PCI Geomatics for environmental monitoring applications – A look at data pre-processing and analysis

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Presenter

Stewart Wyseman
Territory Manager
Africa, Europe and Eurasia
wyseman@pcigeomatics.com

PCI Software & Systems

GEOMATICA — Powerful Image Analysis Software

OPTICAL / RADAR ANALYSIS: ROBUST , ACCURATE, FAST

GXL — High-Volume Production Software

PERFORMANCE / STREAM-LINED WORKFLOW

HAP — Historical Airphoto Processing Software

REPEATABLE WORKFLOW : MULTI-PASS IMAGE ALIGNMENT

Information Automation (GEOMATICA + Python)

PURPOSE-BUILT WORKFLOW: INTEGRATION

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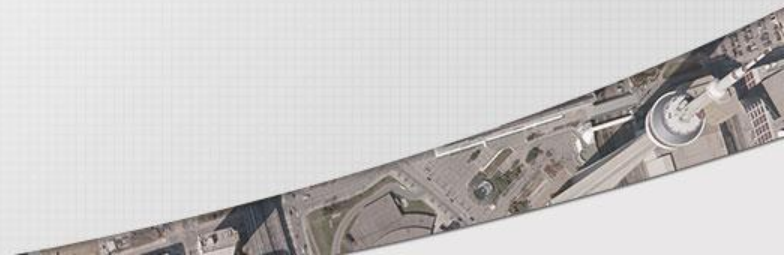
Geomatica Environmental Preamble

- Environmental concerns are a major concern around the world
- Climate change, sea level rises, deforestation, access to fresh water, food shortages, extinction are a few examples of some of the major concerns

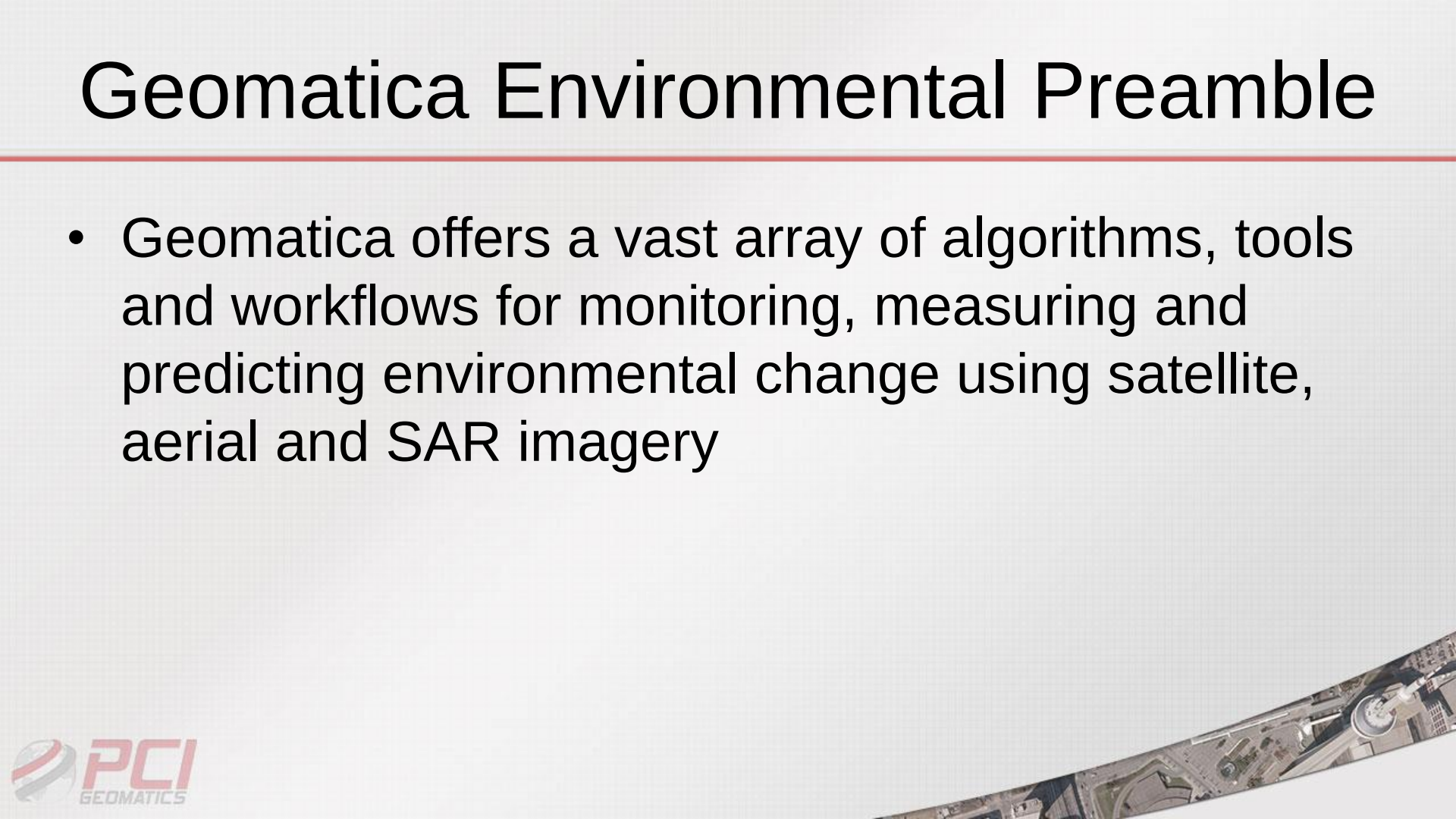


Geomatica Environmental Preamble

- Since 1972 (Landsat-1), environmental remote sensing has been an invaluable method for:
  - Monitoring environmental change
  - Measuring the extents of change
  - Measuring the rates of change
  - Inputs to prediction models

Geomatica Environmental Preamble

- Geomatica offers a vast array of algorithms, tools and workflows for monitoring, measuring and predicting environmental change using satellite, aerial and SAR imagery



Crop Monitoring & Yield Assessments

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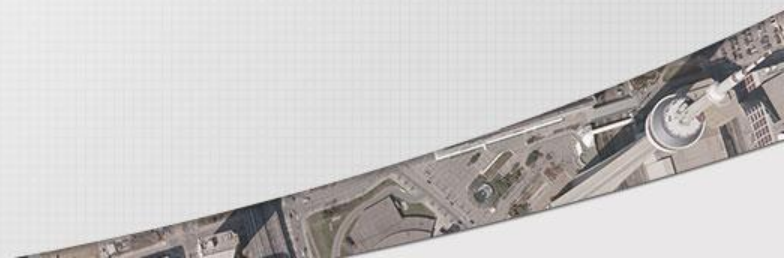
What is Crop Monitoring & Yield Assessments

The practice of monitoring crop conditions to effectively estimate seasonal yield.

What is Crop Monitoring & Yield Assessments

Common crop condition monitoring and yield assessments tasks:

- Monitoring vegetation growth cycles and stages
- Monitoring crop performance
- Observing the relationship between crop conditions and crop yield
- Predicting crop yield



Why Crop Monitoring & Yield Assessments

Agricultural Policy	
Global food security	Sustainable management of resources
Rural development	Agriculture biodiversity
Better management of economy	Climate change

Food and Agriculture Organization of the United Nations

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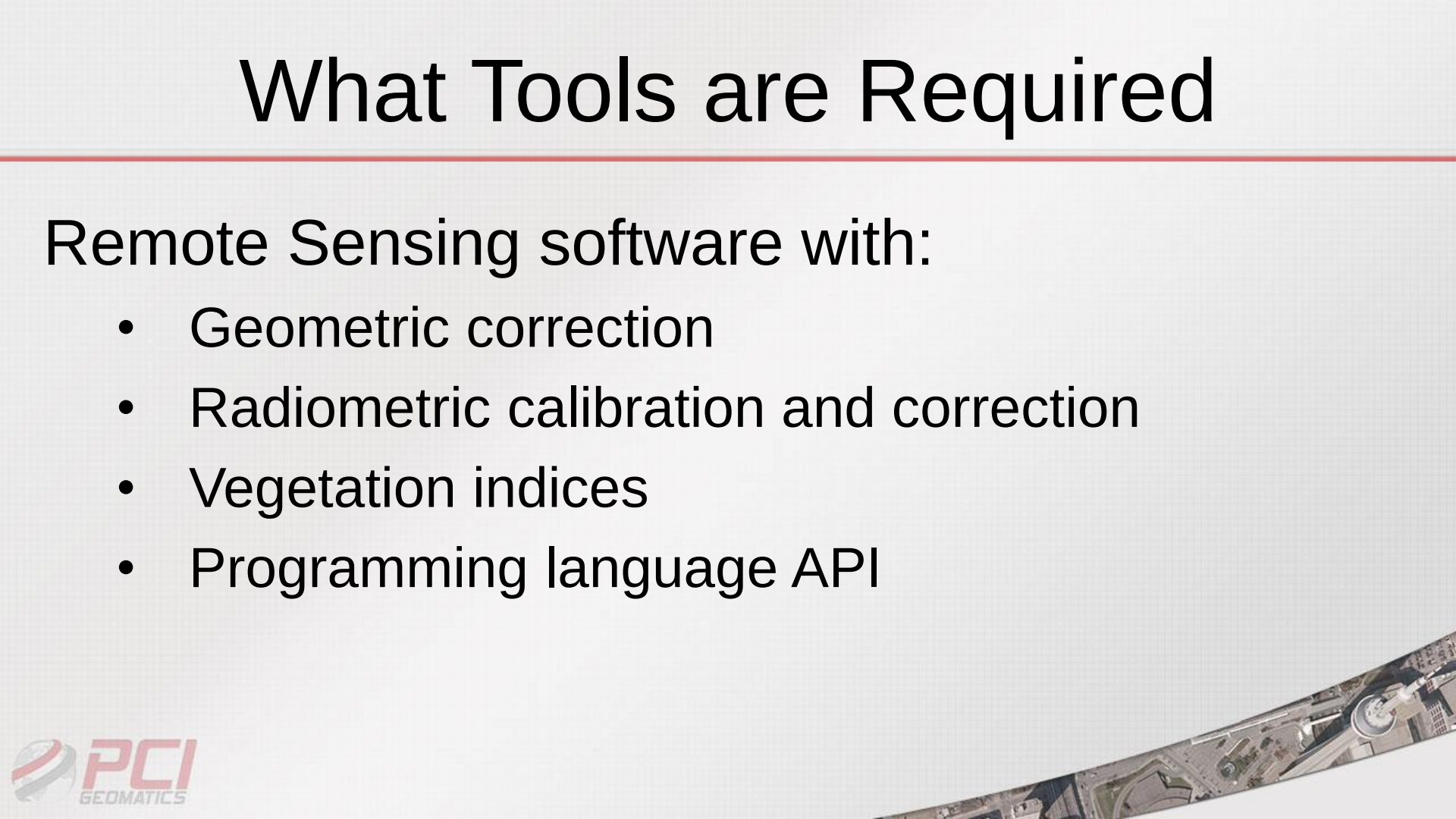
What Tools are Required

Remote Sensing software with:

- Geometric correction
- Radiometric calibration and correction
- Vegetation indices
- Programming language API



What Data is Required

- High to low resolution imagery with large swaths and appropriate bands (Red & NIR)

Common Sensors	Resolution	Availability
Landsat-7/8	15 - 30m	Public
MODIS	250m	Public
Rapideye	5m	Commercial
Sentinel-1	10m	Public
Radarsat-2	~1.5 - 5m	Commercial

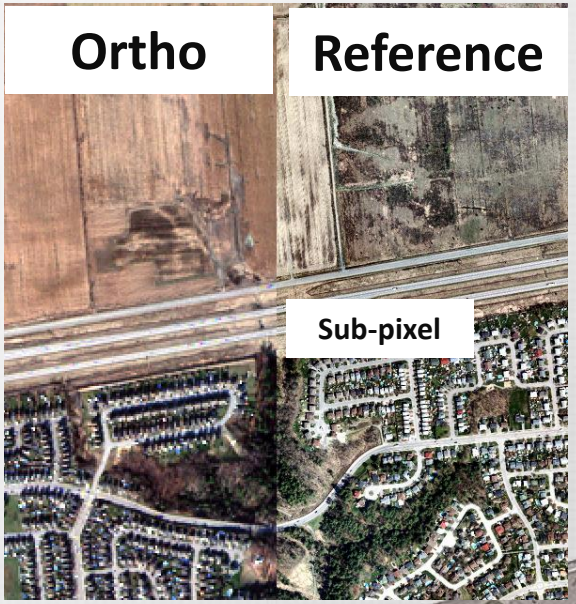
What Tools are Required

Geomatica's powerful and easy to use tools are ideal for crop condition monitoring & yield assessment applications

Crop Monitoring & Yield Assessments with Geomatica

Orthorectify Imagery → Atmospheric Correction → Vegetation Analysis → Time-Series Registration → Crop Monitoring Analysis

- High performance
- Fully automatic
- Capable of centimeter (sub-pixel) accuracy



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Crop Monitoring & Yield Assessments with Geomatica

Orthorectify Imagery → **Atmospheric Correction** → Vegetation Analysis → Time-Series Registration → Crop Monitoring Analysis

- Rapid and easy radiometric calibration and correction
- Accurate calculation of TOA and ground reflectance
- Required to perform many vegetation analysis and improves change detection

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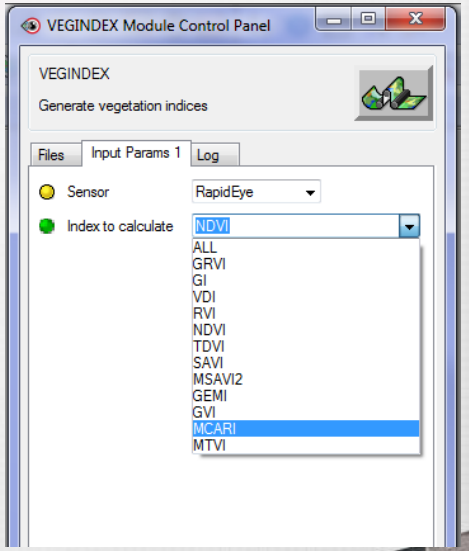
Crop Monitoring & Yield Assessments with Geomatica

Orthorectify Imagery → Atmospheric Correction → Vegetation Analysis → Time-Series Registration → Crop Monitoring Analysis

- Supports 12 common and advance vegetation indices
- Provides information for crop monitoring
- Fully automatic



python

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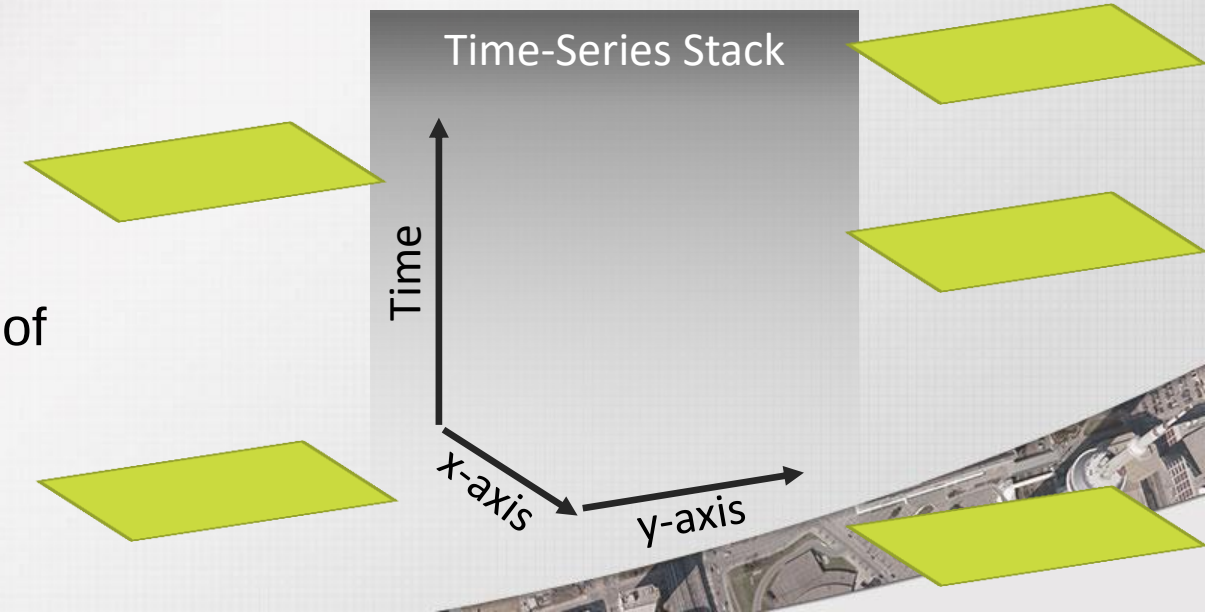
Crop Monitoring & Yield Assessments with Geomatica

Orthorectify Imagery → Atmospheric Correction → Vegetation Analysis → **Time-Series Registration** → Crop Monitoring Analysis

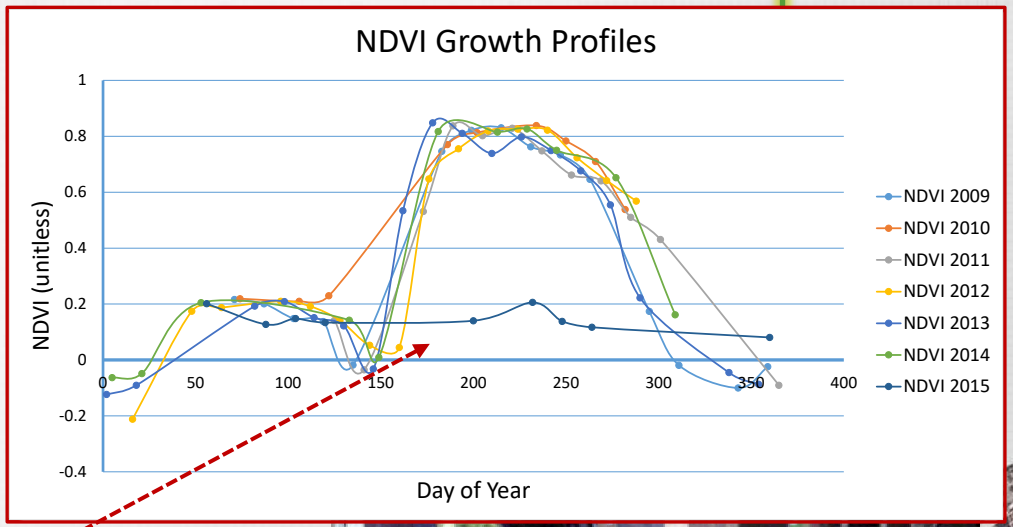
- Build time-series stack of imagery acquired at different times
- Better manage and centralize large amounts of imagery
- Fully automatic



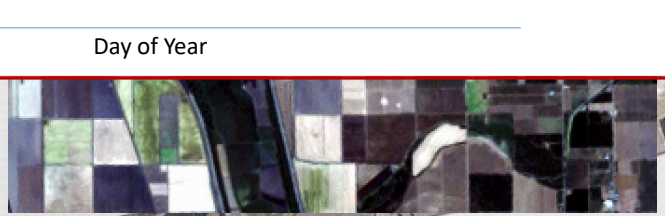
Crop Monitoring & Yield Assessments with Geomatica

Orthorectify Imagery → Atmospheric Correction → Vegetation Analysis → Time-Series Registration → Crop Monitoring Analysis

- Extract time series from image stack
- Produce NDVI growth profiles
- Generate other valuable statistics



Easily identify discrepancies or provide as input into forecast models



Contact PCI Geomatics

www.pcigeomatics.com
info@pcigeomatics.com