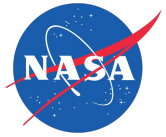
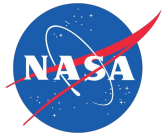


User Metrics in NASA Earth Science Data Systems

Chris Lynnes, NASA



User Surveys

American Customer Satisfaction Index (ACSI)

- Annual survey of registered users of EOSDIS*
- Output
  - Customer Satisfaction Scores
  - Text comments
- 7500 responses in 2017

*Earth Observing System Data and Information System

ACSI Scores by User Type

	2017		
	%	N	CSI
Type of User~			
Earth Science Researcher	32%	2,409	79
University Graduate Student	29%	2,204	77
University Professor	16%	1,193	81
General Public	14%	1,037	76
University Undergraduate Student	9%	656	76
Other User Type	9%	656	77
Earth Science Modeler	9%	650	79
Decision Support Systems Analyst	6%	429	76
Data Tool Developer/Provider	5%	409	77
Other Education and Outreach	5%	355	79
Non-NASA-affiliated Scientist	4%	320	78
NASA-affiliated Scientist	1%	102	80
School Teacher	1%	86	77
NASA Science Team Member	1%	68	80
Number of Respondents	**7,505**	**7,505**	**7,505**

Sample Comments

“The 2000 file limit for HTTPS downloads is a huge problem. Bump that limit up to 1,000,000 or remove the limit altogether.”

“Make daily ice data (ice concentration), as close to real-time and archived, more easily available in a format that can be easily used in ArcMap.”

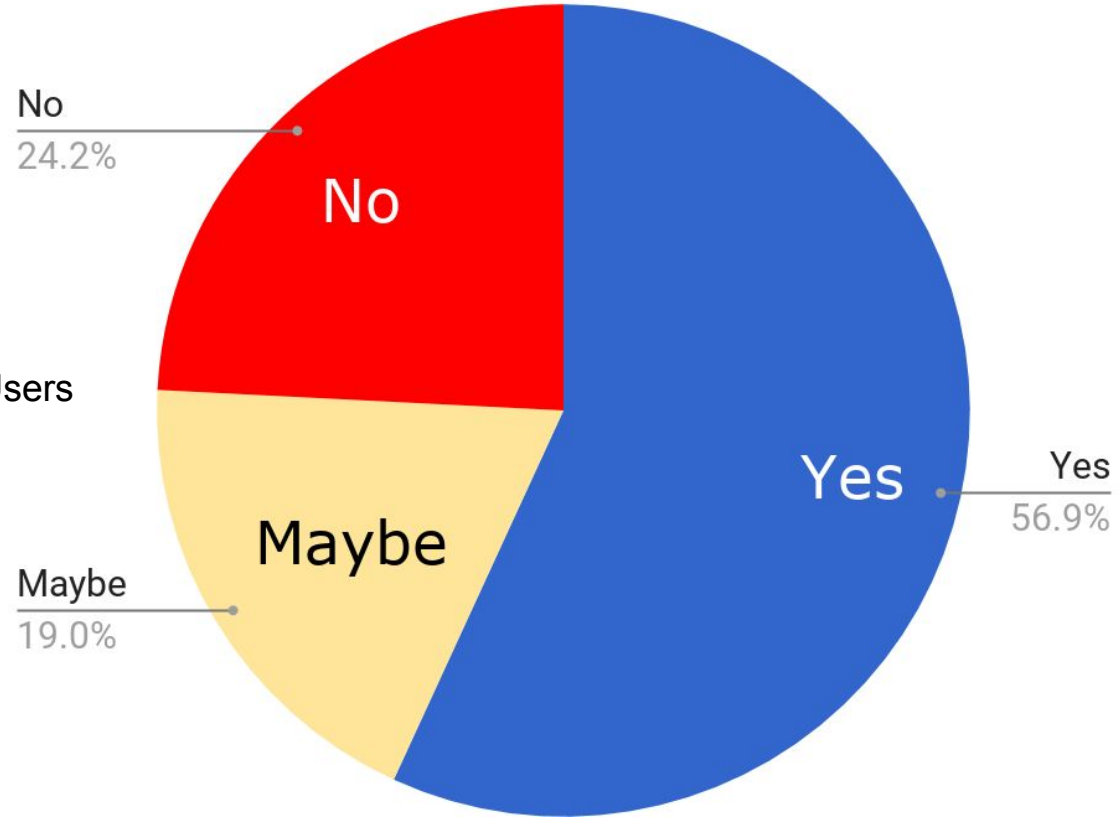
Sample Cloud Comments

Q: *If you had access to cloud processing, would you use it? Please tell us why or why not.*

- “Yes, because I can store a lot of process data and use memory and storage resources in large quantity”
- “I am not sure - cost would be an issue. Ease of porting my software to the cloud environment another.”
- “No, slow internet.”

Cloud Adoption Sentiment

248 Responses from
Alaska Satellite Facility Users



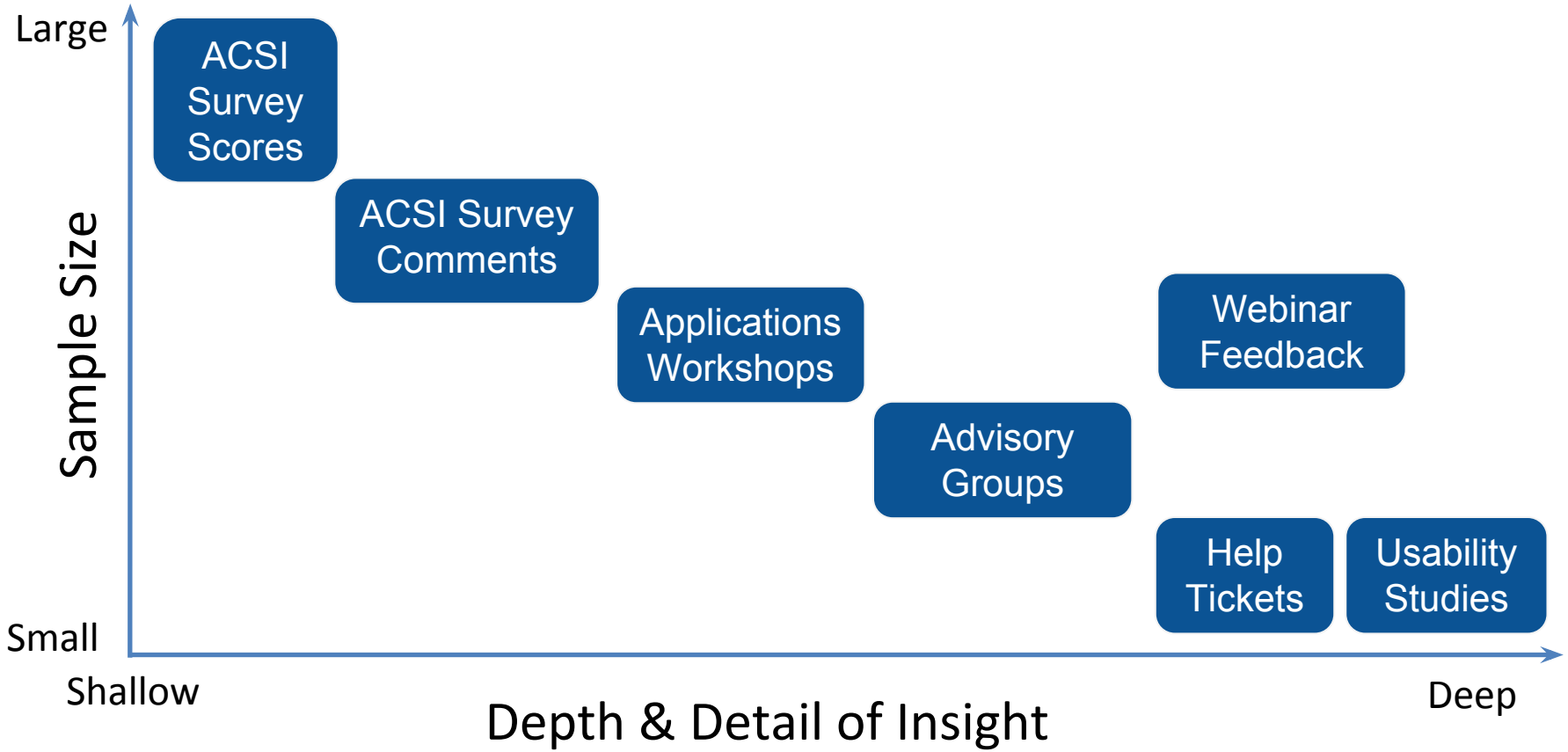
Webinar Surveys

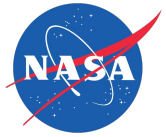
Surveys given at the start or end of a Webinar

- Applied Remote Sensing Training
- EOSDIS Outreach Webinars
- WGISS* Outreach Webinars?

*Working Group on Information Systems and Services

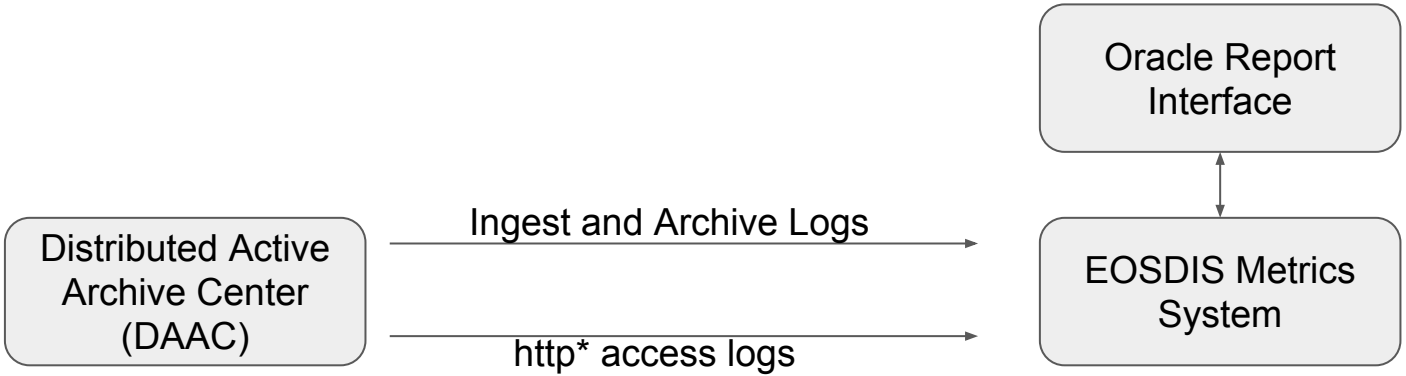
User Feedback





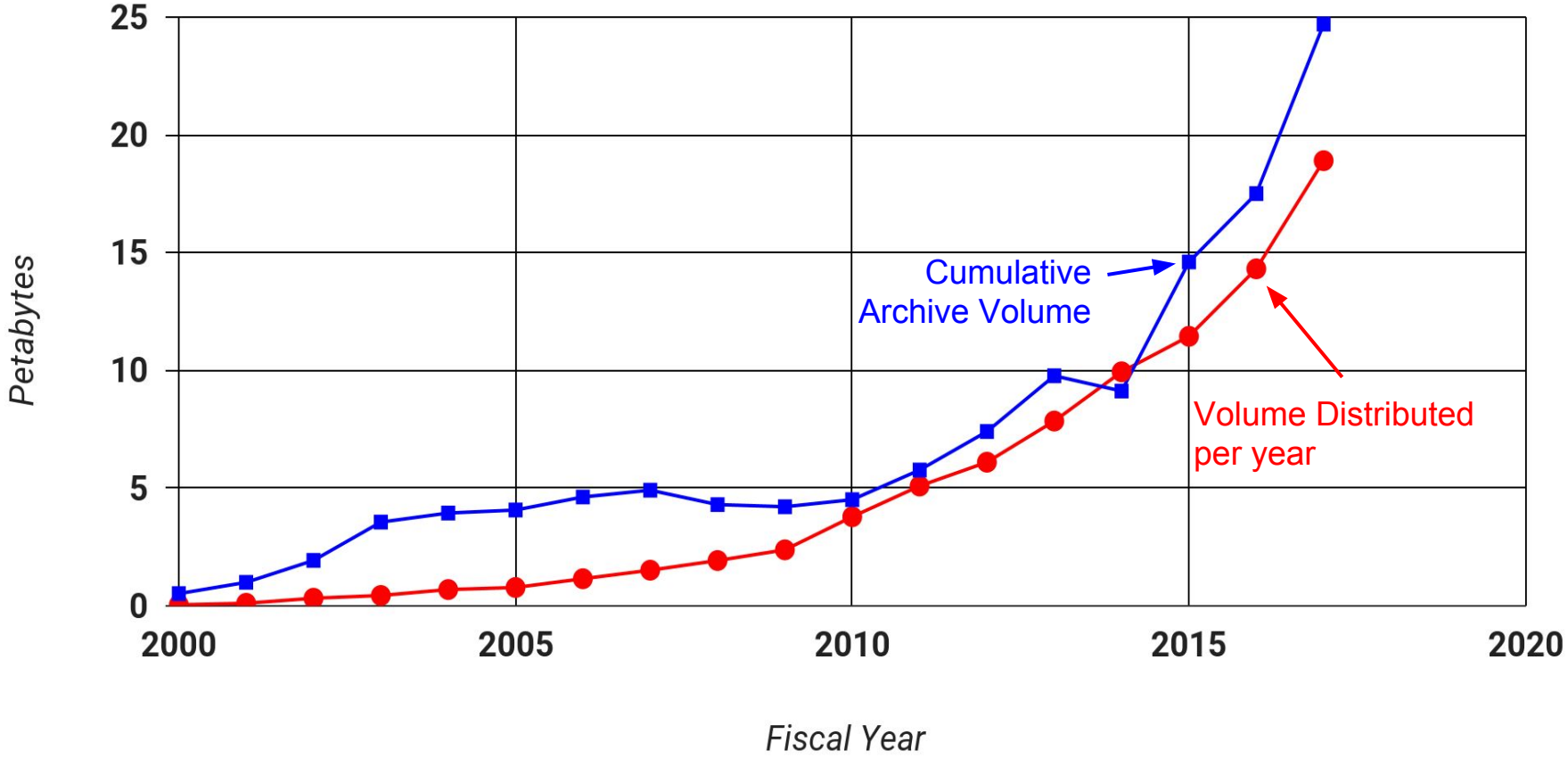
Automated Metrics

EOSDIS Metrics System (EMS)



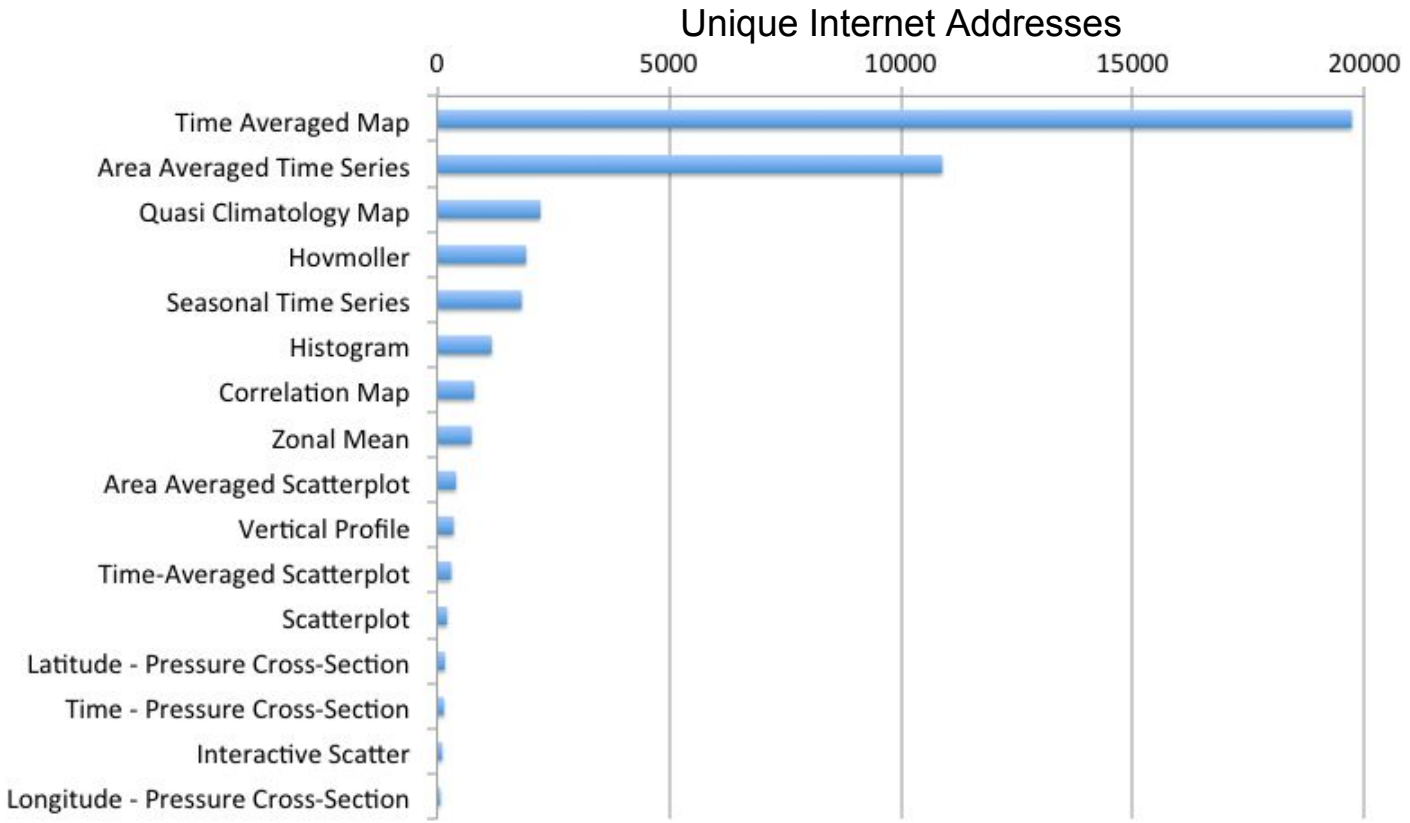
*HTTP = Hypertext Transport Protocol

Annual EOSDIS distribution is on the same order of magnitude as the total archive volume



Analysis of Giovanni Analytics Function Usage

March 2017 to
Feb. 2018

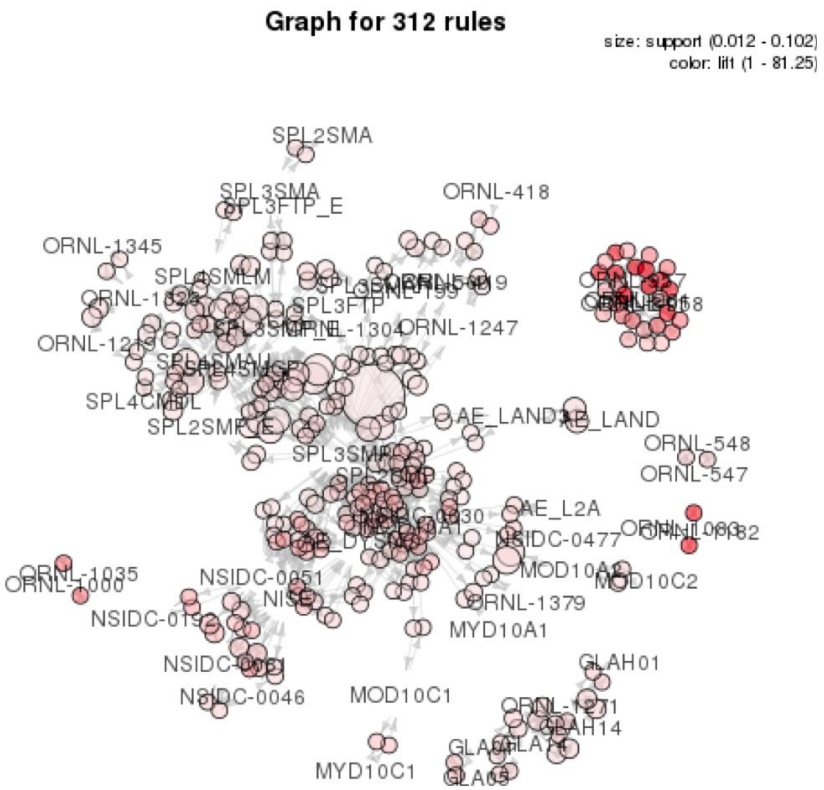


Market Basket Analysis with User Profiles

- Association Rule Learning finds associations between variables
- This is used by Amazon and others for recommendations
- Uses the number of times that two items are ordered together (placed in the same “market basket”)
- Pilot by Alison Boyer* for 2 DAACs over 2016-07-01 to 2017-06-30

*Chief Scientist at the Oak Ridge National Laboratory (ORNL) DAAC

Market Basket Analysis with User Profiles



Courtesy Alison Boyer, ORNL DAAC

Dataset associations from ORNL and National Snow and Ice Data Center DAACs:

- 325 users in common
- 312 association rules
- 27 rules across DAACs
  e.g.,

{ GLAS* LiDAR† Forest Canopy Height
GLAS/ICESat§ L1A Global Altimetry }

{ Global Soil/Regolith/Sediment Thickness
SMAP‡ Surface and Root Zone Soil Moisture }

*GLAS: Geoscience Laser Altimeter System

†LiDAR: Light Detection and Ranging

§ICESat: Ice, Clouds, and Land Elevation Satellite

‡SMAP: Soil Moisture Active-Passive

Still in search of...

Impact Metrics

- Papers written using dataset X
- Applications using dataset X