EcoSIS: Ecosystem Spectral Information System

An Online Open Source Database for Vegetation Spectra

EcoSIS Science Team

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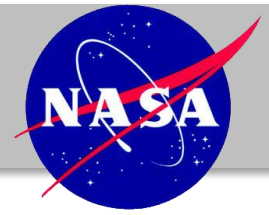
Database Developers

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EcoSIS

- EcosSIS is a data archiving (online spectral library)

- EcoSIS = enhancing user access to data

  [metadata, ancillary measurements]

- EcoSIS = discovery [tools for data integration]

- EcoSIS = data and what we do with it.

Objectives:

Archiving, Access and Discovery!
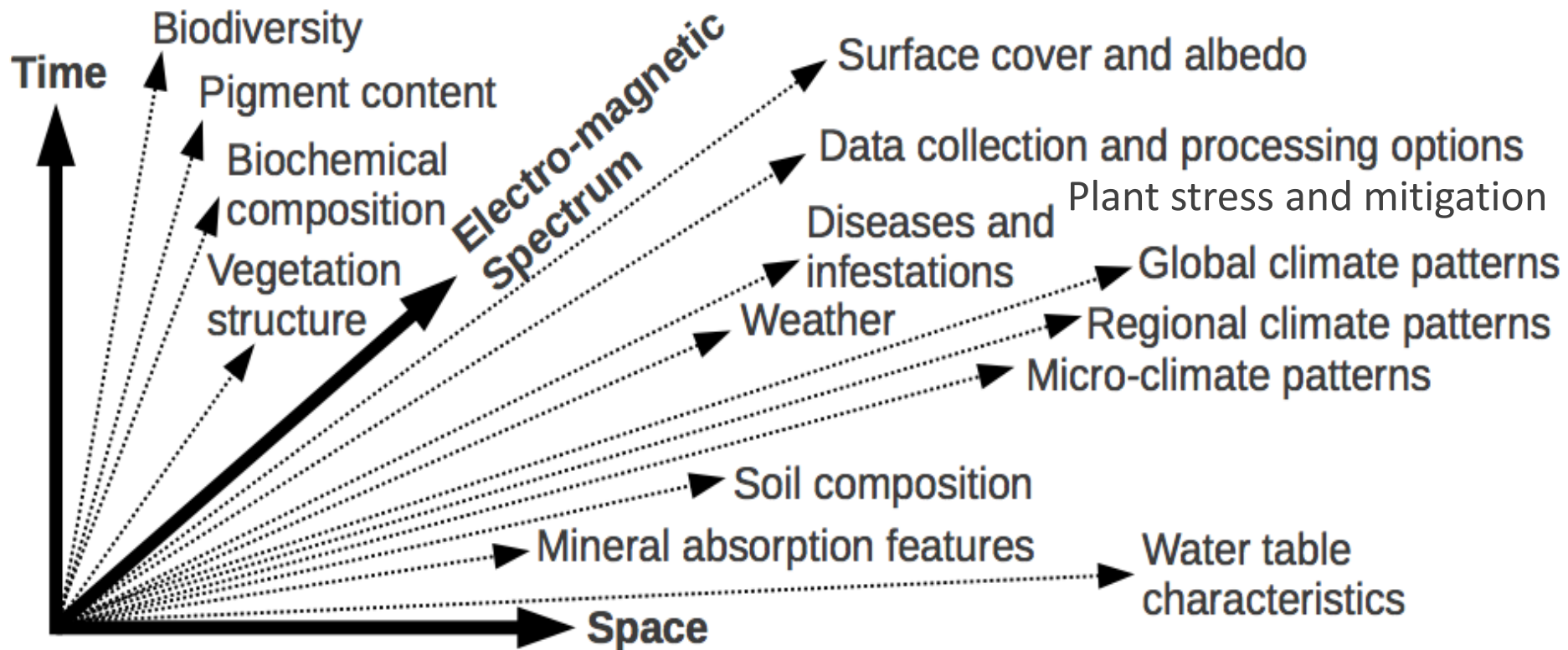
EcoSIS Objectives
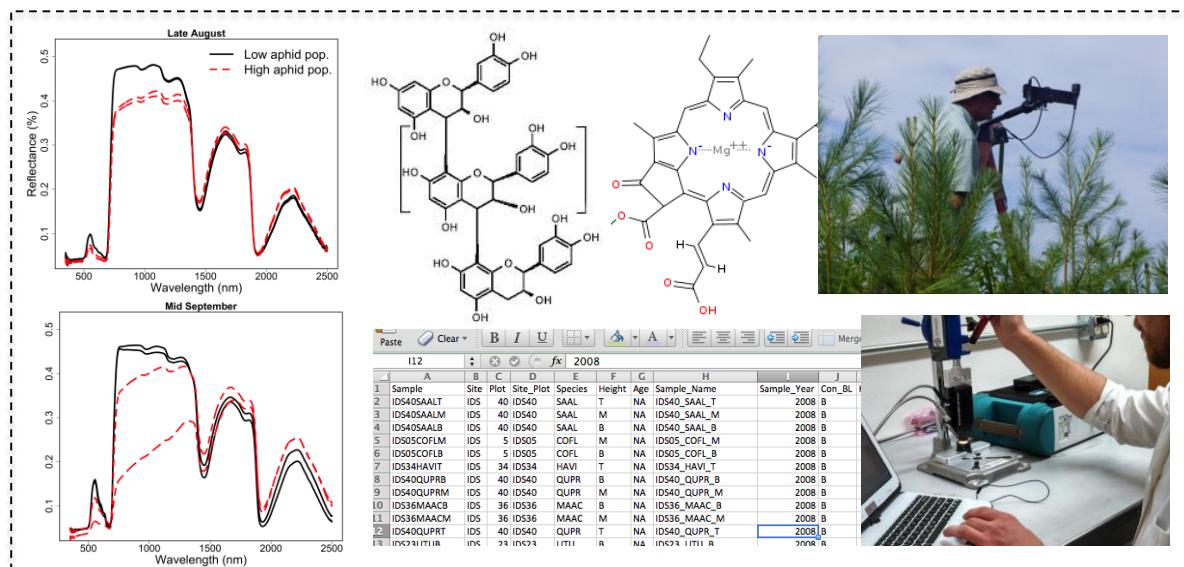
- **Motivation for EcoSIS**: Spectral vegetation library
  - A tool for synthesis and discovery
  - Promotes synthesis science, remote sensing and model assimilation
    - Analog to traits databases
    - Access to training and validation data
  - Protects IT of data providers (assign DOI)
- **Develops Upload/Search Software** for Database
- **Develop EcoSIS metadata** to foster discovery
- **Tools for spectral data processing** and enhancement

EcoSIS

Software is being designed to:

- Accept many data formats (make it as easy as possible to upload)

- Accept metadata as input by the user (make it as easy as possible)

- Cross-walk terms where possible

- Emphasize search tools, sub selecting data, simple statistics and quality assessment tools

- Built on CKAN open source database portal (http://ckan.org/#sthash.IsRo6TsK.dpuf)

- Output data in standard formats

- Connects to other analytical software for analysis

Spectral data are "proxy" measurements for underlying
plant properties and ecosystem functions that are
costly, impractical, inconvenient or impossible to characterize
at broad spatial and temporal scales

Metadata Dimensions *for optical data in vegetation monitoring*

Time

Biodiversity
Pigment content
Biochemical composition
Vegetation structure

Electro-magnetic Spectrum

Surface cover and albedo
Data collection and processing options
Plant stress and mitigation
Diseases and infestations
Weather
Global climate patterns
Regional climate patterns
Micro-climate patterns
Soil composition
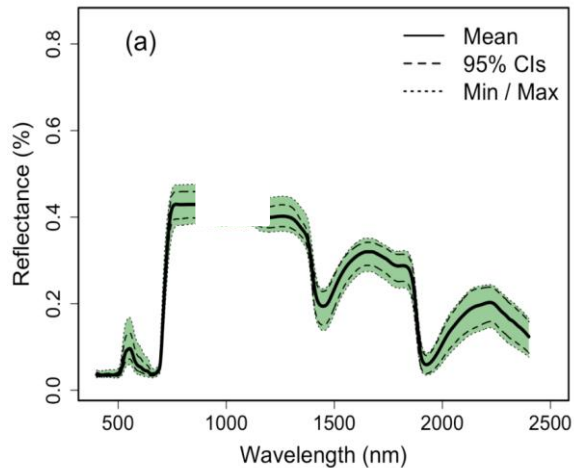Mineral absorption features
Water table characteristics

Space

Spectral data provide the basis for understanding
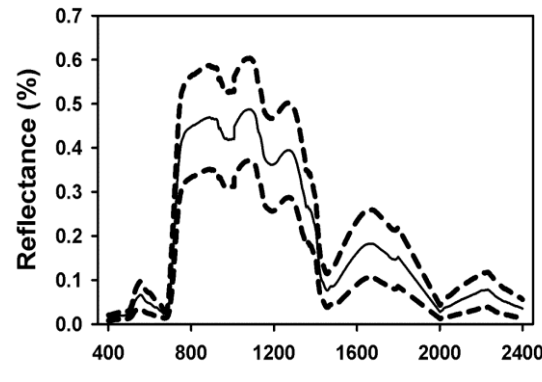plant or ecosytem functioning due to well-known
– and some not so well understood – optical properties
associated with leaf/canopy structure, biochemistry, physiology, etc.
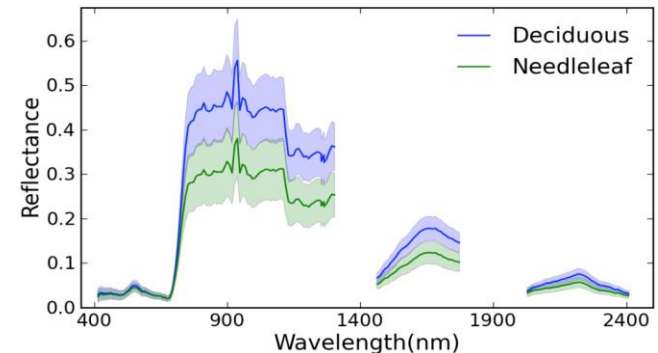*In situ* **spectral data are critical to scaling to remote sensing imagery**
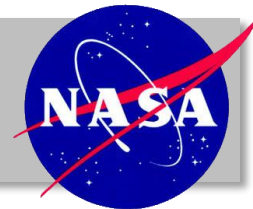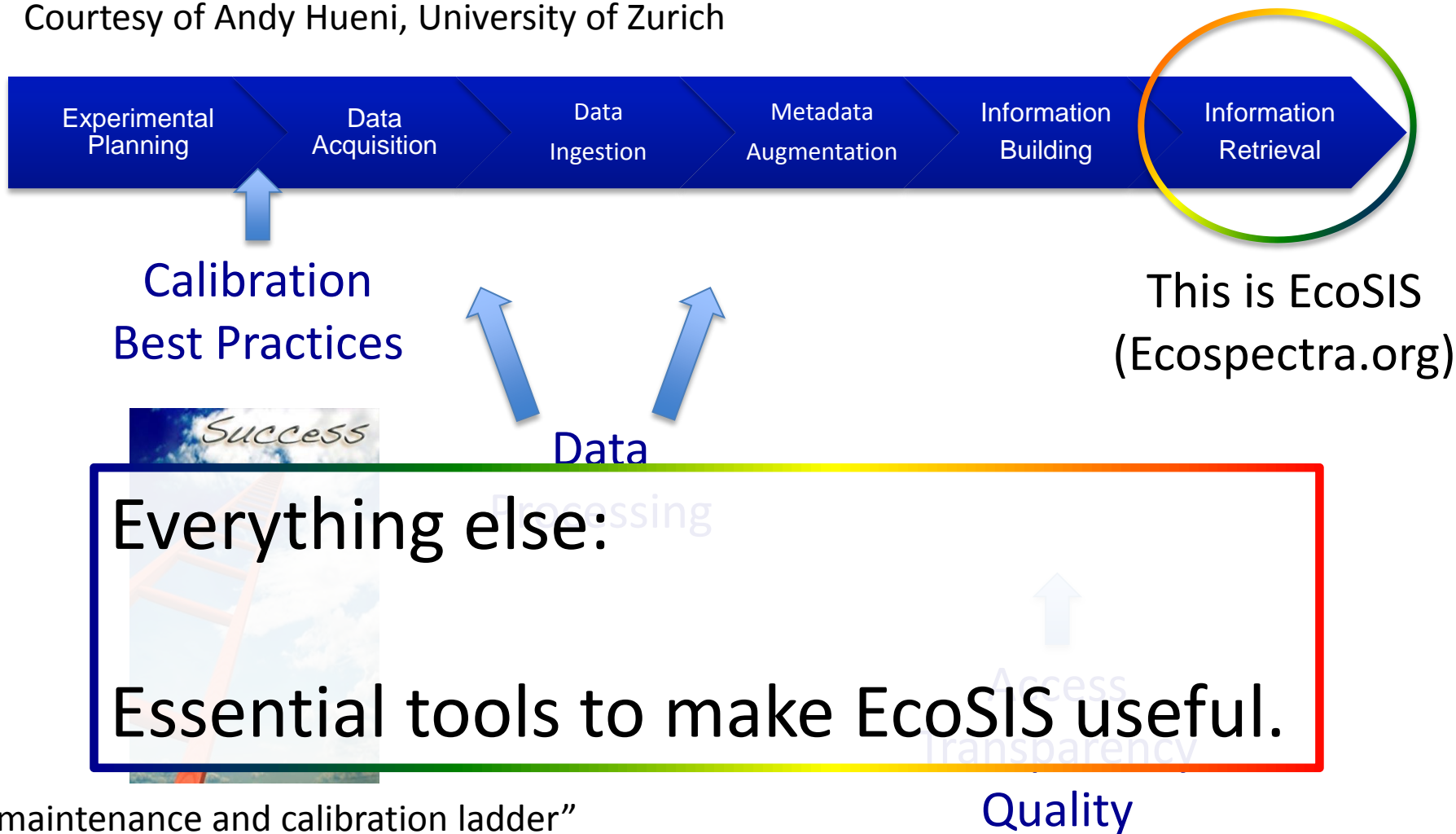
Leaf

Canopy

Landscape

Spectral Data Life Cycle

Courtesy of Andy Hueni, University of Zurich

Experimental Planning	Data Acquisition	Data Ingestion	Metadata Augmentation	Information Building	Information Retrieval

Calibration
Best Practices

This is EcoSIS
(Ecospectra.org)

Data
Processing

Everything else:

Essential tools to make EcoSIS useful.

Access

Transparency

"maintenance and calibration ladder"

Quality

EcoSIS

https://docs.google.com/file/d/0B_7cUV-o2QQYZEloMWd3WFhadE0/view

Plans for the this year:

- Populating the database

- Release database to public (around HyspIRI fall meeting)

- Synthesis studies and publication

- Long-term maintenance and plans

EcoSIS Plans to develop:

- Best Practices Manual

- Metadata Standards

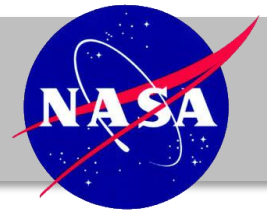- Standard terminology and crosswalk for common use terms

EcoSIS Workshop

Support from:

- Terrestrial Ecology Program
- Separate Workshop Grant
- Diane Wickland

- Woody Turner, HyspIRI
- Department of Forest & Wildlife Ecology, U Wisconsin

Workshop Outcomes

- Assessment of functionality
- Understand and settle on metadata
- Commitment to populating EcoSIS (U.S. NASA-funded community)
- Requirements for open source tools
- Synthesis and future