



Transforming the invisible into the invaluable

JACIE 2022

Charles Mondello

cmondello@hyspeciq.com

(571) 786-1745



Welcome to the next frontier in remote sensing technology

In the early 2000s the ASPRS 10 Year Forecast showed HSI as a needed technology for the future

The data sets were large, they needed ancillary content and were challenging to understand

But Hyperspectral imaging was known to complete the picture, detecting what things are made of and how they change over time

HySpecIQ is designing its system to capture hyperspectral imagery to answer that need by optimizing for a balance of GSD and SNR

We are an analytics firm that happens to have satellites



HySpecIQ HSI technology

Initial 2 vehicles' payload optics are designed to maximize signal and resolve targets not traditionally seen with space based HSI

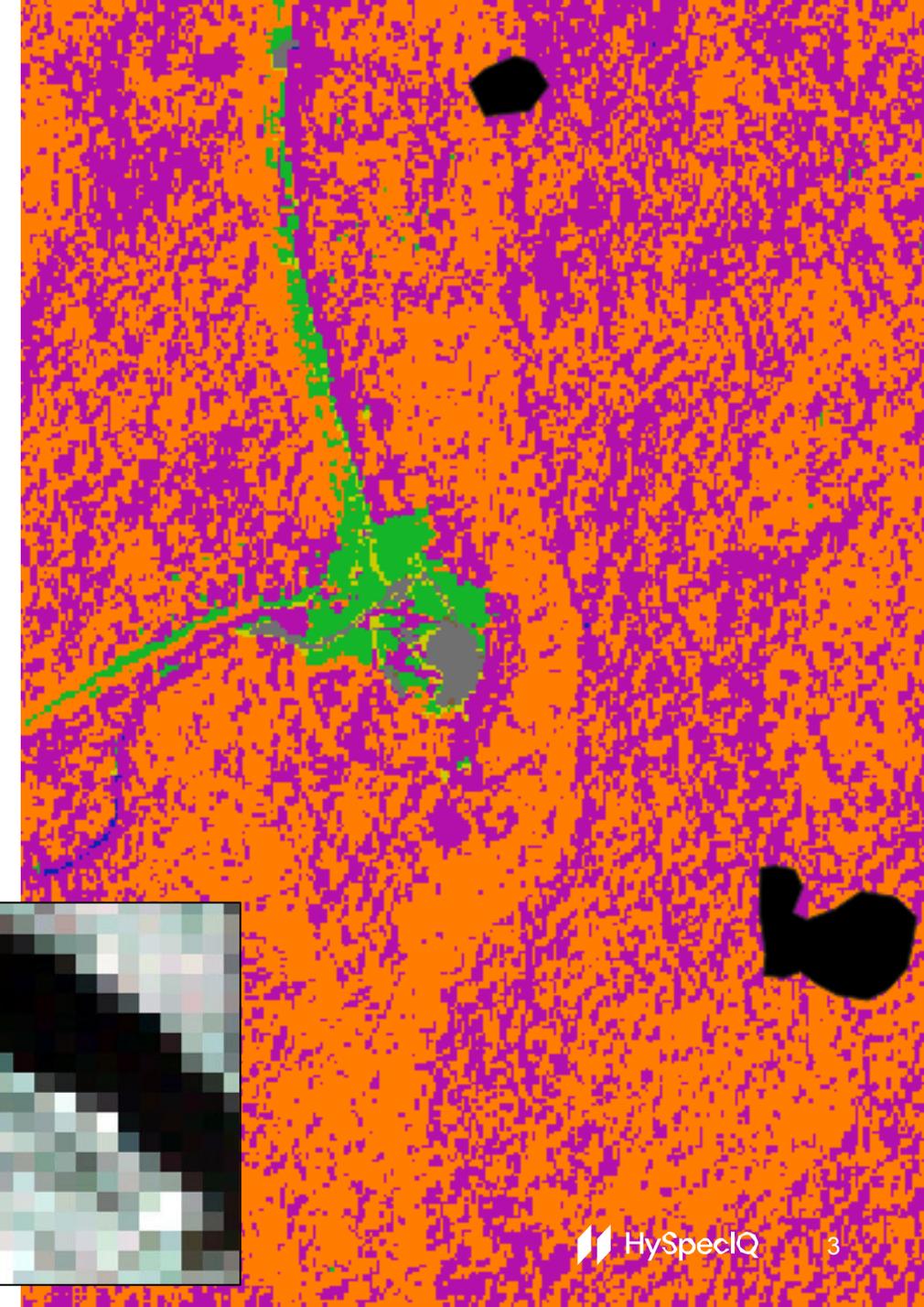
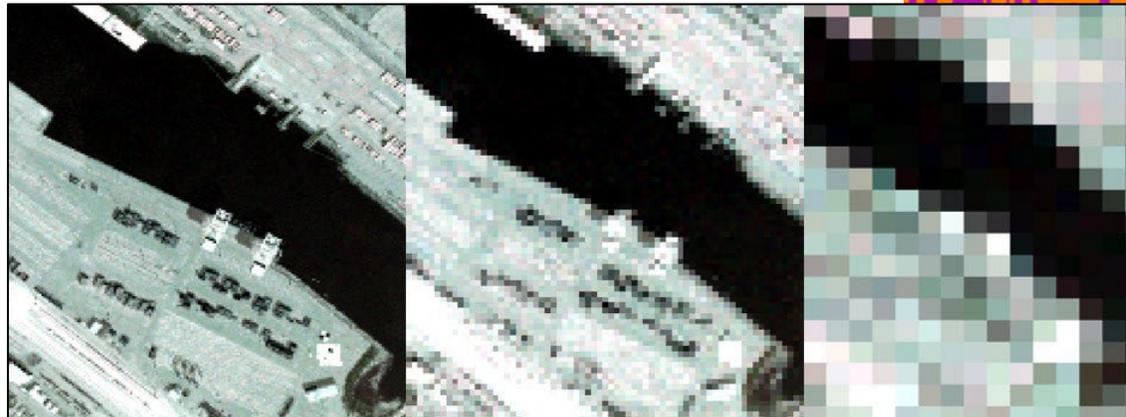
Drives us to a vehicle size significantly larger than cube sat
Spectral bands of 20nm chosen to detect distinct signatures

High signal to noise ratio for image accuracy

Low noise cooled FPA 0.4 - 2.4 μ m

HySpecIQ is currently modeling end-to-end performance and end products using image simulation of targets

Also developing a full suite of in-lab and in-situ capabilities for optimized radiometric performance



HySpecIQ System Overview

First launch in late 2023, 2nd launch equals IOC

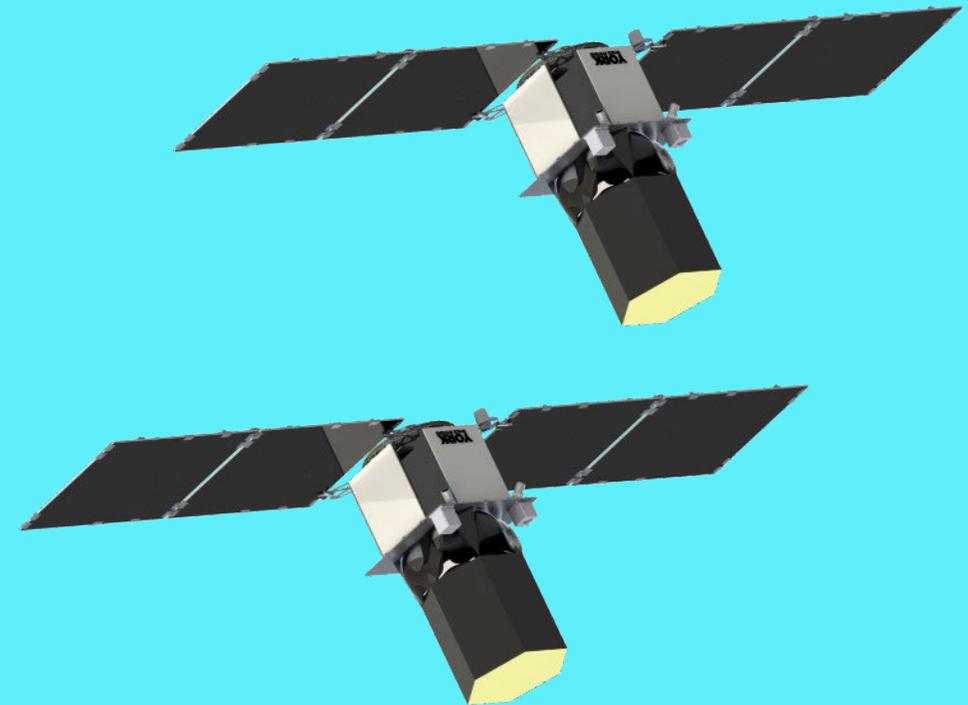
Constellation of initial 2 + 10 added satellites deployed to meet incremental market demand

400kg Class Satellite uses York Space Systems LX Class bus optimized for remote sensing payloads

0.5 m approximately f/2.5 Optical Sensor

Ka-band >1Gbps data downlink enables high throughput optimized collection every rev

480Km SSO with 7-day ground track repeat and target revisit every 3 days



HySpecIQ Revisit Enables Response to Customer Requests

Fort McMurray Oil Sands, AB, 57°N



4 times a week, Feb-Oct

Paradise, CA, 40°N



2 times a week, full year

Washington, DC, 38°N

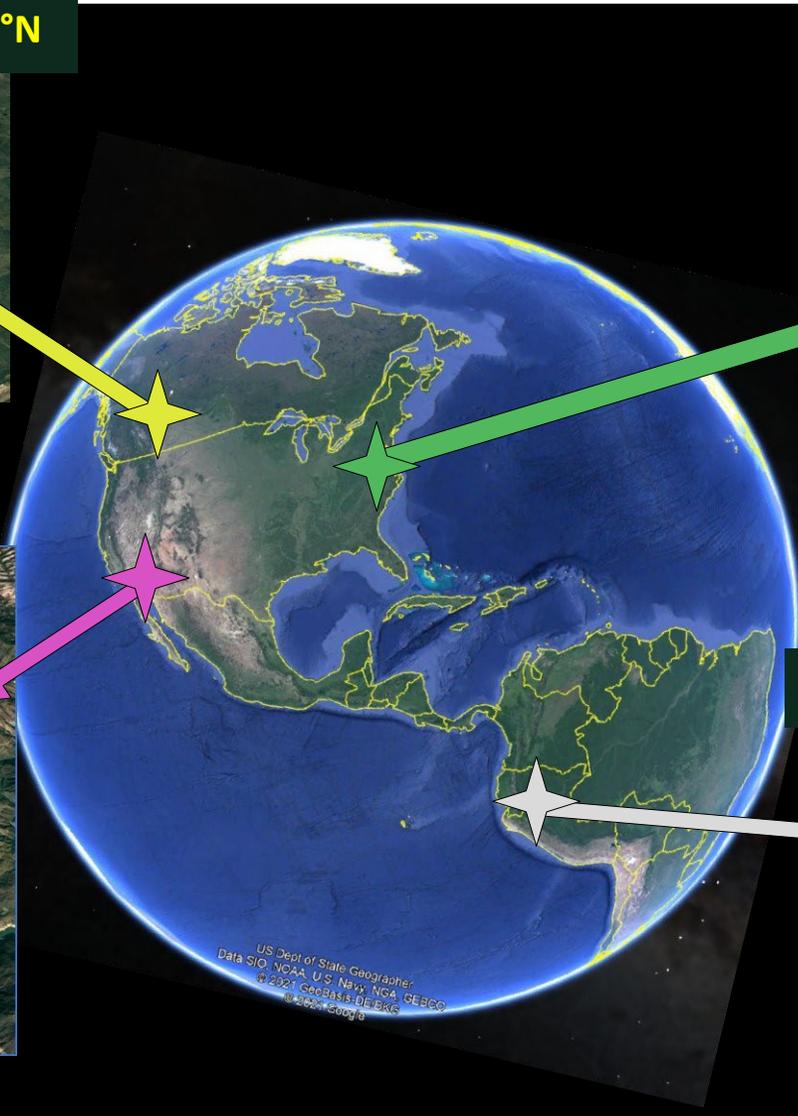


2 times a week, full year

Volcano Cotopaxi, Ecuador, 0.5°S



2 times a week, full year



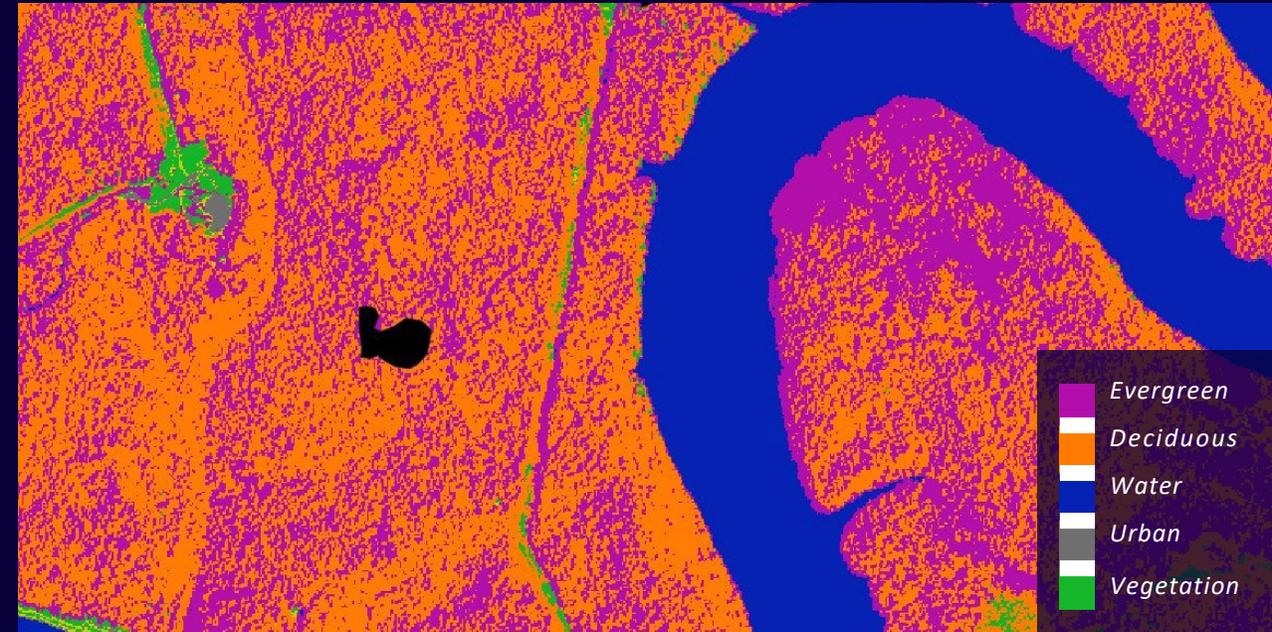
Hyperspectral imaging completes the picture offered by traditional satellite imaging



Traditional satellite imaging

Detect shape, location

<10 spectral bands (PAN, RGB, VNIR)



Hyperspectral imaging

Over 100 spectral bands 20nm wide each for distinct spectral signature

Designed to integrate into commercial market workflow

Technology developed for defense has wide commercial applications

-  Energy
-  Geological/Mining
-  Insurance
-  Environmental, Social, and Governance
-  Agriculture

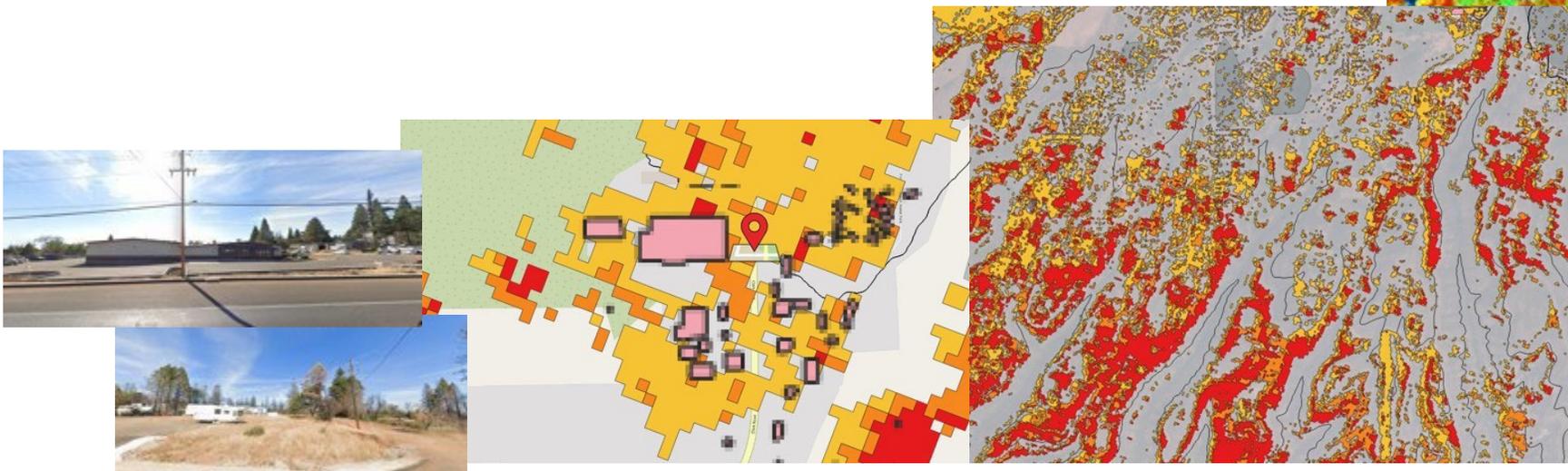
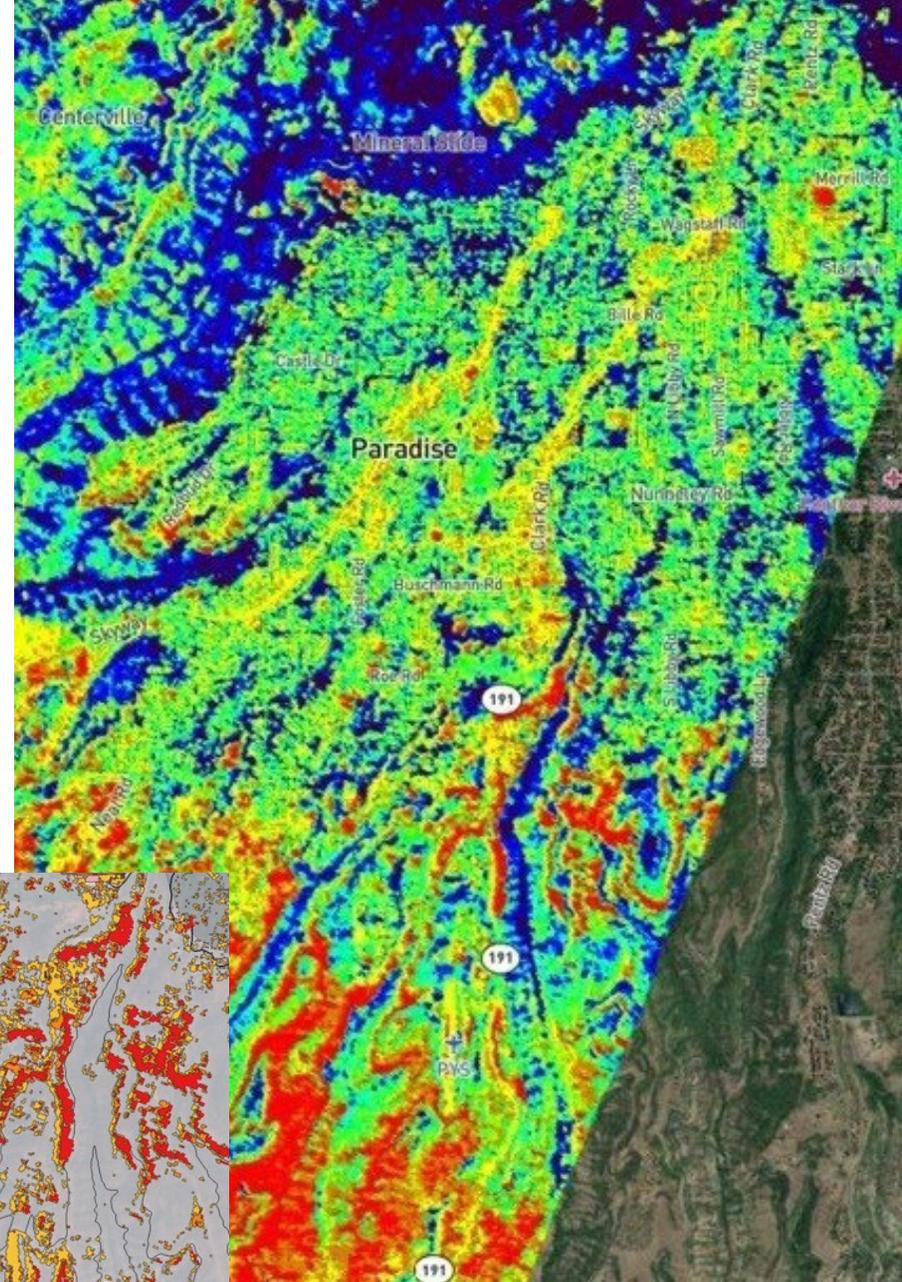


HySpecIQ HSI technology

HySpecIQ's processing engine is being developed to integrate products into varied client workflows

Satellites are built with highly repeatable low cost & low time to build optics and standardized bus

Analytics engine translating complex HSI data into actionable answers based on multiple modalities



Example Agriculture Sector

Need

Provide situational awareness for farmland management efforts

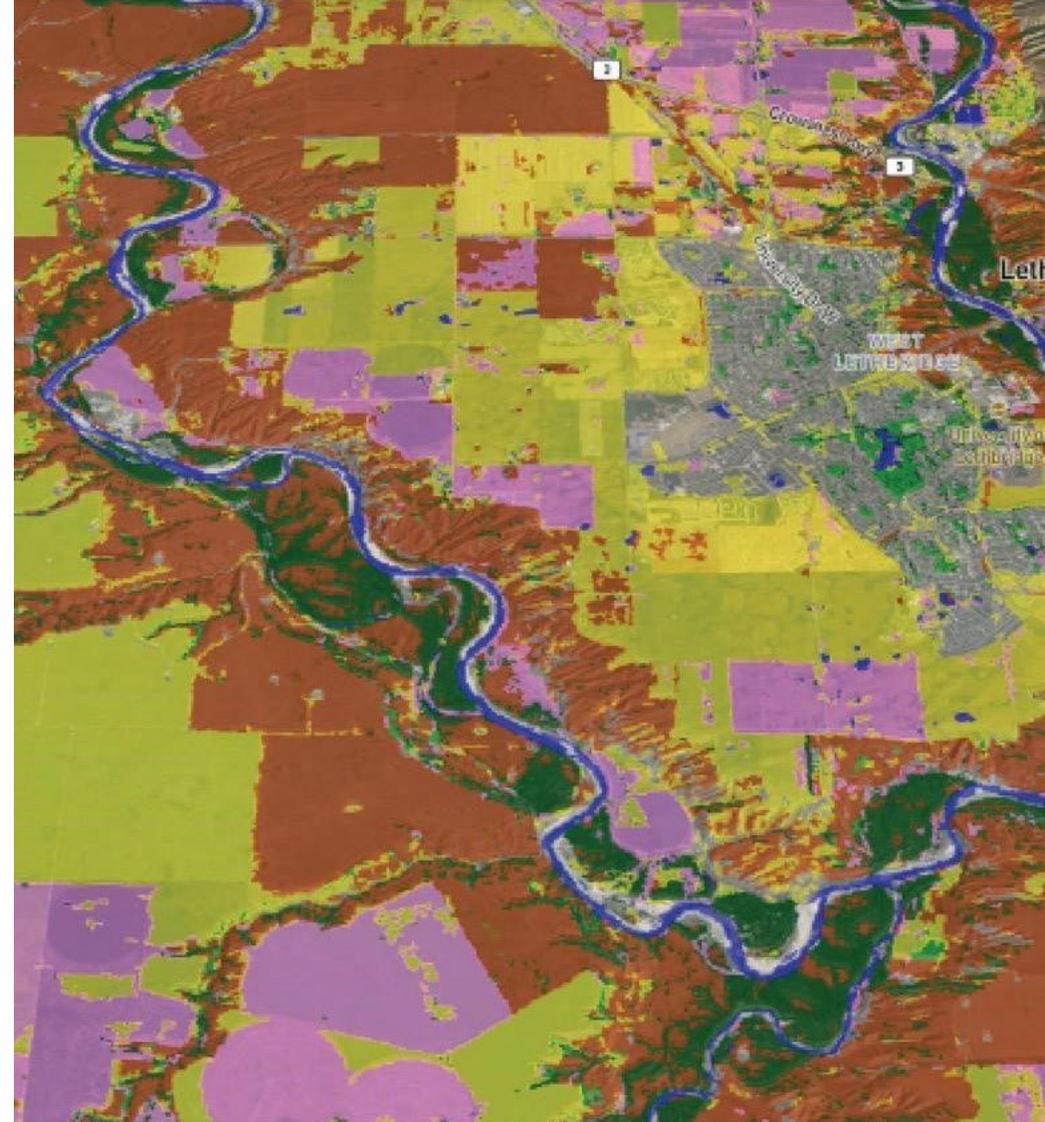
HySpecIQ

With high spatial and spectral resolution, we can accurately identify, quantify, and track changing crop and field conditions

Applications

- Monitor pesticide effects of environment, such as runoff, after application
- Identify invasive plant species for targeted eradication
- Our GSD coupled with the analytics of changes allows action to be taken earlier based on carefully chosen point targets
 - Identify affected crops before affliction spreads
 - Predict crop yields and timing

Pilots & Partnerships in this and other sectors are currently in development



HSI analysis uses spectral signatures to monitor farmland activities



Hyperspectral Imaging Platform for Transformational Solutions

Charles Mondello
cmondello@hyspeciq.com
(571) 786-1745

