal Wetland Probability Data
- Detailed Vegetation Maps
- Hydro Temporal Variability
- Native Vegetation Edge
- Native Vegetation Mesh Size
- Vegetation Greenness

GIS Data: Biogeoclimatic Layers

Satellite & Aerial Data

GIS Data: Biodiversity

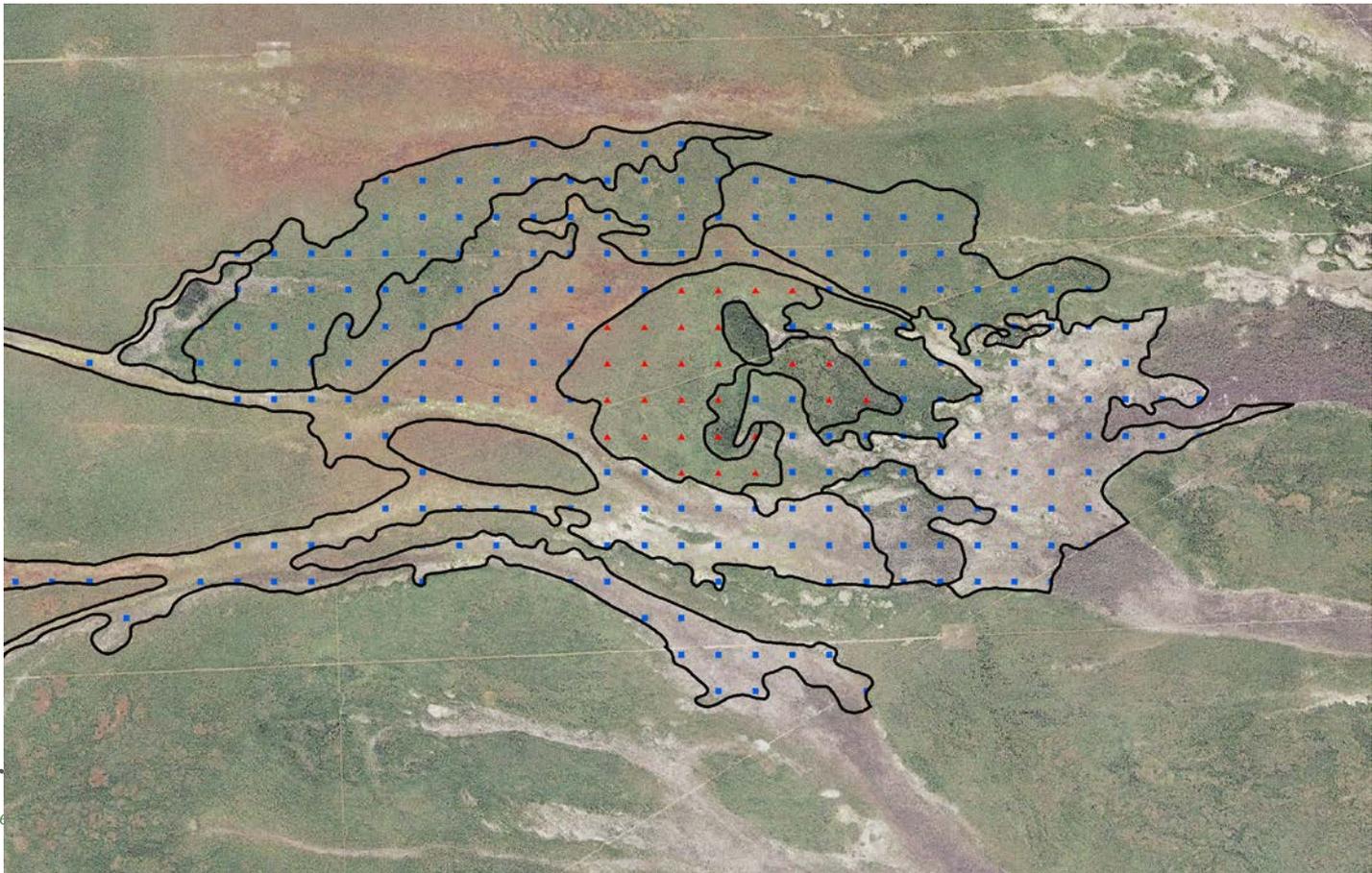
Species-level Data Sets

Other Data Sets

How can we improve?



- New data
 - Example: how do you distinguish bog from fen?



How can we improve?

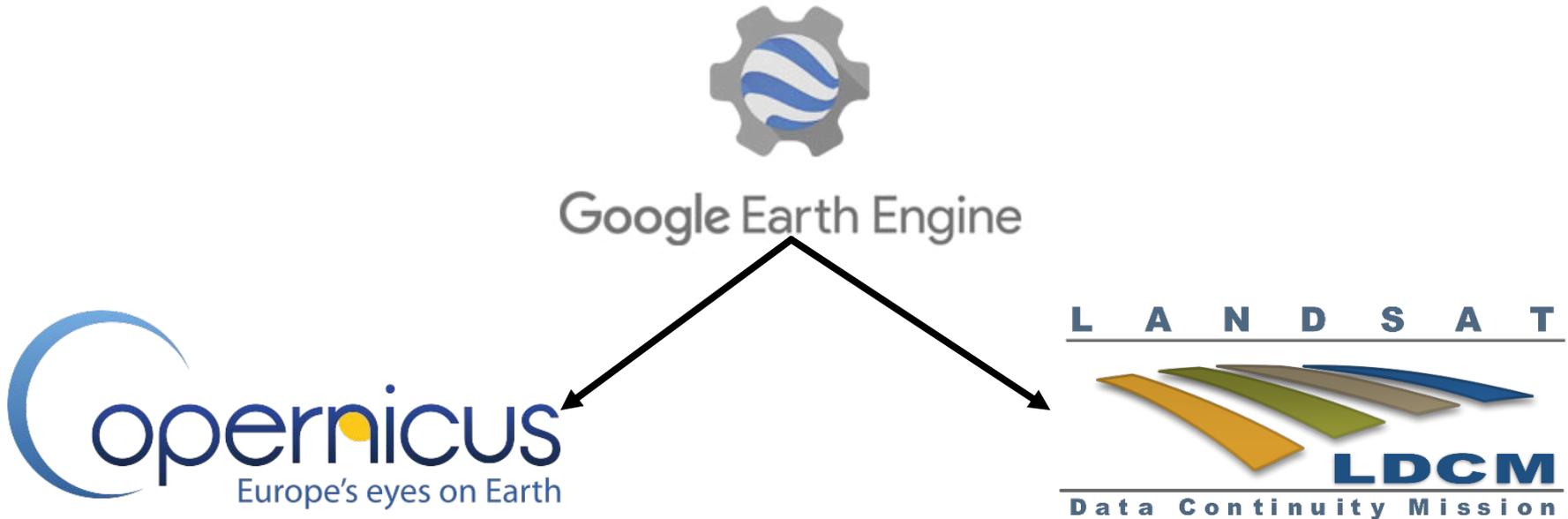


- More user friendly data products

Take home message



- New technologies allow for easy large scale mapping
 - Real time and historical mapping and monitoring



Take home message



- ALPHA program

Current state/static maps + historical EO +
real-time EO

=

Holistic view/data of Alberta's landscape

Feedback



1. What question do you need answered?
2. How can we collaborate to produce better products?
3. How can we improve our products?

Landcover is dynamic!

Google

TOLIARA ST AUGUSTIN MADAGASCAR
1984



Thanks to the team – Jahan, Alex, Liam

Questions?

Feedback?

