NASA Wildfire Review Meeting
Boulder Colorado

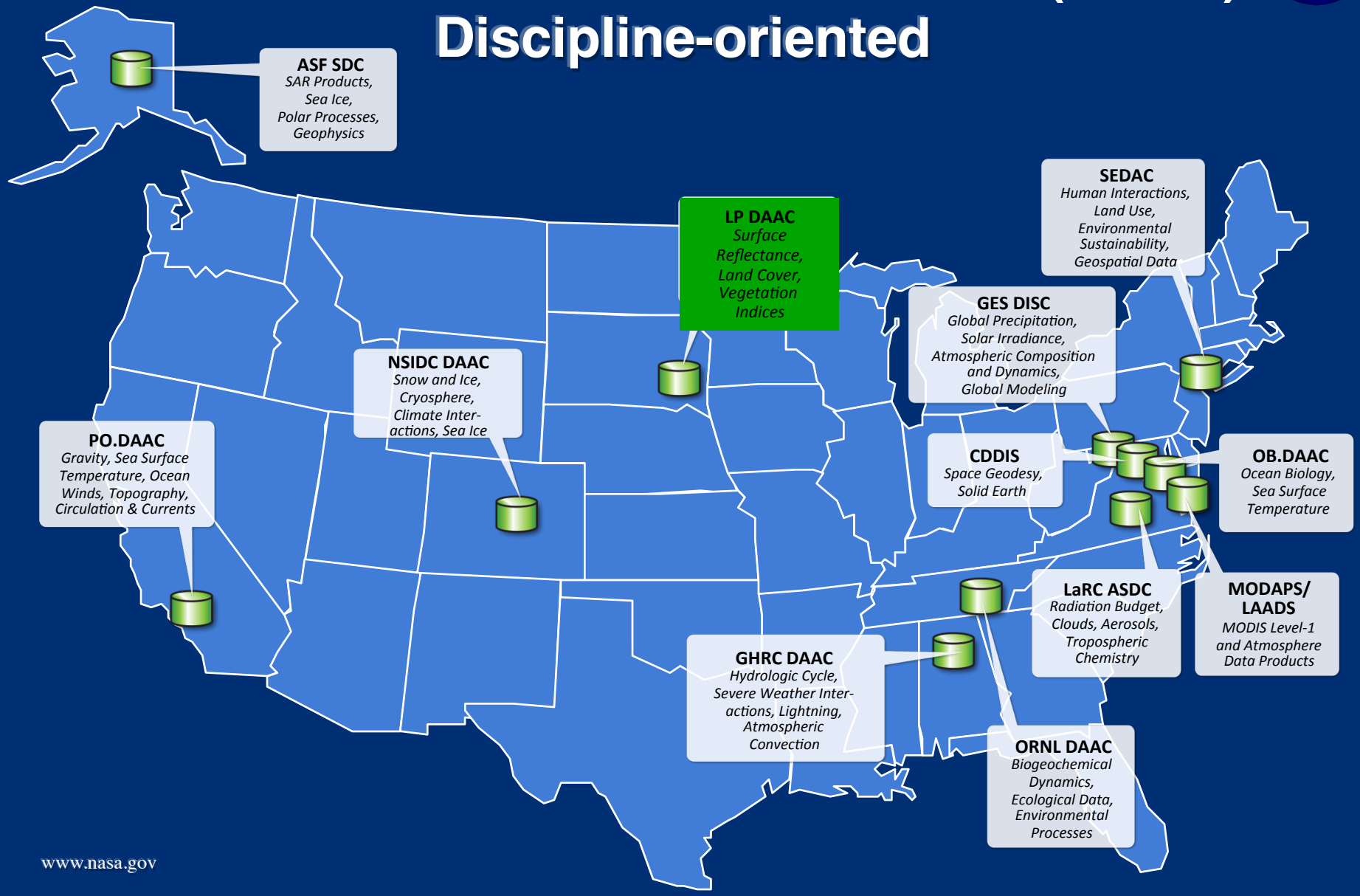
Land Processes Distributed Active Archive Center (LP DAAC)

Chris Doescher, PMP
LP DAAC Project Manager
cdoesch@usgs.gov
605-594-2649

Chris Torbert, PMP
LP DAAC Mission Manager
ctorbert@usgs.gov
605-594-2825

Tom Maiersperger
LP DAAC Scientist
tmaiersperger@usgs.gov
605-594-2853

Distributed Active Archive Centers (DAAC)
Discipline-oriented



NASA LP DAAC

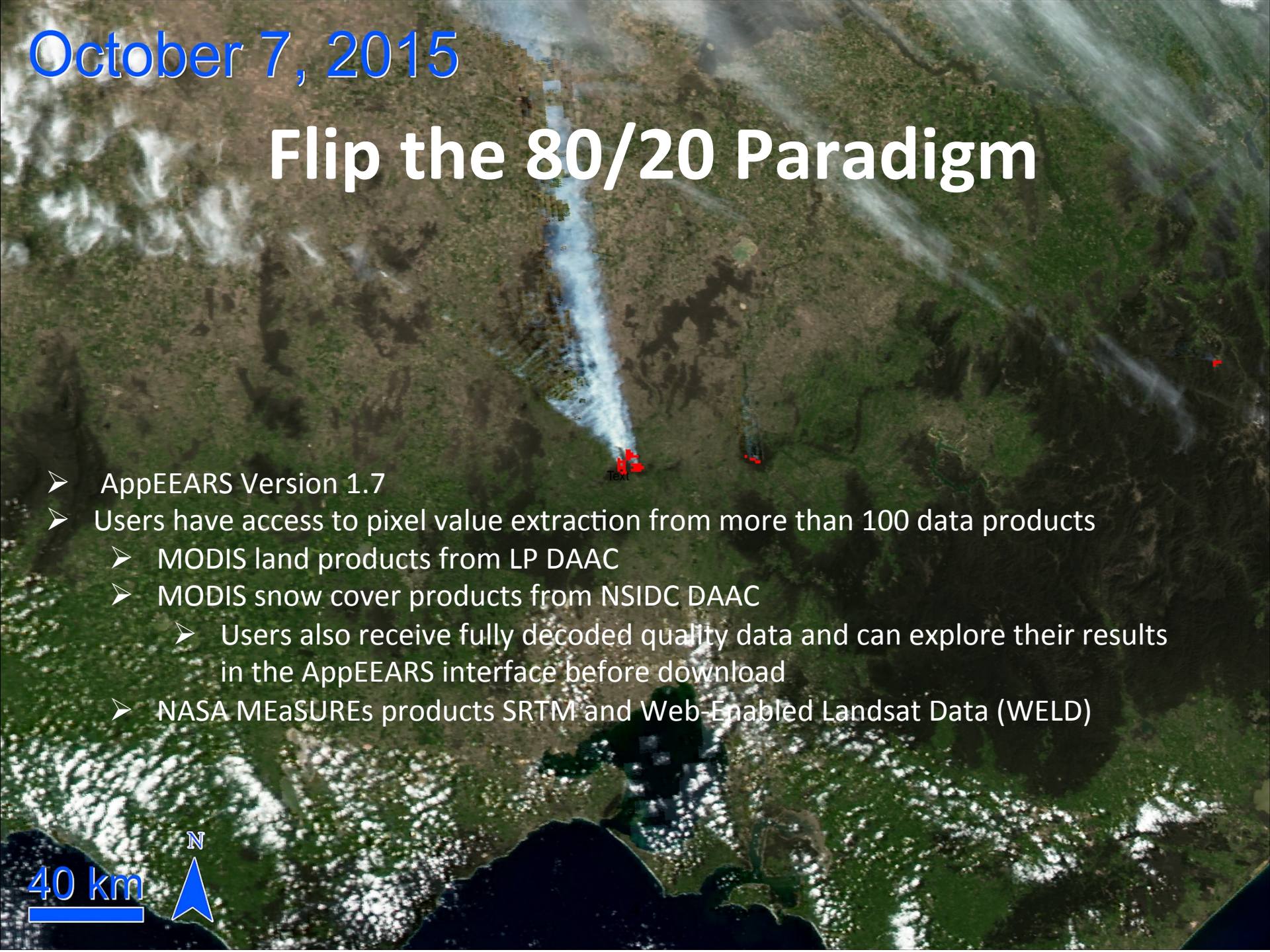
- Vision (objective) Statement – ingest, archive, process and distribute NASA Earth Science land products and information to NASA principal investigators and DoI land managers.
  - And 100,000's of other general users

- Mission (purpose) Statement - Archive land data products and information, develop new services on the data using accepted industry standards, and offer consistent levels of service through methods our users find convenient and efficient to enable the ability to conduct scientific and application research.

October 7, 2015

Flip the 80/20 Paradigm

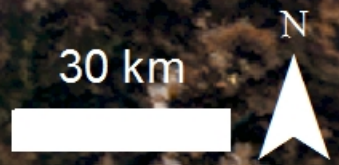
- AppEEARS Version 1.7
- Users have access to pixel value extraction from more than 100 data products
  - MODIS land products from LP DAAC
  - MODIS snow cover products from NSIDC DAAC
    - Users also receive fully decoded quality data and can explore their results in the AppEEARS interface before download
  - NASA MEaSUREs products SRTM and Web-Enabled Landsat Data (WELD)



October 17, 2016

Flip the 80/20 Paradigm

- Alpha Area Extraction - Released mid-December 2016
  - Invited users have access to the ability to simultaneously:
    - Extract time series of multiple geographic areas using a shapefile or geoJSON
    - Reproject to another spatial projection
    - Reformat to GeoTIFF
    - Receive per-pixel decoded data quality information
- Beta Area Extraction - will occur Q3 of FY2017
  - Silent public release to open access (volunteers?!?!)
  - Users will have all the alpha functions plus ISO standard metadata for samples

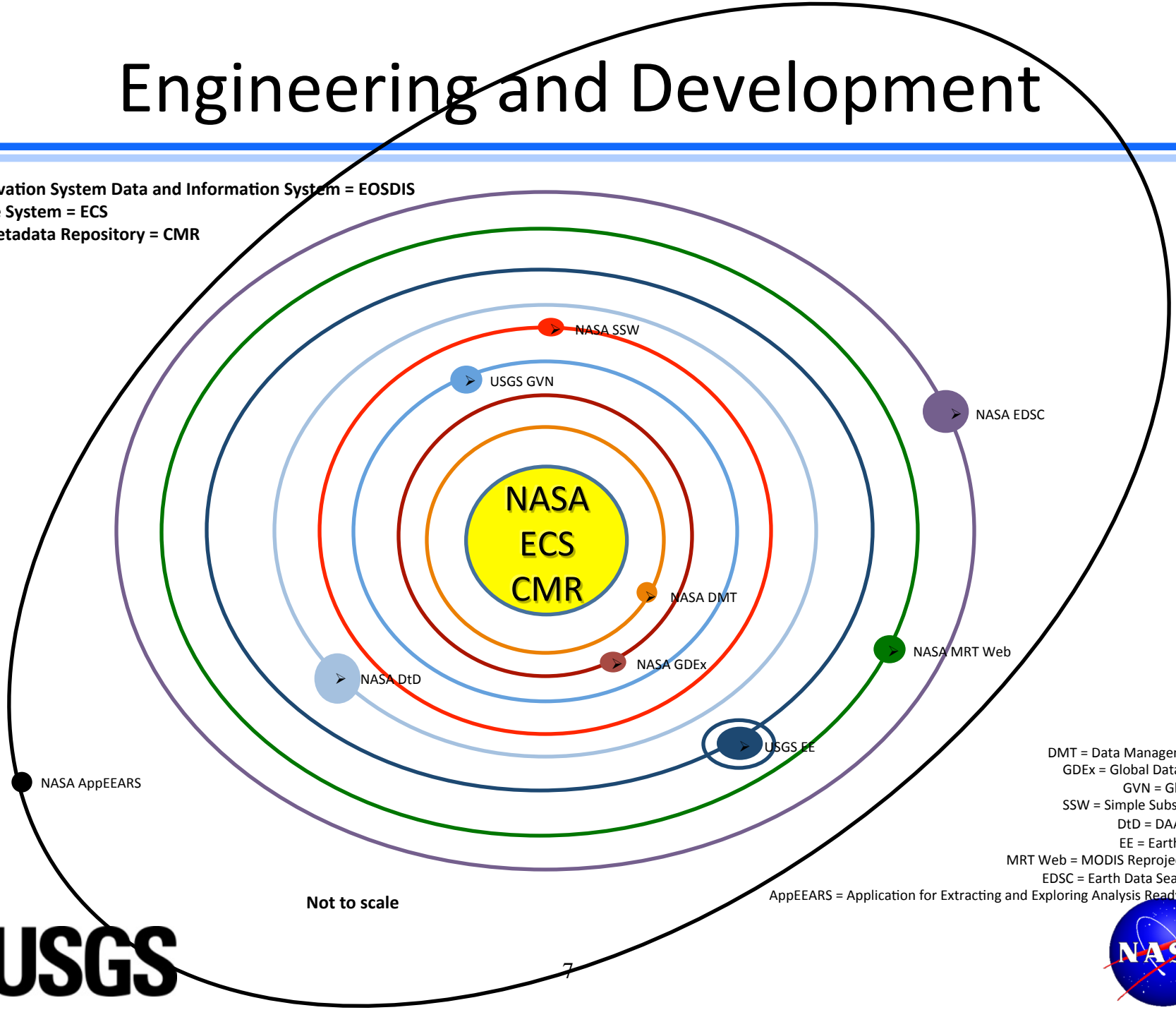


Flip the 80/20 Paradigm

- On-going development efforts
  - Addition of population count and population density data from SEDAC
  - Addition of Daymet data from ORNL DAAC
  - Addition of MODIS Tier 2 products (ET, MAIAC, LST&E, VCF) from LP DAAC
    - And V6 Monthly Burned Area product
  - Addition of NASA VIIRS data from LP DAAC
  - Addition of USGS Landsat tiled data
  - Updates to the User Interface and graph visualizations

Engineering and Development

Earth Observation System Data and Information System = EOSDIS
EOSDIS Core System = ECS
Common Metadata Repository = CMR



Not to scale

DMT = Data Management Tool
GDEx = Global Data Explorer
GVN = GloVis Next
SSW = Simple Subset Wizard
DtD = DAAC to Disk
EE = Earth Explorer
MRT Web = MODIS Reprojection Tool
EDSC = Earth Data Search Client
AppEEARS = Application for Extracting and Exploring Analysis Ready Samples

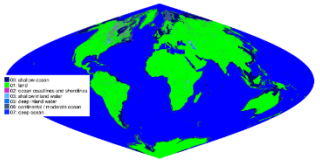
DoI/USGS Relationships

Background:
The National Satellite Land Remote Sensing Data Archive (NSLRSDA) resides at the U.S. Geological Survey's (USGS) Earth Resources Observation and Science (EROS) Center. Through the Land Remote Sensing Policy Act of 1992 (refer to *http://thomas.loc.gov/cgi-bin/query/ z?c102:H.R.6133.ENR:*), the U.S. Congress directed the Department of the Interior (DOI) to establish a permanent Government archive containing satellite remote sensing data of the Earth's land surface and to make the data easily accessible and readily available. This unique DOI/ USGS archive provides a comprehensive, permanent, and impartial observational record of the planet's land surface obtained throughout more than five decades of satellite remote sensing.

DoI has the same responsibility for Aerial Photography

Community Product Assessments (CPA)

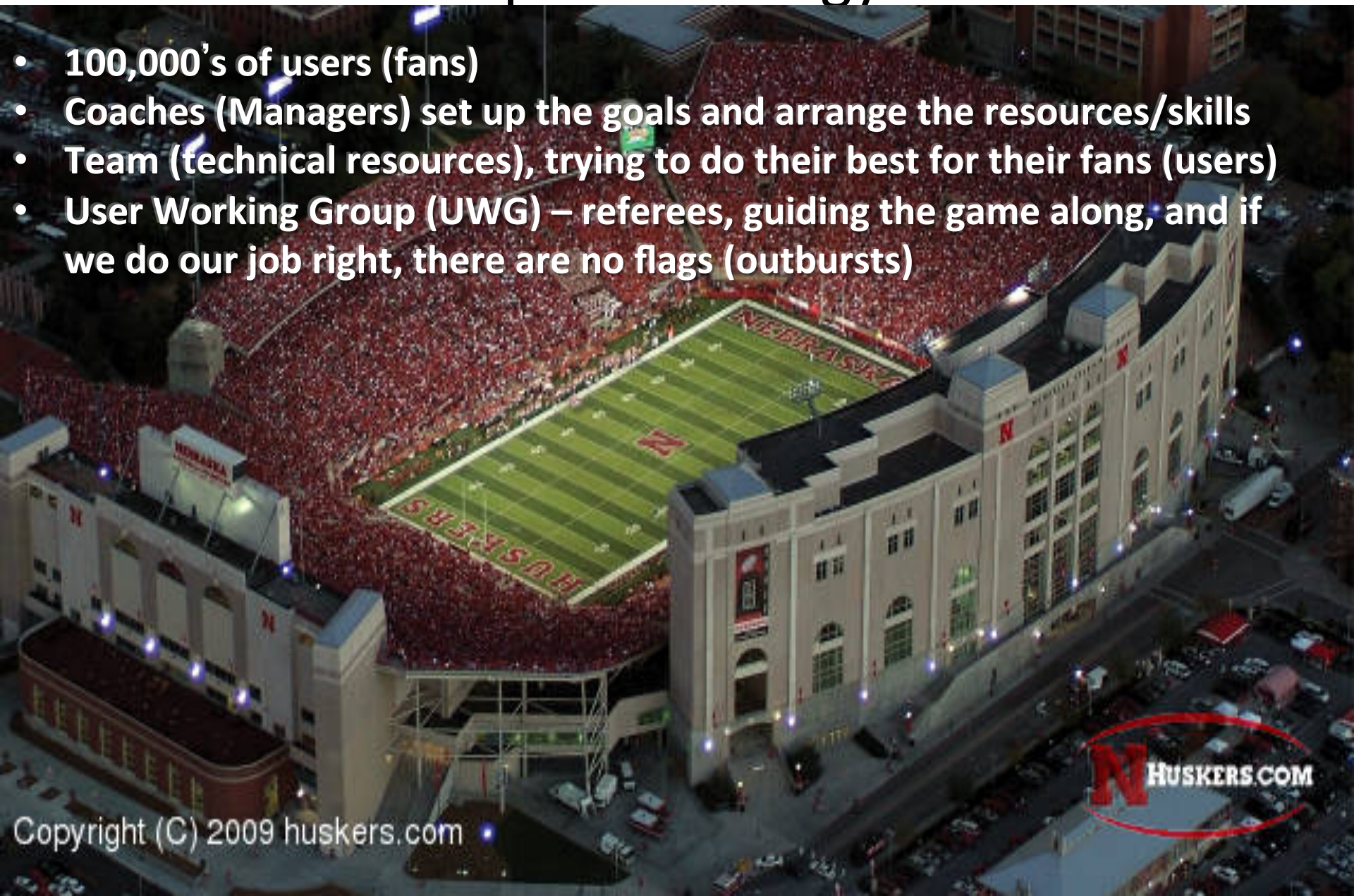
- TOPOFIRE
  - Z. Holden, NASA Applied Sciences
- Global Raster 250-meter Water Mask



  - M. Carroll, NASA Earth Science
- Goddard's LiDAR, Hyperspectral & Thermal Imager (G-LiHT)
  - B. Cook, Goddard IR&D, NASA Earth Science

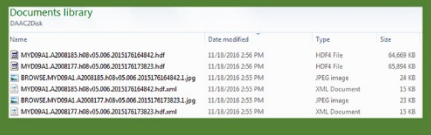
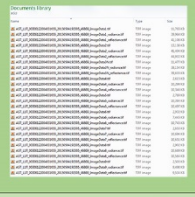
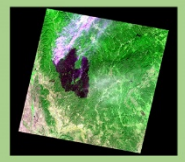
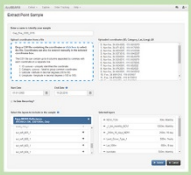
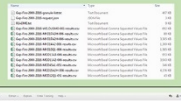
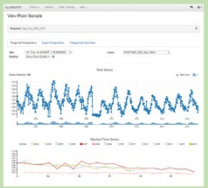
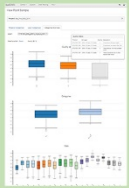
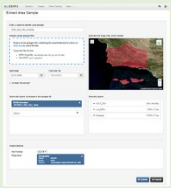
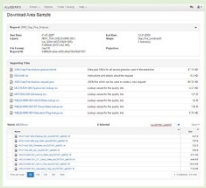
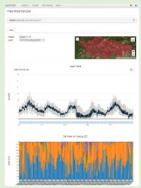
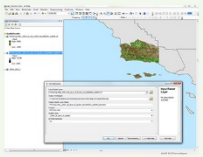
Sports Analogy

- 100,000's of users (fans)
- Coaches (Managers) set up the goals and arrange the resources/skills
- Team (technical resources), trying to do their best for their fans (users)
- User Working Group (UWG) – referees, guiding the game along, and if we do our job right, there are no flags (outbursts)



Tools and Services for Working with Multiple Land Remote Sensing Data Products

Cole Krehbiel[1], Aaron Friesz[1], Lindsey Harriman[2], Rob Quenzer[2], Kevin Impecoven[2], Thomas Maiersperger[3]
[1]Innovate!, Inc., contractor to the U.S. Geological Survey (USGS) Earth Resources Observation and Science (EROS) Center, Sioux Falls, SD. Work performed under USGS contract G15PC00012; [2]Stinger Ghaffarian Technologies, Inc. (SGT), contractor to the USGS EROS Center, Sioux Falls, SD. Work performed under USGS contract G15PC00012; [3]USGS EROS Center, Sioux Falls, SD.

Task	Tool	Function	Result
✓ Search and Download Land Processes Distributed Active Archive Center (LP DAAC) Data from Data Pool	DAAC2DISK is a download manager that provides immediate, direct access to NASA DAAC data holdings	Web-based Interface Command Line	
✓ Convert hierarchical data format (HDF) to GeoTIFF ✓ Calculate Top of Atmosphere (TOA) Reflectance from Digital Number (DN)	Python and R scripts to facilitate the use of Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) L1T data	Scripts take ASTER L1T files, output each science dataset (SDS) as GeoTIFF, and optionally converts Visible/Near Infrared (VNIR) and Shortwave Infrared (SWIR) data from DN to TOA Reflectance	 
✓ Extract 16 years of Moderate Resolution Imaging Spectroradiometer (MODIS) and Web-Enabled Landsat Data (WELD)	Application for Extracting and Exploring Analysis Ready Samples **Point**	 	 
✓ Extract, Clip, and Reproject 3 years of MODIS Data	Web application interface for accessing and extracting Land Remote Sensing data **Area**	 	
✓ Determine Quality of Data used to observe a Fire	ArcGIS Python Toolbox	 *Quality Decoder*	

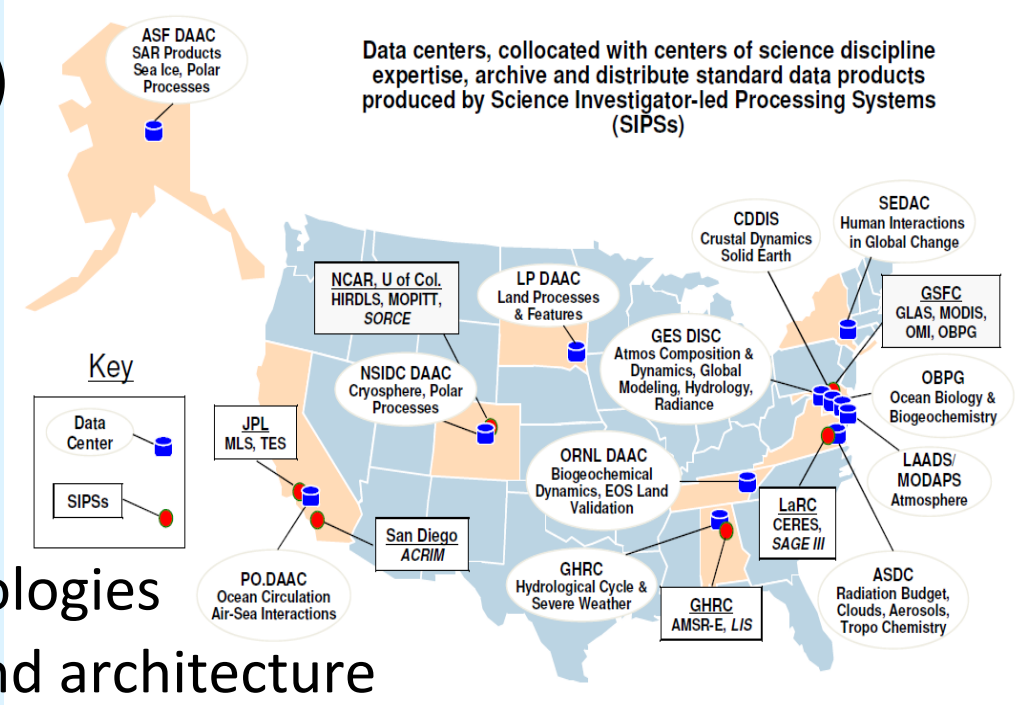
For access to these tools and more LP DAAC User Resources, including Publications, Outreach Materials, Data in Action Stories, and E-Learning Materials, visit https://lpdaac.usgs.gov/user_resources

https://lpdaac.usgs.gov/

U.S. Department of the Interior
U.S. Geological Survey

December 2016

Questions?

What is a DAAC?

- ✓ Access (search/sort)
- ✓ Customer Support (tiered)
- ✓ Distribution
- ✓ Standards
- ✓ Outreach
- ✓ Awareness
- ✓ Training
- ✓ Exploration of new technologies
  - ✓ Hardware, software and architecture
- ✓ Support Research and applied sciences
- ✓ Knowledge of imagery and meta data
- ✓ Supporting our SISTER DAAC's
- ✓ .....Archive