# Imaging Spectroscopy Processing Environment on the Cloud (ImgSPEC): A Prototype of an Open Science, Scalable Processing Environment

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PRESENTED AT:
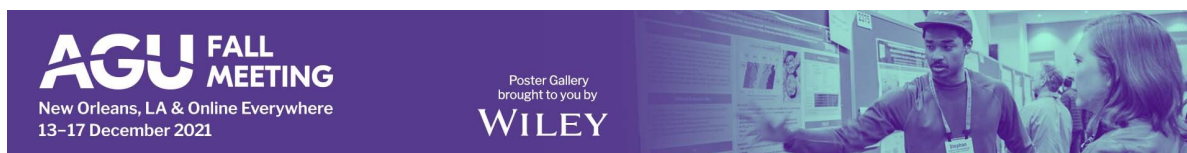
IMGSPEC VALUE PROPOSITION

ImgSPEC prototypes and refines open science use cases for using open diverse open data across missions by stress testing boundng conditions on contributions by users outside of NASA missions for on-demand product generation.

INSPIRATION

Imaging Spectroscopy is high dimensionality spectral data and is rapidly emerging as a go-to data source for many applications such as characterizing biodiversity and quantifying plant traits and ecosystem function.

PROBLEM DEFINITION

A broader community wants to make use of these data, but may not have the expertise or interest in processing the data themselves.

Likewise, agencies or other product developers may not have the capacity to generate all possible products and distribute them.

Finally, to make use of these products, we need more than Imaging Spectroscopy to accelerate scientific understand of the Earth system.

Datacubes, stacks of remote sensing data pertinent to a single domain of study or application, over ecological national observatories (NEON, LTER, and LTAR) would require >590 TB of data storage!

We cannot do what we have always done!

We cannot rely on a single project to create information products that can be downloaded and processed locally.

VISION AND OBJECTIVE

ImgSPEC **vision** is to provide an open source science platform that supports analysis by *diverse* perspectives through *inclusive* collaboration, that increases *access* to data, data tools, and compute resources.This Enables us to take advantage of the information age to provide decision support* with scientific advancement using *analytics by many* to create relevant information from the wealth of big data

ImgSPEC **objective** is to prototype and demonstrate an end-to-end, on-demand, processing platform on the cloud for imaging spectroscopy Level 1 calibrated radiance data through Level 3+ information products for the terrestrial biodiveristy use case.

DESIGN THINKING FOR DIFFERENT USERS AND CORE FUNCTIONALITY

There are many potential users of ImgSPEC:
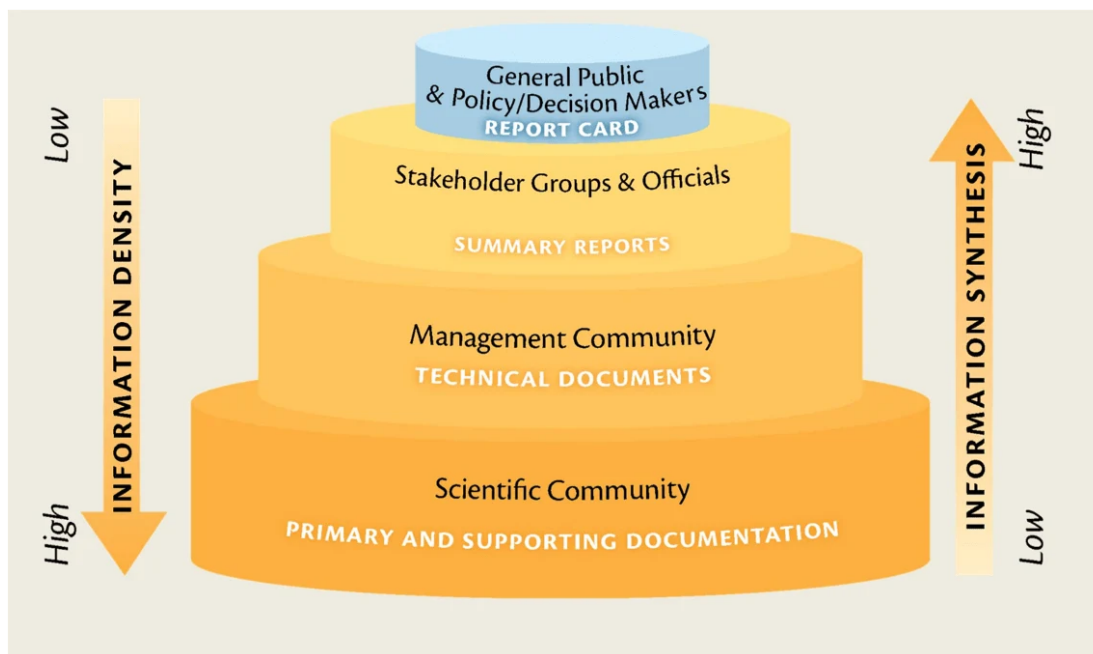
Manager using data visualizations to inform decisions

Field scientist interested in point locations

Educator/Student working on limited scope class project

Researcher conducting statistical and modeling experiments

Remote Sensing algorithm developer

Software developer generating tools and services

Technician providing data processing support

This results in providing core functions:

ImgSPC System Design