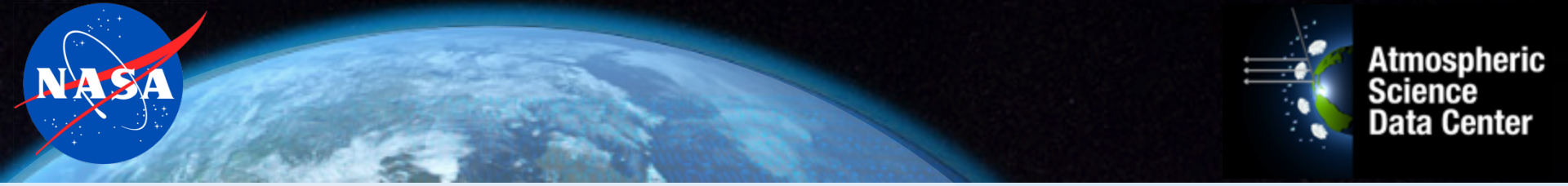
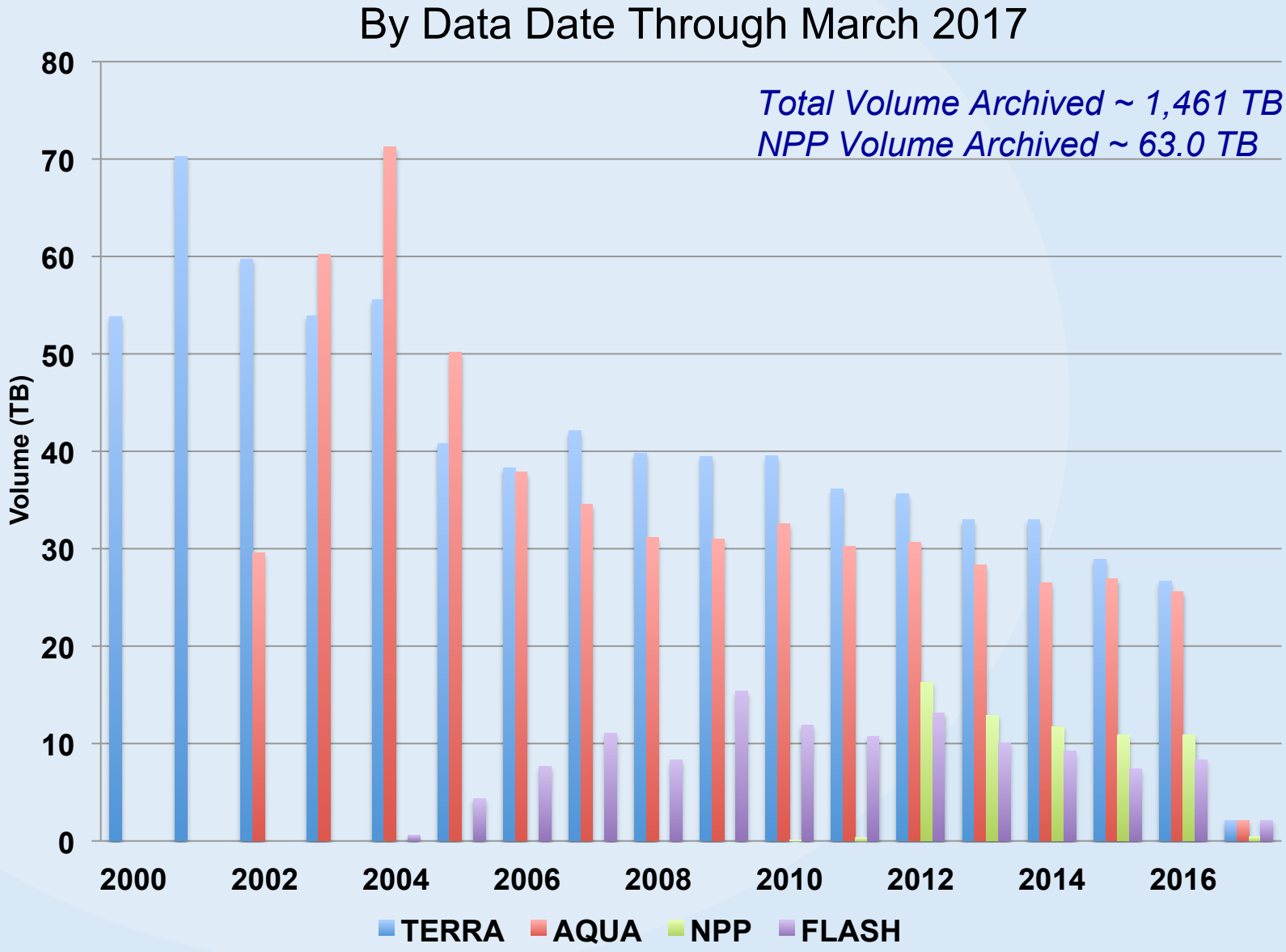


Atmospheric Science Data Center Update

CERES Science Team Meeting
May 16, 2017

CERES and FLASHFlux Archive Volume



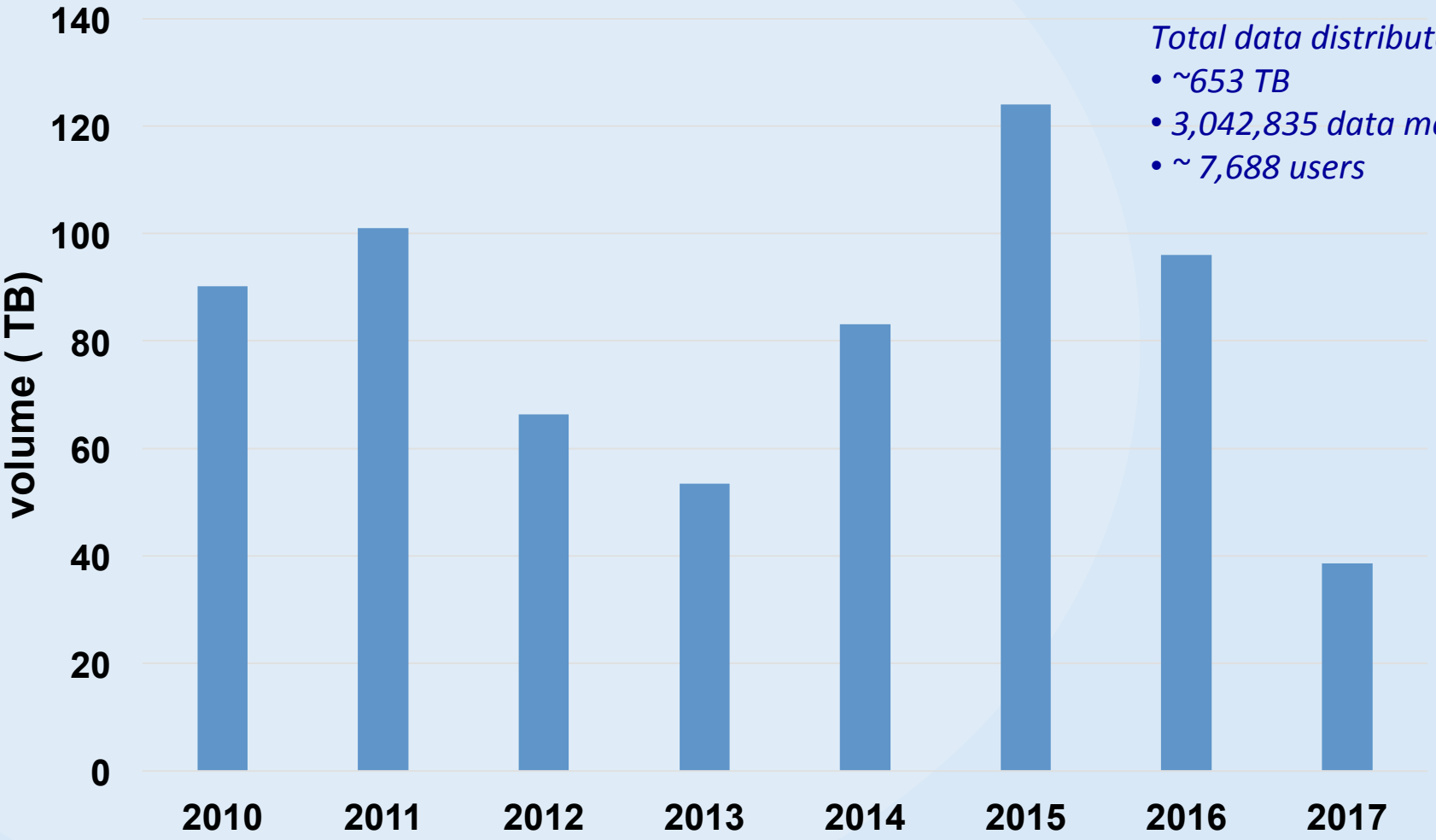
CERES Data Orders
(June 2010 – March 2017)

Atmospheric Science Data Center

Total Orders: 48,272

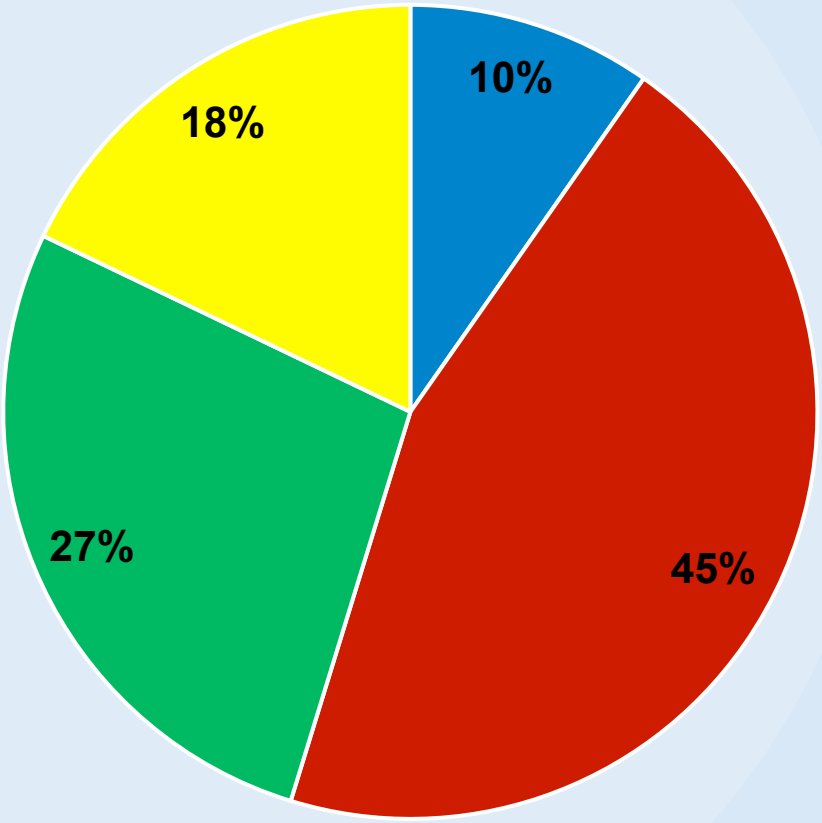
CERES Data Distribution
(June 2010 – March 2017)

Atmospheric Science Data Center



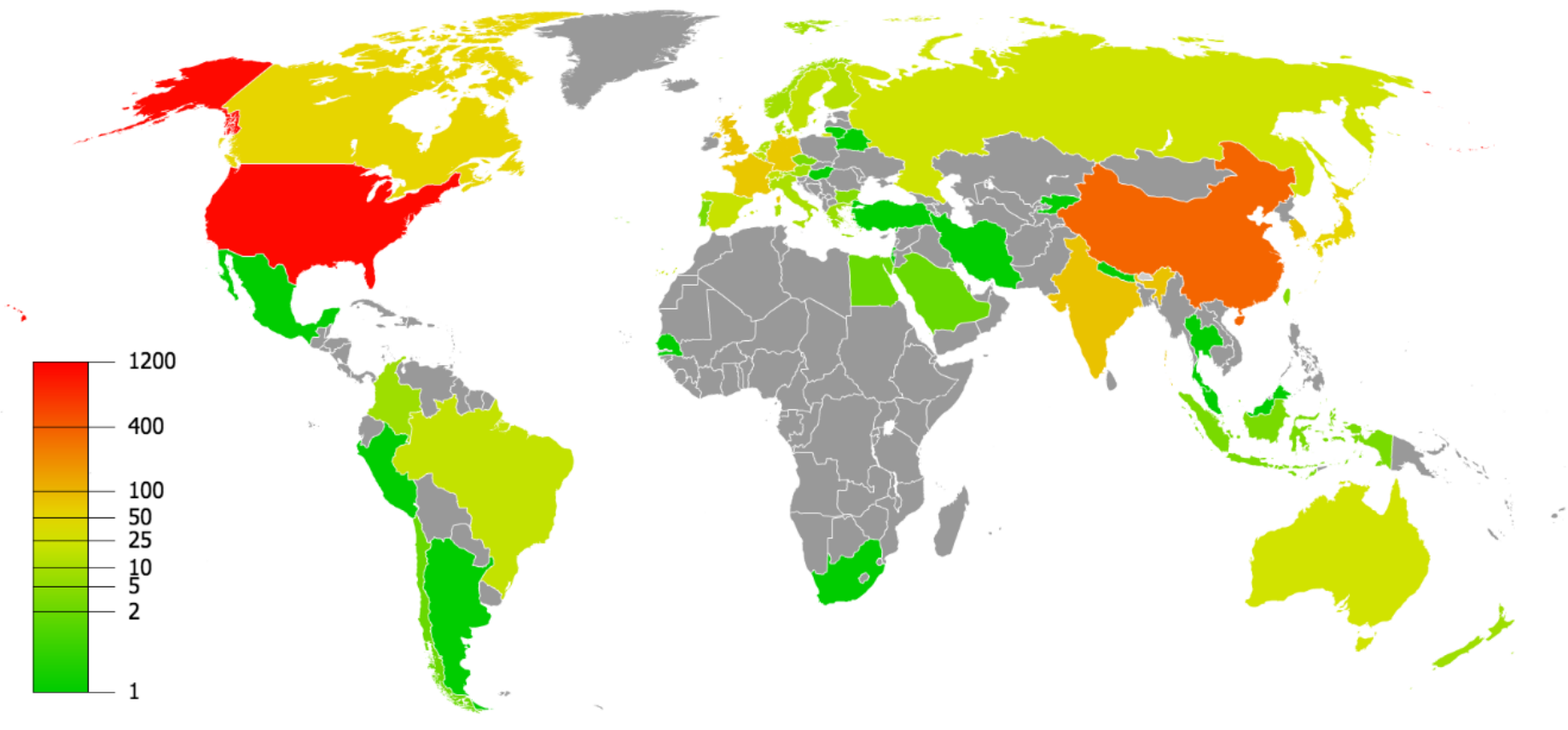
Total data distributed
- *~653 TB*
- *3,042,835 data months*
- *~ 7,688 users*

User Affiliations

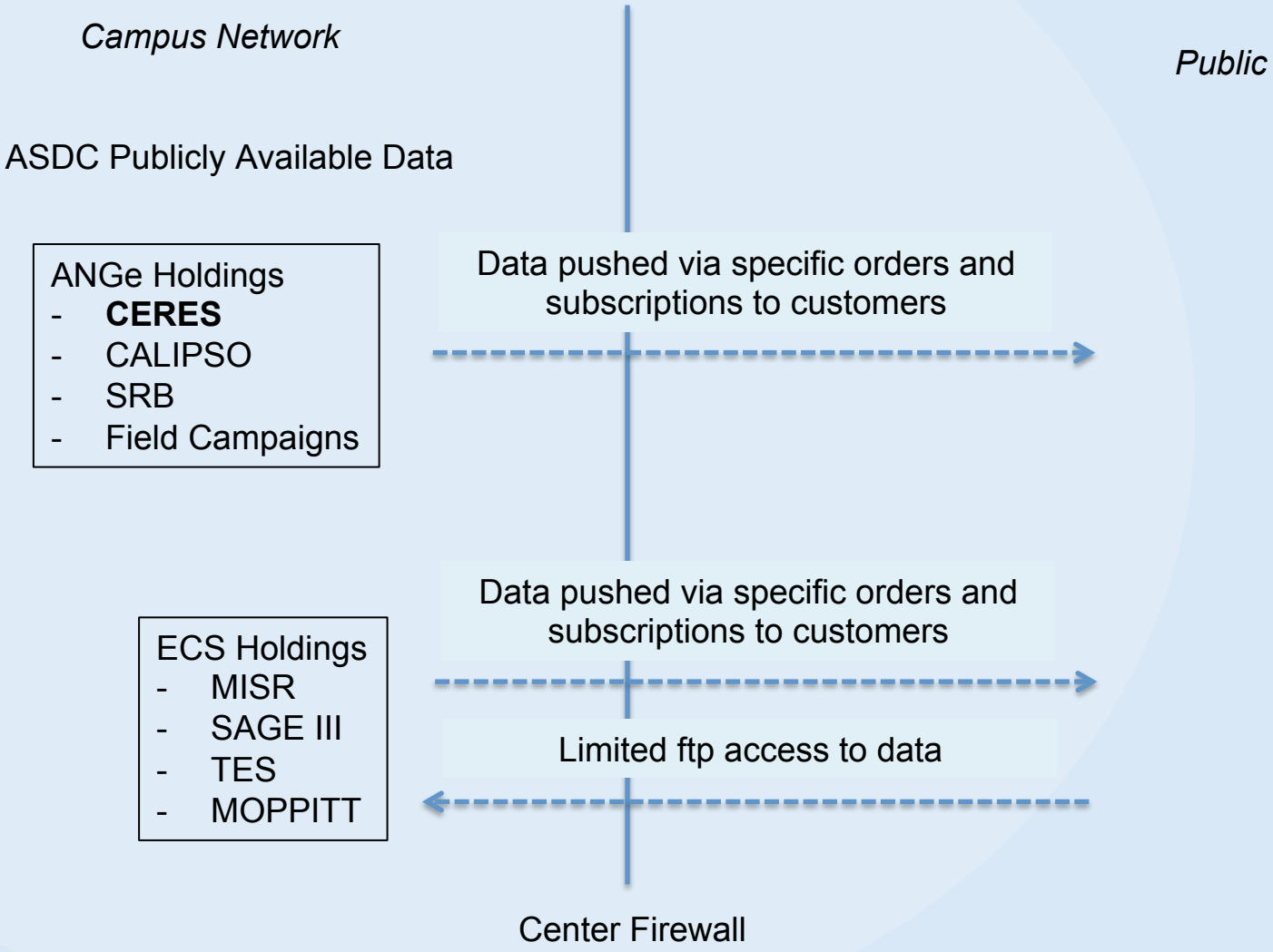


Users by Country
(June 2010 – March 2017)

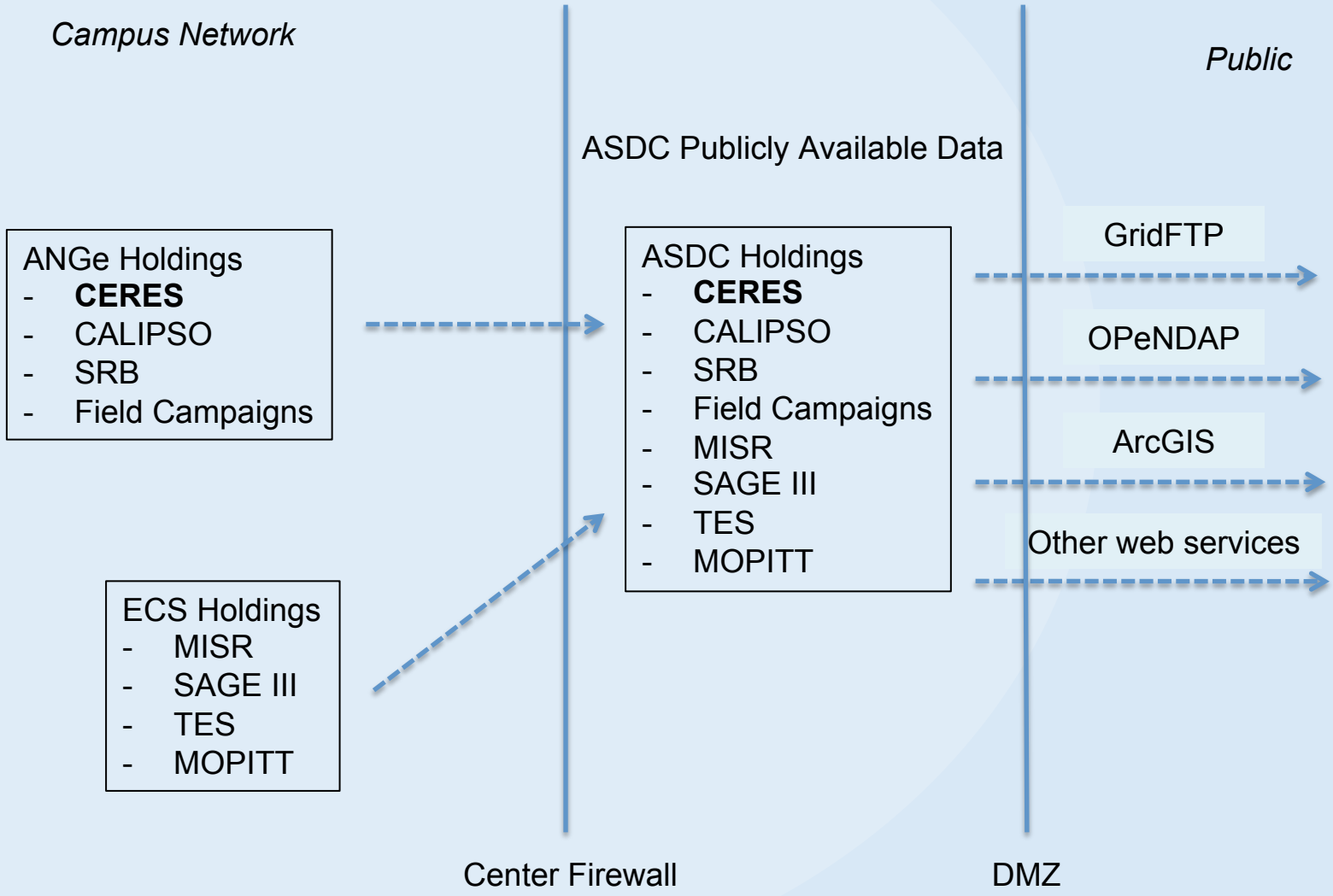
Atmospheric Science Data Center



Current Storage Configuration



Planned Storage Configuration



ASDC Cloud Pilot

Atmospheric Science Data Center

OpenStack:
- Open Source IaaS (Infrastructure as a Service)
  - Storage, Networking, & Compute resources
- Dense utilization of compute resources
- Potential for Hybrid Cloud

Current Status:
- DMZ deployment has been completed
- Hardening/testing of platform is ongoing

Upcoming work:
- Deployment of internal OpenStack
- Migration of compute workloads
- Integration with CloudForms

openstack™

amazon web services™

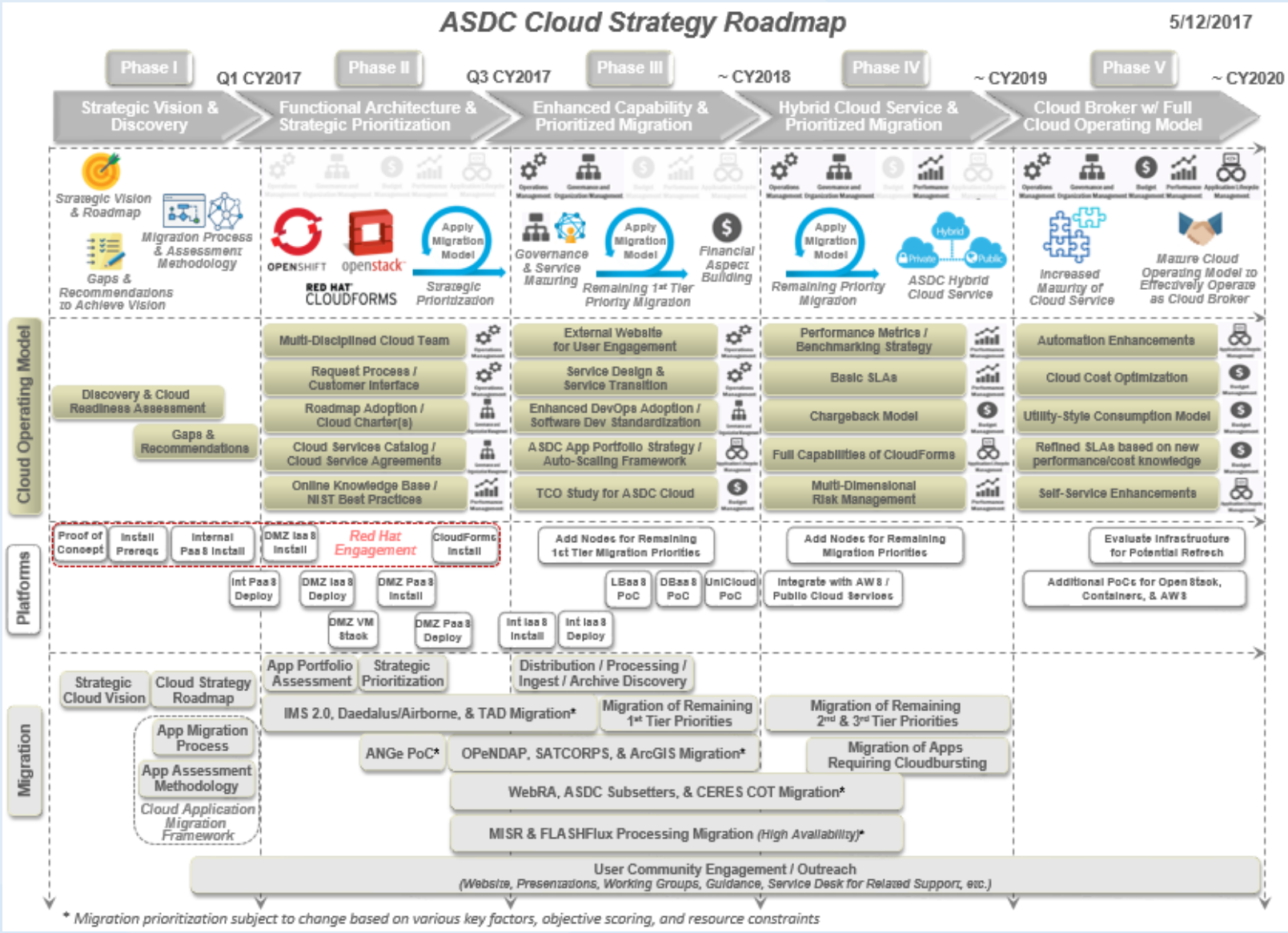
HPE Helion

ASDC Cloud Pilot

OpenShift:
- Open Source PaaS (Platform as a Service)
  - Built on Docker & Kubernetes
- Container based “microservices”
- Rapid Application Development
- Easy Application deployment & scaling

Current Status:
- Internal AMI dev/test & production are now live
- Dev sandbox is available

Upcoming work:
- Deployment to DMZ for external production
- Migration of WebRA applications
- Integration with CloudForms


ASDC Cloud Strategy Roadmap
5/12/2017
Phase I
Q1 CY2017
Phase II
Q3 CY2017
Phase III
~ CY2018
Phase IV
~ CY2019
Phase V
~ CY2020
Strategic Vision & Discovery
Functional Architecture & Strategic Prioritization
Enhanced Capability & Prioritized Migration
Hybrid Cloud Service & Prioritized Migration
Cloud Broker w/ Full Cloud Operating Model
Strategic Vision & Roadmap
Migration Process & Assessment Methodology
Gaps & Recommendations to Achieve Vision
OPENSHIFT
openstack
RED HAT CLOUDFORMS
Apply Migration Model
Strategic Prioritization
Governance & Service Maturing
Apply Migration Model
Remaining 1st Tier Priority Migration
Financial Aspect Building
Apply Migration Model
Remaining Priority Migration
Hybrid
Private
Public
ASDC Hybrid Cloud Service
Increased Maturity of Cloud Service
Mature Cloud Operating Model to Effectively Operate as Cloud Broker
Cloud Operating Model
Discovery & Cloud Readiness Assessment
Gaps & Recommendations
Multi-Disciplined Cloud Team
Request Process / Customer Interface
Roadmap Adoption / Cloud Charter(s)
Cloud Services Catalog / Cloud Service Agreements
Online Knowledge Base / NIST Best Practices
External Website for User Engagement
Service Design & Service Transition
Enhanced DevOps Adoption / Software Dev Standardization
ASDC App Portfolio Strategy / Auto-Scaling Framework
TCO Study for ASDC Cloud
Performance Metrics / Benchmarking Strategy
Basic SLAs
Chargeback Model
Full Capabilities of CloudForms
Multi-Dimensional Risk Management
Automation Enhancements
Cloud Cost Optimization
Utility-Style Consumption Model
Refined SLAs based on new performance/cost knowledge
Self-Service Enhancements
Platforms
Proof of Concept
Install Prereqs
Internal PaaS Install
DMZ IaaS Install
Red Hat Engagement
CloudForms Install
Int PaaS Deploy
DMZ IaaS Deploy
DMZ PaaS Install
DMZ VM Stack
DMZ PaaS Deploy
Add Nodes for Remaining 1st Tier Migration Priorities
LBaaS PoC
DBaaS PoC
UniCloud PoC
Int IaaS Install
Int IaaS Deploy
Add Nodes for Remaining Migration Priorities
Integrate with AWS / Public Cloud Services
Evaluate Infrastructure for Potential Refresh
Additional PoCs for OpenStack, Containers, & AWS
Migration
Strategic Cloud Vision
Cloud Strategy Roadmap
App Migration Process
App Assessment Methodology
Cloud Application Migration Framework
App Portfolio Assessment
Strategic Prioritization
Distribution / Processing / Ingest / Archive Discovery
IMS 2.0, Daedalus/Airborne, & TAD Migration*
Migration of Remaining 1st Tier Priorities
Migration of Remaining 2nd & 3rd Tier Priorities
ANGe PoC*
OPeNDAP, SATCORPS, & ArcGIS Migration*
Migration of Apps Requiring Cloudbursting
WebRA, ASDC Subsetters, & CERES COT Migration*
MISR & FLASHFlux Processing Migration (High Availability)*
User Community Engagement / Outreach
(Website, Presentations, Working Groups, Guidance, Service Desk for Related Support, etc.)
* Migration prioritization subject to change based on various key factors, objective scoring, and resource constraints