

Imaging Spectroscopy Processing Environment on the Cloud (ImgSPEC; aka GeoSPEC)

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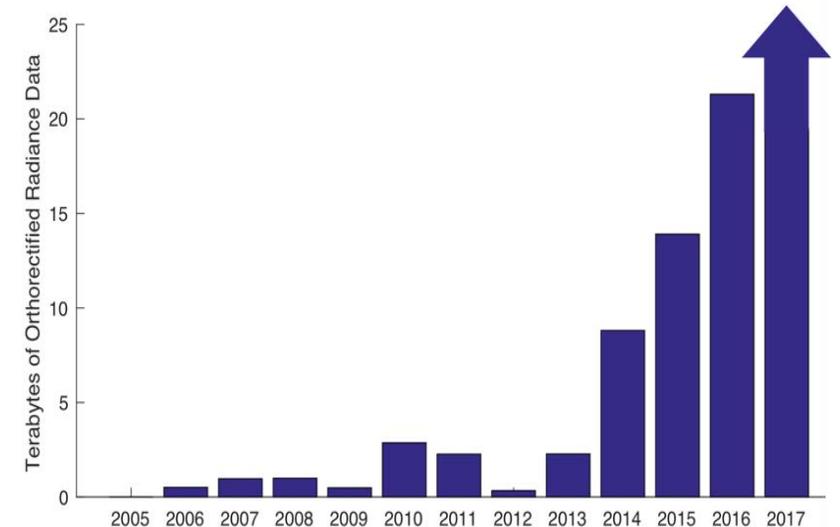
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Program: AIST-18

(please see the PowerPoint notes section below for some tips)

Problem to Solve

- Current airborne campaigns and ESAS 2017 prioritized global spaceborne imaging spectrometer
 - Large volumes (~20 TB/day) of high dimensional (>224 bands) continuous, narrowband data
 - Wide range of uses: terrestrial and aquatic ecology, hydrology, and geology
- Analysis from Level 1 to L3+ products is substantial, and may vary by biome or season
- Many users lack the expertise, resources or desire to perform all processing steps

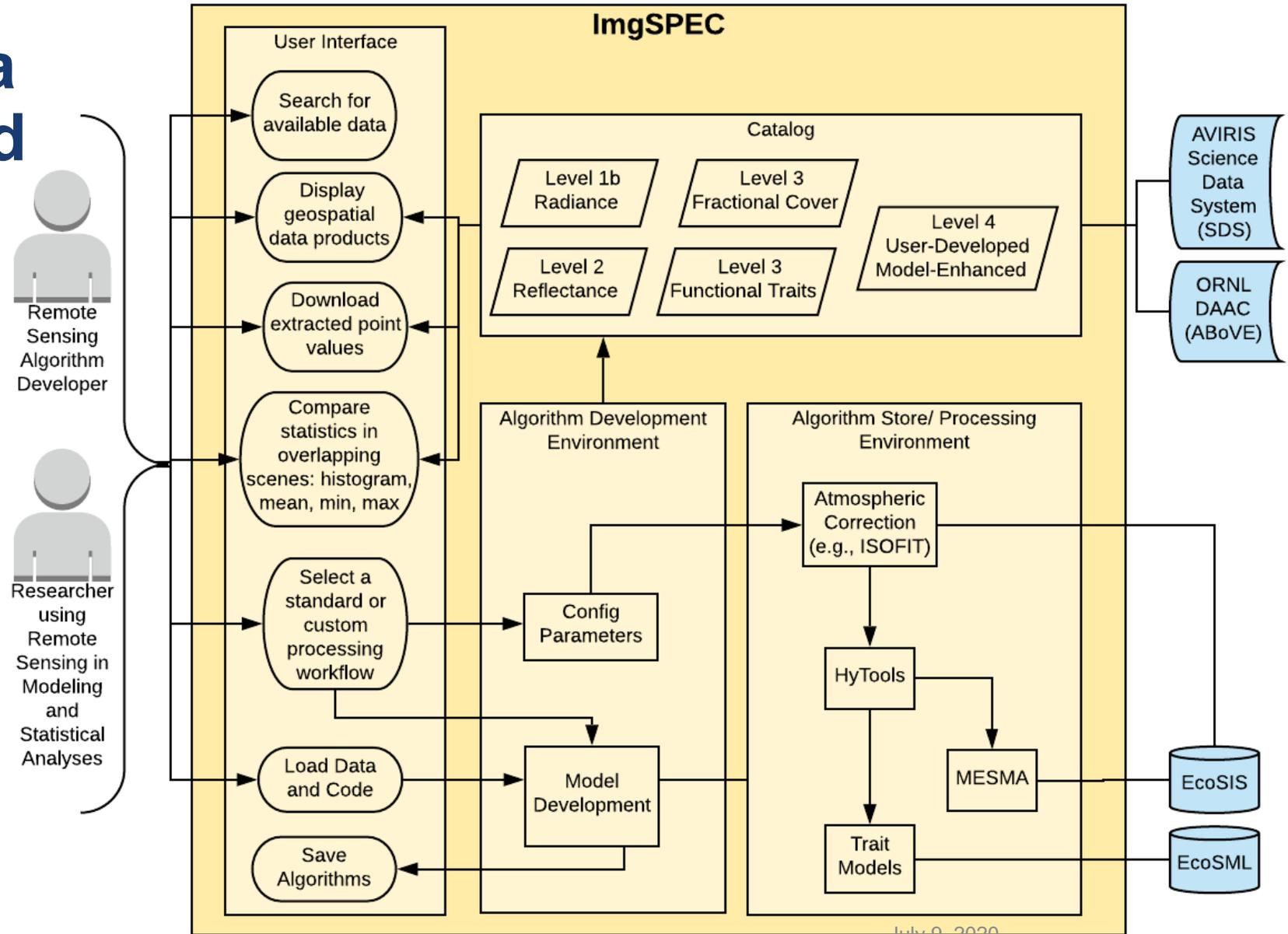


Solution

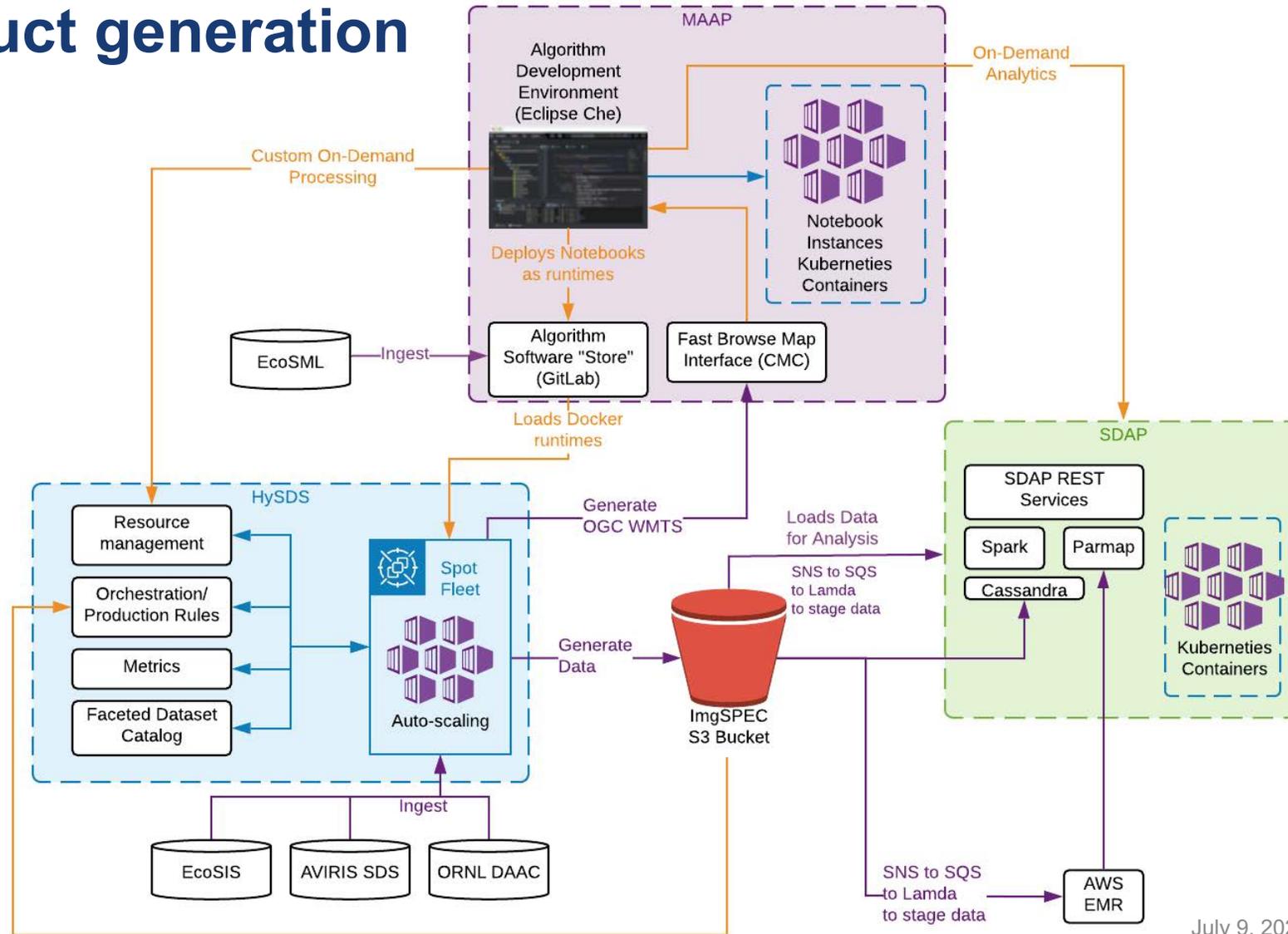
- The ImgSPEC premise is that data distribution from SBG will differ dramatically from current approaches; specifically, in relation to the number of potential products, algorithms, and pre-processing steps
- Rather than locking users into a specific processing flow, ImgSPEC provides on-demand, customized processing workflows:
 - Maintain provenance
 - Enable Reproducibility
 - Limit data download bottlenecks
 - ***Limit scope of development of all possible SBG products***
 - ***Limit costs for reprocessing an entire data set when algorithms improve***
- ***Objective:*** 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

ImgSPEC Use Case Diagram

ImgSPEC is a user-centered design and prioritizes functionality based on interviews with sister AIST Biodiversity projects



ISPEC design leverages component technologies to create a novel cloud-based science data system that enables algorithm development and custom, on-demand product generation



Next Steps / Contributions

- We conducted a user needs assessment
- Defined project functional requirements
- Beginning defining interfaces
- Begun containerizing PGEs
- Set up our AWS environment
- First system test (default workflows) is at the end of FY20
- Publication in review at HBR on the user-centered design approach with ISPEC as the case study



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