



Group on
Earth Observations

GEONETCast Americas - Status and Plans

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GEONETCast

What? A global near-real-time data dissemination system -- in support of the nine GEO societal benefit areas -- by which environmental observations, products, and services are transmitted to users through geostationary comms satellites

Why? To provide diverse environmental information to users 24x7x365 who might not otherwise have access to it

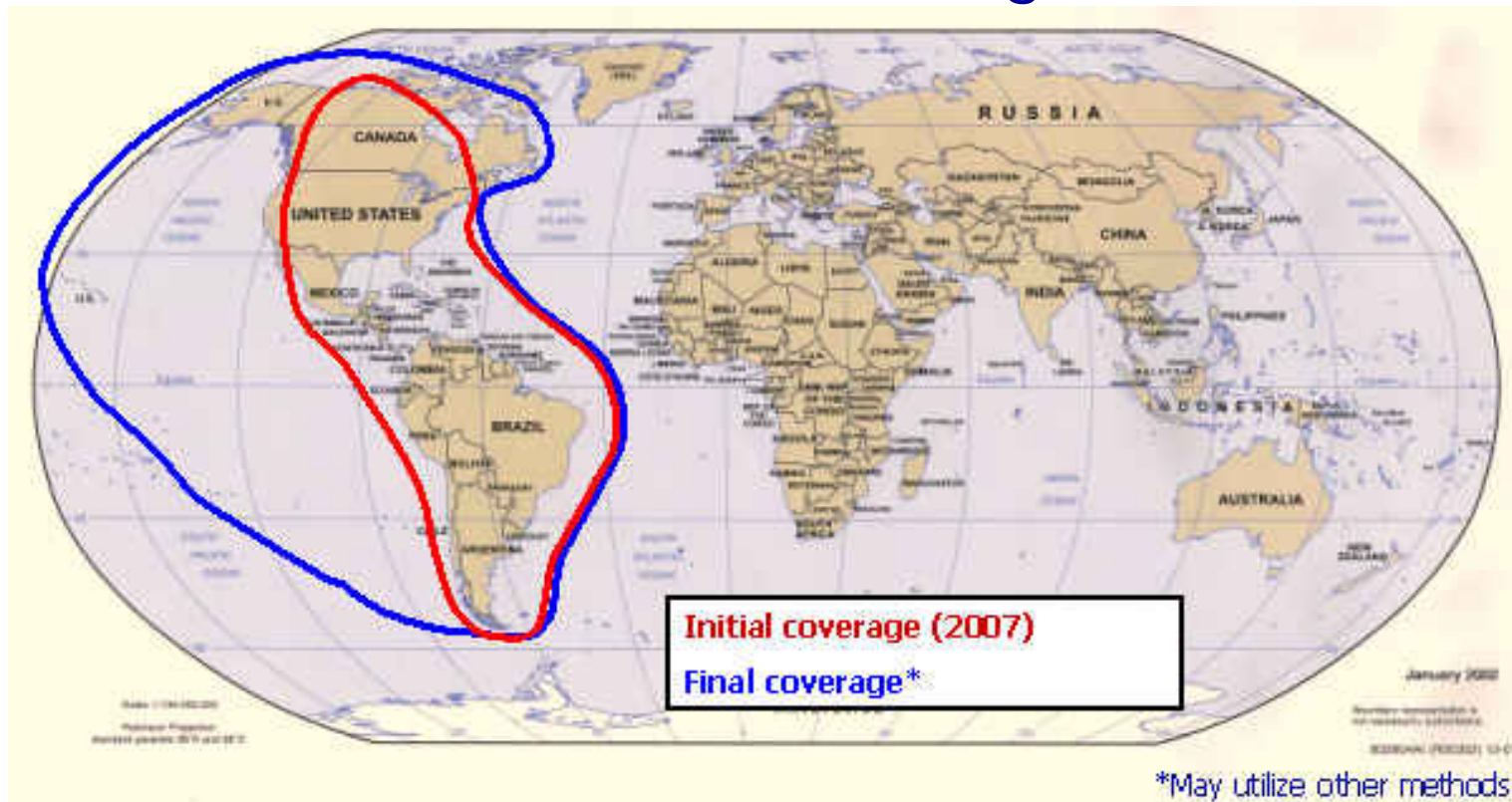
Who? EUMETSAT, Chinese Met. Administration, and NOAA will be regional infrastructure providers (others welcome)

When? Target is to demonstrate an initial global capability by the Earth Observation Summit-IV, November 30, 2007

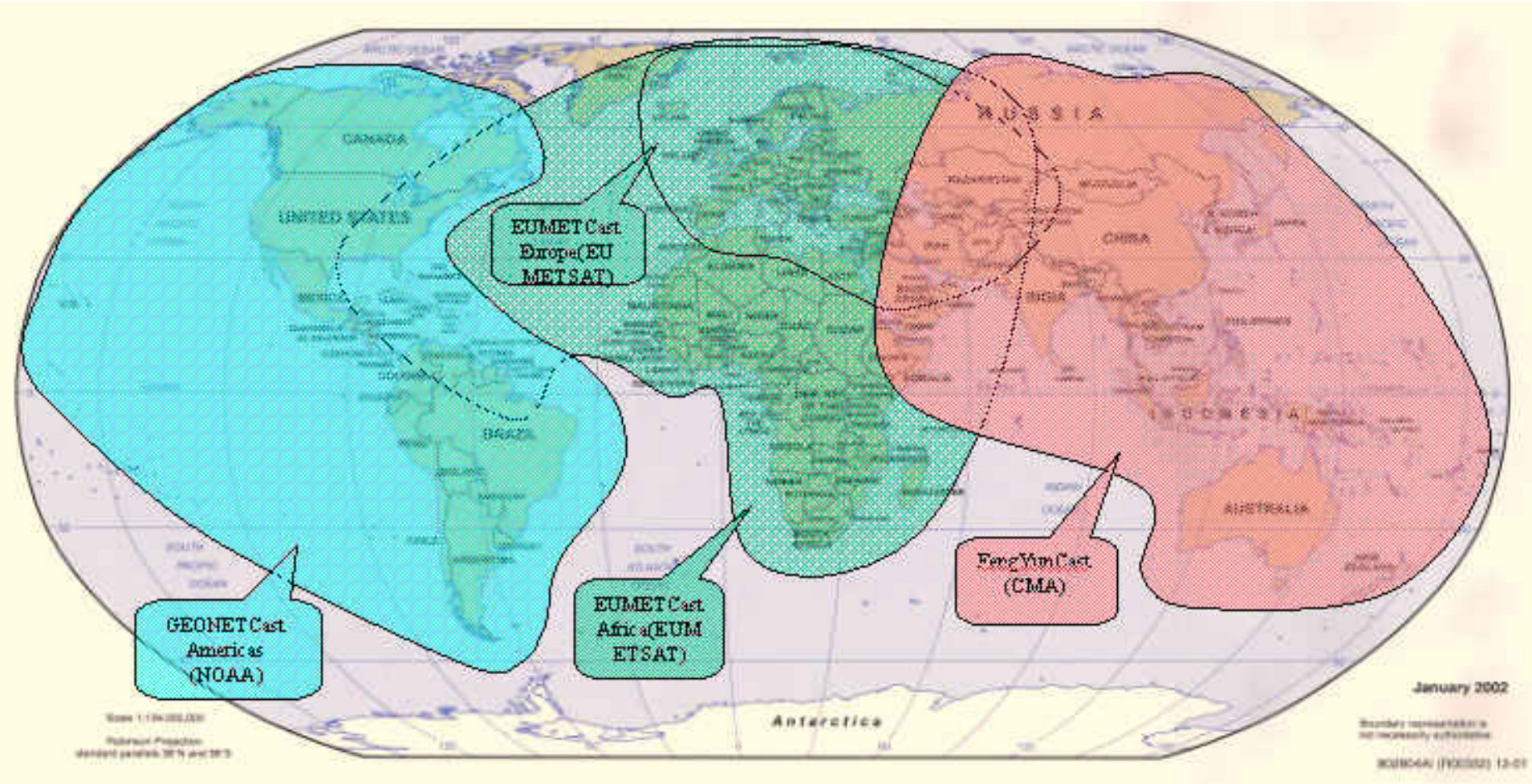
Where? See next two slides....

GEONETCast Americas

is the regional component of GEONETCast, provided by the U.S./NOAA, covering North, Central, and South Americas and surrounding ocean areas



Notional Global GEONETCast Coverage





GEONETCast Americas NOAA's 2007 Objective

- Implement an initial operational capability serving most of North, Central, and South America as soon as possible
- Introduce and demonstrate it internationally at the 4th Earth Observation Summit in Cape Town, South Africa in late November 2007
- Currently in process of reviewing vendor proposals and acquiring a commercial satellite data dissemination service
 - Expecting contract award in August and service initiation in early November





Initial Operational Capability

- Will use commercial Digital Video Broadcast for Satellites (DVB-S or DVB-S2) to broadcast file-based products
 - Used by commercial satellite television broadcast
- C-band or K-band broadcast frequencies (commercial DVB standards)
- Data throughput
 - 2 Megabits/sec initially; options to expand to 10 Megabits/sec depending on demand
- Spatial coverage
 - Most of North, Central, and South Americas (see previous map outline)
 - Option to expand to cover central and eastern Pacific Ocean and Alaska region
- 24x7x365 operational service availability
 - 99.5% availability; option for 99.9%

Global Earth Observation System of Systems (GEOSS)



Notional Dissemination Component of the GEOSS Data Management System of Systems

GEONETCast is one component

Data Dissemination Systems

Gov't
Sats.

Commercial
Sats.

Internet

Dedicated
Land Lines

Direct Broadcast

High Volume Users

GEONETCast

Sentinel-
Asia

SERVIR

EUMETCast

NOAA's
system

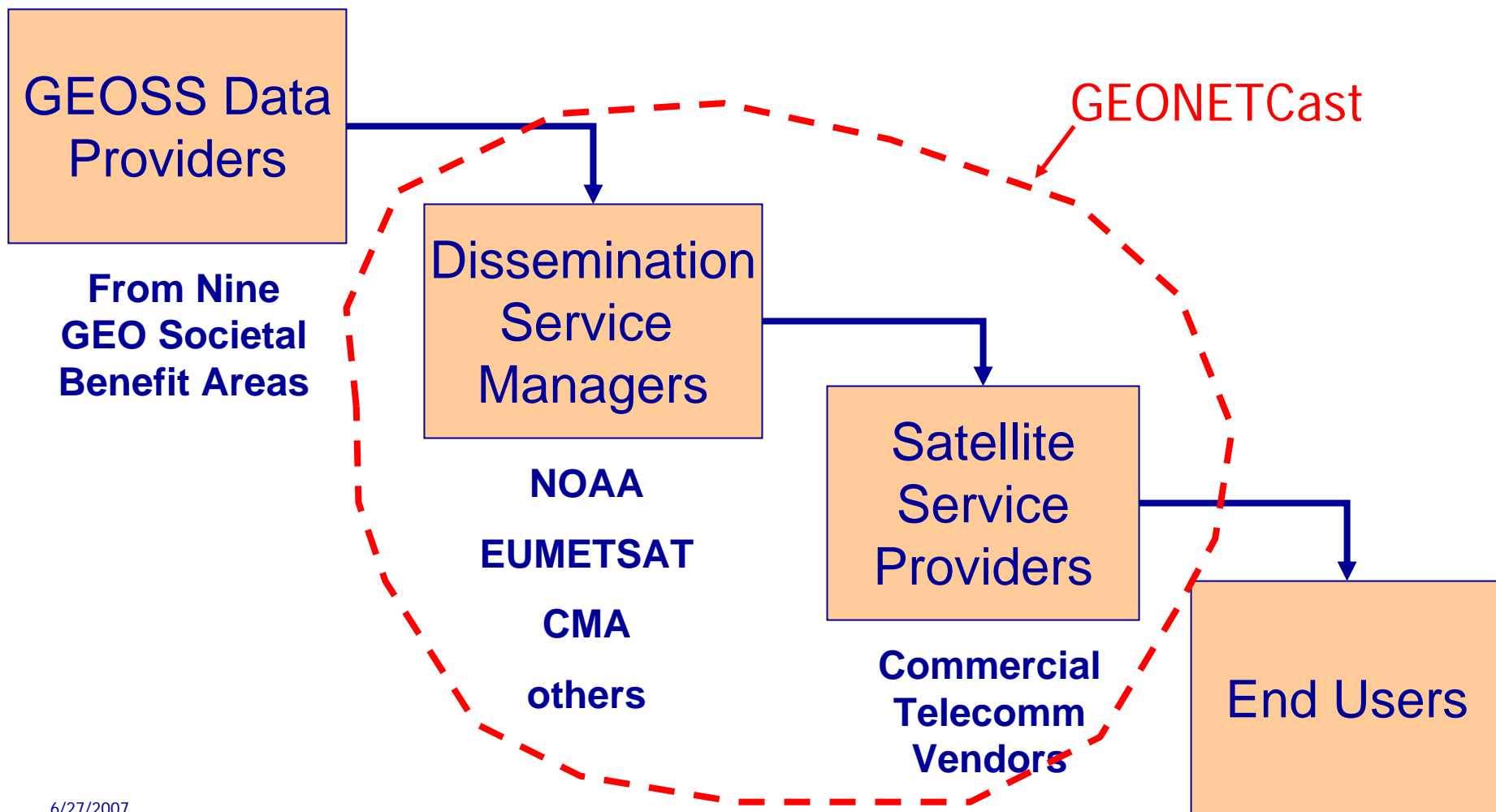
FengyunCast

Others

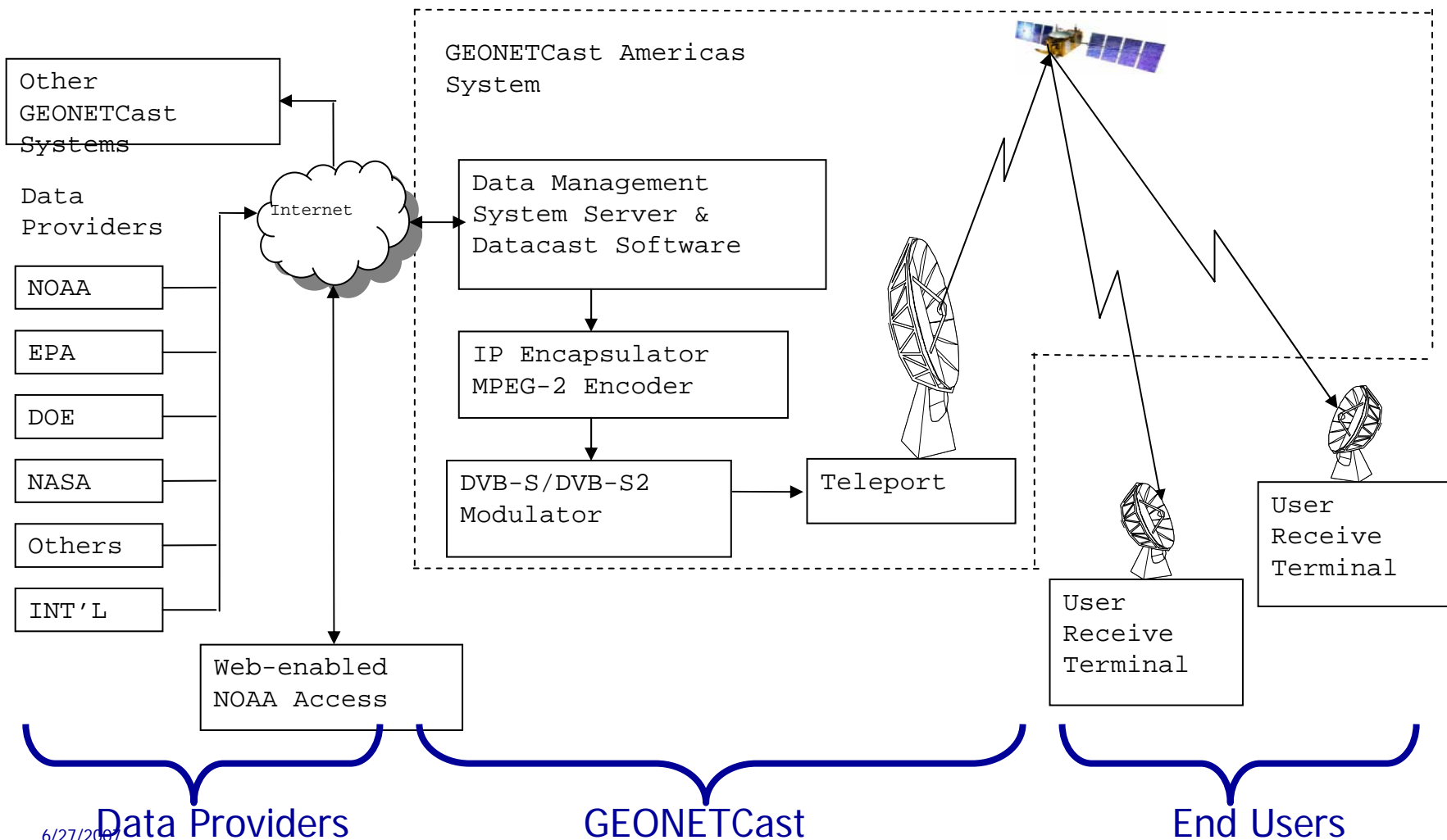
9 GEO Societal Benefit Areas

Major Global Participants

Connecting Data Providers to Data Users via Satellite



GEONETCast Americas System Architecture



GEONETCast Receive Station

- Dedicated personal computer
- Satellite antenna dish ~1.8-2.4m
- DVB receiver card or box





GEONETCast Americas Receive Station

- Users are responsible for purchase and operation of their station, including hardware and software
- Components will be standard commercial off-the-shelf components to keep user costs low
- Estimated costs
 - Personal computer - ~\$500
 - 2.4m antenna including LNB - \$1000-2000
 - DVB-S/S2 receiver - \$100-300
 - Antenna installation costs will vary
 - Client datacasting software for the PC - ~\$50-100 one-time, possible nominal recurring licensing costs



GEONETCast Americas Receive Station (cont.)

- Technical specifications for hardware & software will be published by NOAA via a public web page after GEONETCast Americas service contract is awarded
- Recommend that personal computer be dedicated to GEONETCast data reception, and data processing be done on separate computer

Potential GEONETCast End Users - *Anyone Who Needs Access to Environmental Information*

- Federal, state, & local environmental agencies
- Commercial industry, engineering consultants
- Universities, academia
- Public safety decision makers
- Citizens
- Many others





Current NOAA Activities

- **Engaging potential data providers** in the Americas to add products for broadcast before November's service kick-off
 - RANET, SERVIR in Central and South America
 - INPE Brazil
 - U.S. EPA, DOE, NASA, USGS
 - Others in Americas are encouraged to contact me
- **Engaging potential users** in the Americas regarding their product requirements for dissemination
- Preparing for GEONETCast demonstrations
 - ISRSE Costa Rica GEONETCast Workshop, June 27
 - 4th Earth Observation Summit, November 28-30

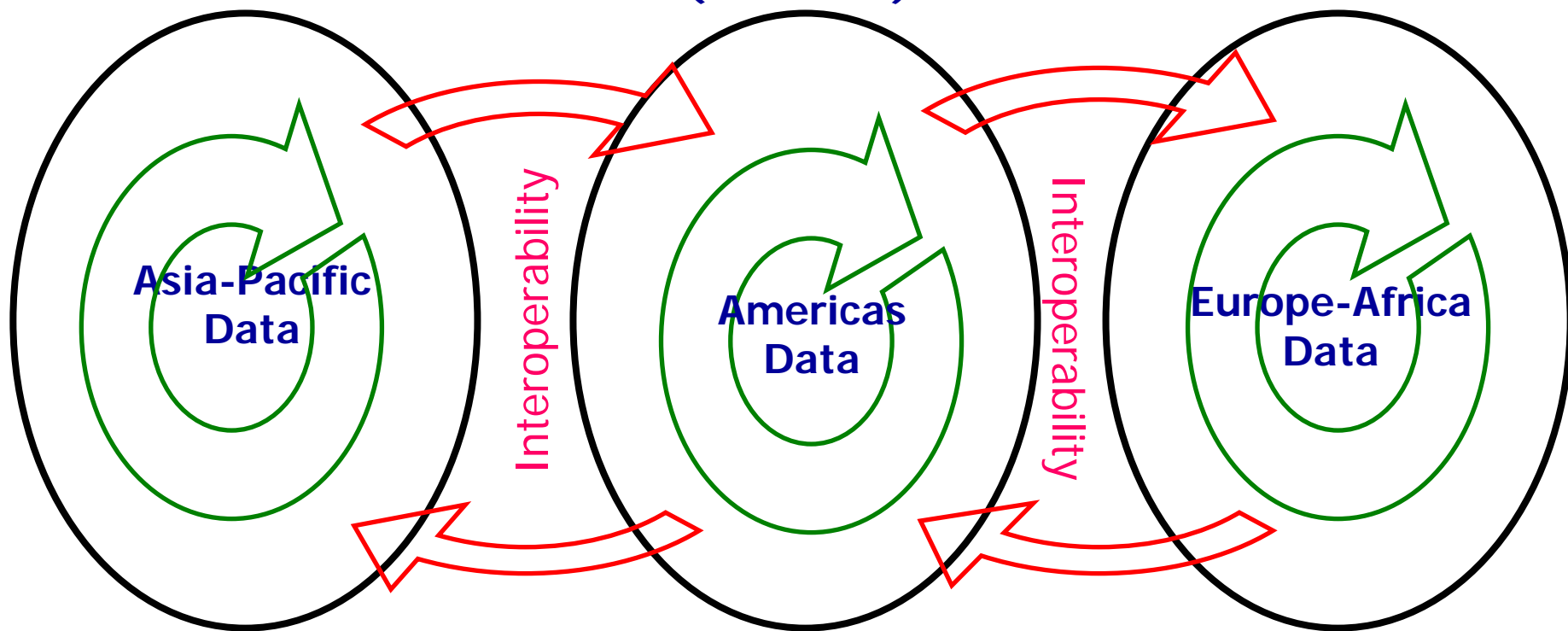
GEONETCast Global Data Exchange

Within & Across Regional Boundaries

FengyunCast
(Asia-Pacific)

GEONETCast
Americas
(Americas)

EUMETCast
(Europe-Africa)





GEONETCast Regional Interoperability

- Interoperability between regional systems will be implemented through data exchange agreements among EUMETSAT, CMA, & NOAA
- Environmental data in the Americas will be passed from GEONETCast Americas to EUMETCast and FengYunCast for broadcast; similarly their data will be received and broadcast in the Americas
 - This is the key interface between otherwise loosely coupled systems
- Technical approaches for exchanging data between regional systems include:
 - 1) Point-to-point terrestrial communication lines (e.g., secure FTP)
 - 2) Satellite turnaround and rebroadcast if overlapping satellite footprints are available
 - The actual implemented bilateral approach will be transparent to the user
- Hardware and software specifications for each regional GEONETCast receive station may be different but are fundamentally similar

GEONETCast Americas (GNC-A) Data Flow To and From the Americas

Products
from the
Americas



GNC-A Satellite(s)

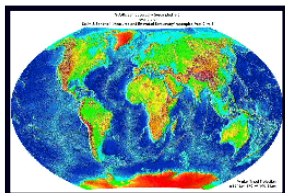


Other Satellites



Terrestrial SFTP

Products
from the
World



Approach #2

GNC-A Network
Center



End Users
in the
Americas



Other Global
Uplinks



Other
Global End
Users



Terrestrial SFTP (Approach #1)

Interoperability Interfaces



GEONETCast Data Product Information

- Product broadcast channels
 - Separate broadcast channels based on overarching product categories, e.g., GEO societal benefit area or other themes
 - Users can choose channels they wish to receive
 - An announcement channel will broadcast administrative messages
- Product formats
 - There is no restriction on the format of products contributed for broadcast as long as they are file-based
 - Can be a variety of formats (ASCII, JPEG, GIF, HDF5, BUFR, NetCDF, GRIB2, others)
 - Data providers are responsible for providing data users with any software needed to decode/view/use their products



GEONETCast Data Product Information (cont.)

- Product discovery
 - Catalog of available products and their associated metadata will be distributed via satellite and published on GEONETCast web sites
- Access control of GEONETCast Americas data
 - If required by particular data providers' policies, access control of their data products (e.g., through encryption) will be the responsibility of those data providers working directly with end users needing that data



Sample of Proposed GEONETCast Americas Products

- Brazil National Institute for Space Research (INPE)
 - Derived regional products including fire monitoring, lightning, rainfall nowcasting, UV Index, vegetation (examples shown)
- Central America/NASA SERVIR
 - Working to get products flowing soon, including MODIS fire images over Guatemala, and short-term rainfall forecasts from WRF and MM5 models (examples shown)
- U.S. Environmental Protection Agency
 - Hourly animated air quality maps of ozone and particulates over U.S.
- U.S. Department of Energy
 - Atmospheric water profiles and aerosol cloud condensation nuclei over Atmospheric Radiation Measurement (ARM) experimental sites
- U.S. NOAA
 - 17 products currently being disseminated including
 - Global Vegetation Index
 - Global total precipitable water
 - Chlorophyll concentration over the Caribbean Sea
 - Global soil moisture
 - Planned RANET Latin American regional products (USAID & NOAA)



Sample of EUMETSAT and CMA GEONETCast Products

- EUMETSAT

- Cloud Mask – full disk
- Global Instability Index – full disk
- Atmospheric Motion Vectors – full disk
- Surface Wind Vectors - global
- Cloud Analysis – full disk
- Meteosat SEVIRI images, 12 channels – full disk (examples shown)
- MODIS Ocean Data-Chlorophyll Alfa – global

- CMA

- Meteorological satellite images over Asia (examples shown)





GEONETCast Implementation Group Requests Your Assistance...

- To **identify potential end users** in the Americas and beyond who need access to environmental data
- To **identify potential data providers** in the Americas and beyond who have data that can satisfy those needs

How To Respond?

- Send NOAA* or EUMETSAT or CMA (depending on your location)...
 - Completed standard GEONETCast forms defining information on products you wish to contribute
 - Completed standard GEONETCast forms defining information on products you wish to use

GEONETCast Feedback Form Data Providers

Instructions: Please specify only one product type per form.

Project	
Point of Contact and Affiliation/Organization	
Address	
City, State, Zip code	
Country	
Email address	
Description of the product/data/service	
File size (kBytes) of the product/data/service	
Generation frequency of product/data/service	
Coverage area of the product/data/service	
Format/filetype of the product/data/service	
Preferred network connectivity to the GEONETCast uplink	Internet GTS VPN Other
User Station Processing Requirements (see footnote 1)	
Other important requirements	
What GEO Societal Benefit Areas are relevant?	Health Energy Disaster Mitigation Biodiversity Ecosystems Agriculture Weather Water Climate
Expected/typical users of this data/service	



GEONETCast Feedback Form

End Users

Project	
Point of Contact	
Address	
City	
Zip	
Country	
Email	
Expected product/data/service description	
Expected product/data/service source	
Expected product/data/service generation frequency	
Product coverage area	
Expected product/data/service format/filetype	
Other important requirements	



Summary

- NOAA is committed to provide a regional initial operational capability over the Americas for GEONETCast data dissemination with potential for expansion
- Our fall target launch date will enable an international announcement of the new America's service at the Earth Observation Summit-IV in South Africa in late November 2007
- We look forward to partnering with you to provide the new GEONETCast Americas as a service to global environmental information users and decision makers



GEO's GEONETCast Web Page

- <http://www.earthobservations.org/progress/GEONETCast.html>