



Group on
Earth Observations

GEONETCast Americas

*An Operational Service Delivering Environmental
Information using Communications Satellites*

Richard Fulton, Linda Moodie, and Paul Seymour
Satellite and Information Service (NESDIS)
National Oceanic and Atmospheric Administration (NOAA)
Silver Spring, Maryland, USA
Richard.Fulton@noaa.gov

CRSS/ASPRS 2007 Specialty Conference
Ottawa, Canada
31 October 2007





GEONETCast*

What is it? GEONETCast is a *global, near-real-time, data broadcast system of regional systems* -- in support of the GEO societal benefit areas -- by which environmental observations, products, and services are transmitted directly to users through satellites

It is one component of the overall GEOSS architecture.

Why? To enable improved decision-making through enhanced global environmental data dissemination

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

By Whom?



CMA



WMO



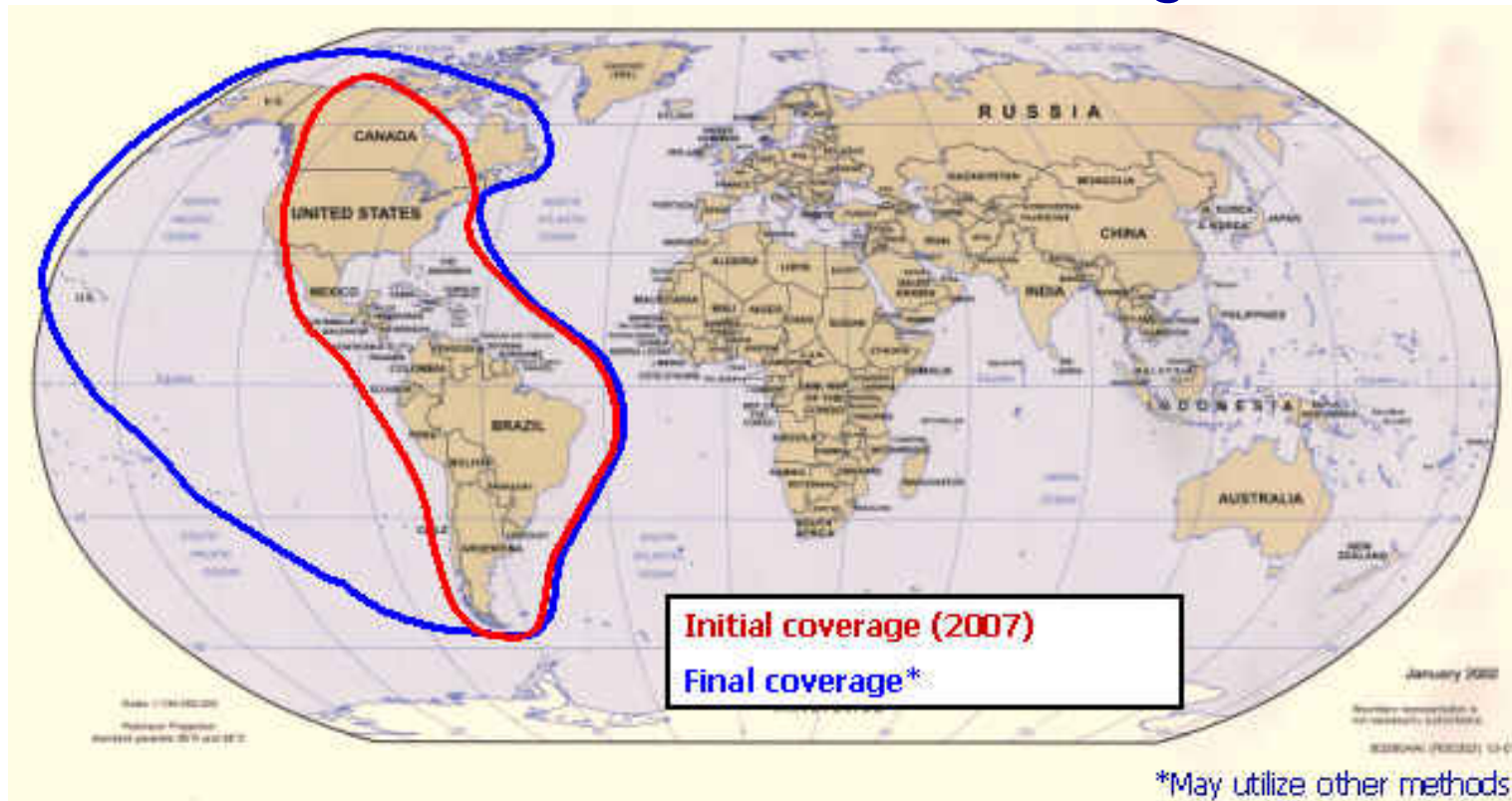
NOAA



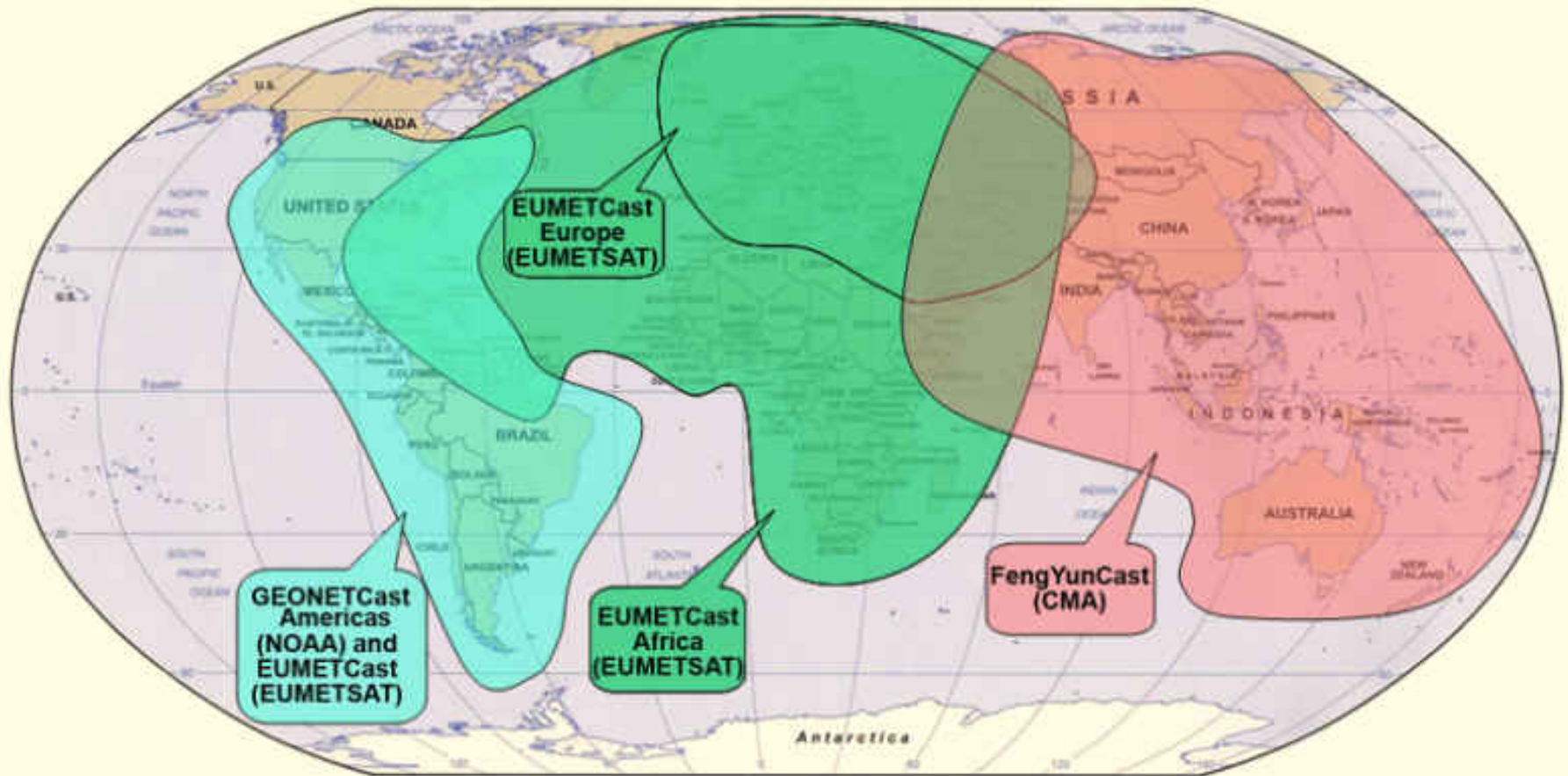
EUMETSAT

GEONETCast Americas

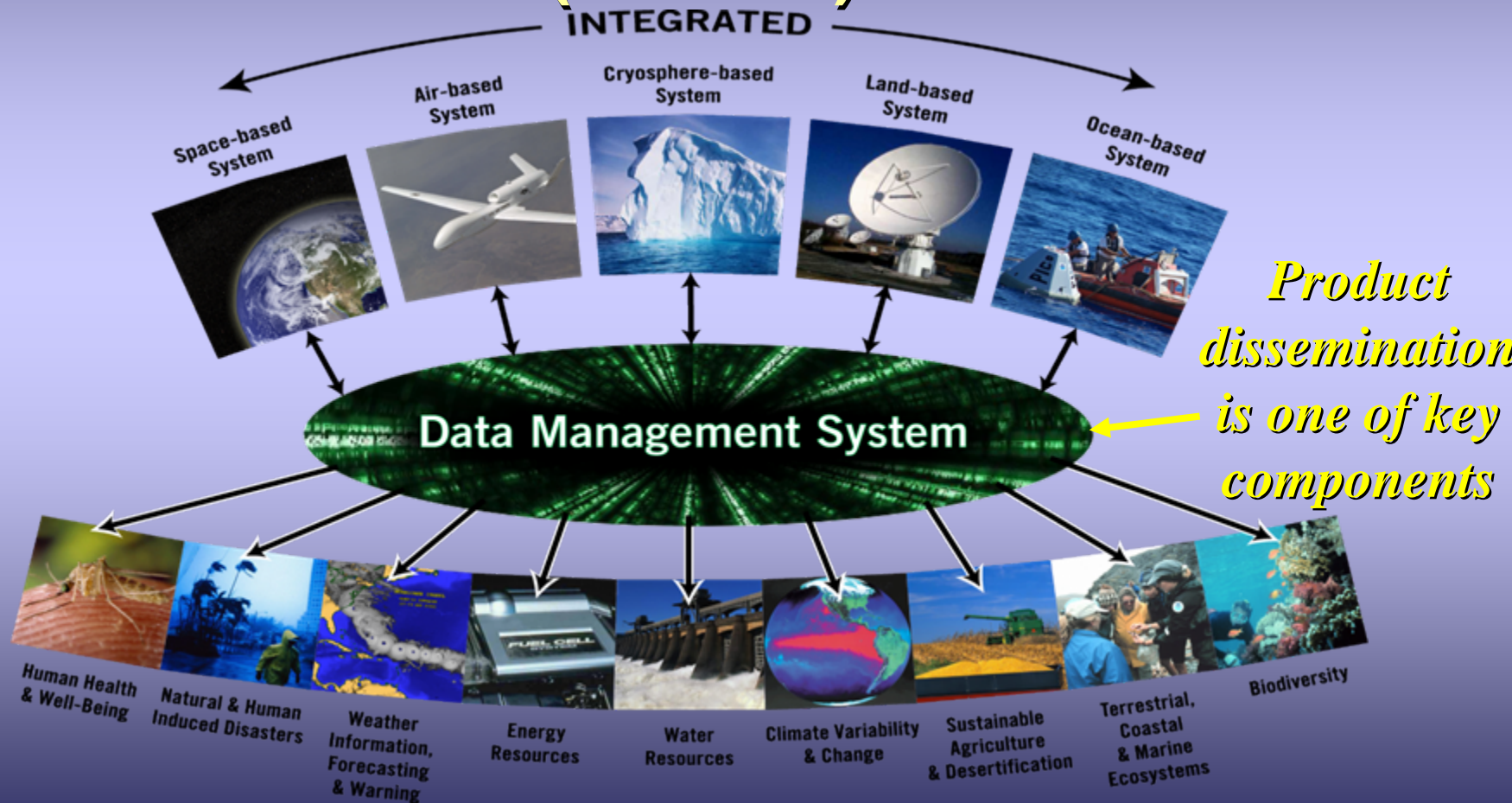
is the regional component of GEONETCast, provided by the U.S./NOAA, covering most of North, Central, and South Americas and surrounding ocean areas



Global GEONETCast Coverage



Global Earth Observation System of Systems (GEOSS)





NOAA's 2007 Objectives

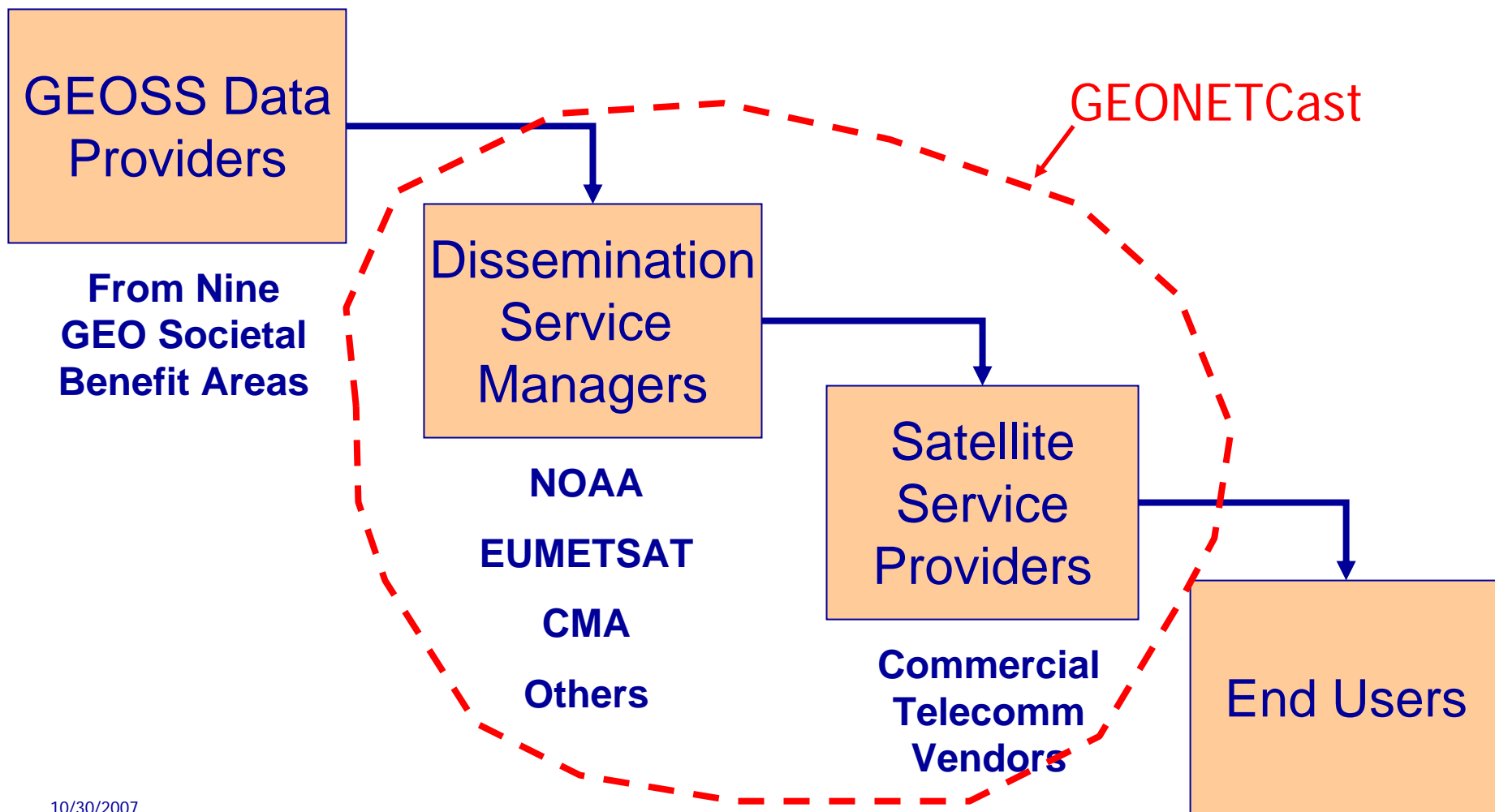
- Finalize NOAA's functional and system requirements
 - Completed in April 2007
- Release commercial request for proposals, review proposals, and award commercial services contract
 - Completed September 12, 2007
- Implement an initial operational capability serving most of North, Central, and South America as soon as possible
 - Expecting delivery of an initial system to NOAA for configuration and testing by Nov. 13th
 - Expecting launch of new operational service by late January 2008
- Demonstrate it internationally at the 4th Earth Observation Summit in South Africa in late November





Major Global Participants

Connecting Data Providers to Data Users via Satellite





GEONETCast Americas Services

- Intelsat General Corp. (IGEN) won the one-year contract with 4 one-year options to extend service period
- IGEN will subcontract with KenCast, Inc. to provide their IP-over-DVB multicasting server/client software called Fazzt
- Start out initially with 2 Mbits/sec data bandwidth with options to expand up to 10 Mbits/sec
- Intelsat-9 (IS-9) geostationary communications satellite will be used to cover most of the Americas using a multiplexed C-band DVB-S transponder

Intelsat-9 C-band Satellite Coverage

Red contours denote coverage using a 2.4 m receive antenna

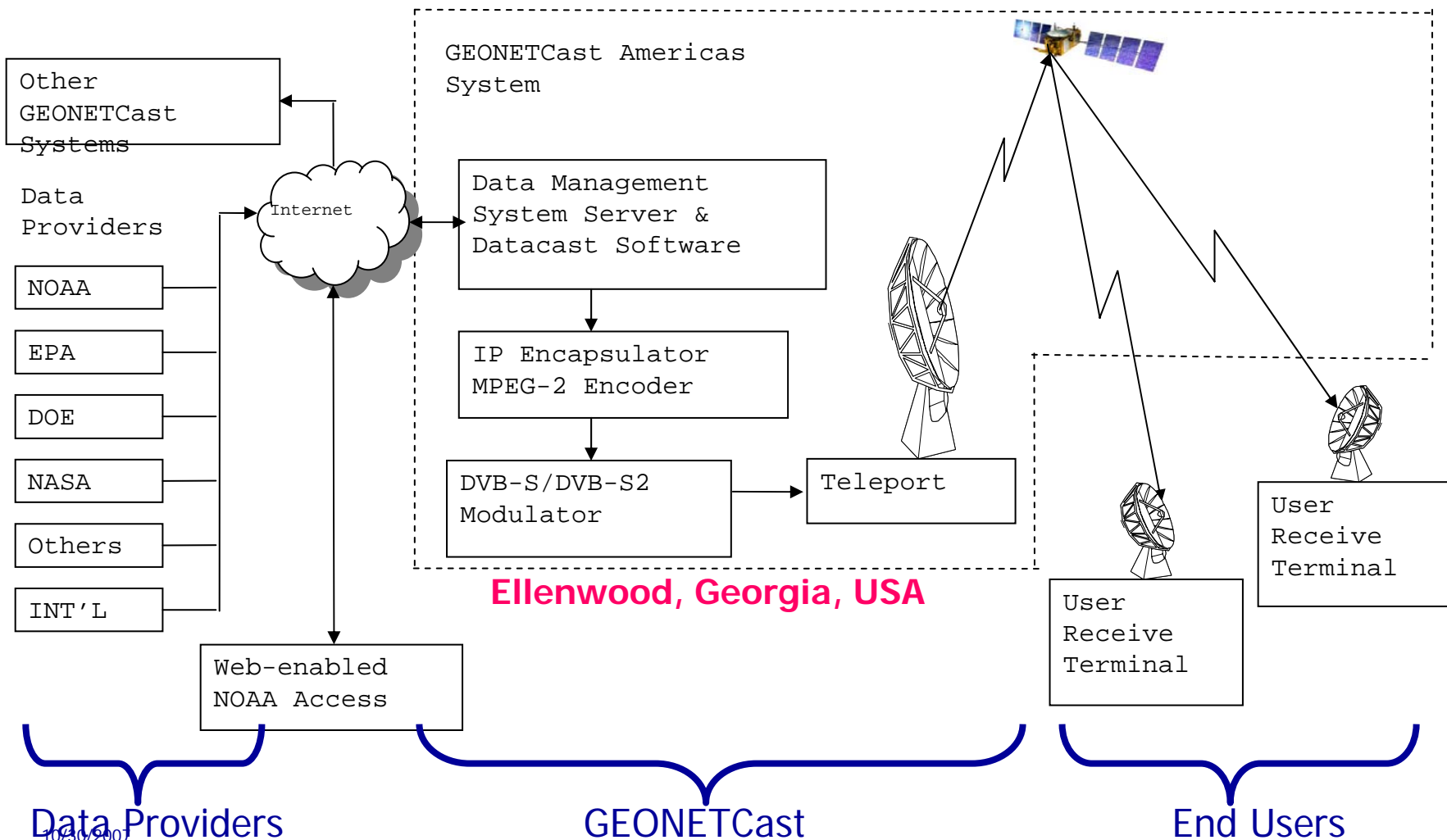




GEONETCast Americas Services (cont.)

- Options to expand satellite geographic coverage over eastern Pacific Ocean/Hawaii/Alaska via a second satellite
- >99.9% service availability
- Satellite uplink teleport will be located in Ellenwood, Georgia in the southeastern U.S.
- NOAA will configure and manage the service remotely from the NOAA Satellite Operations Facility in Suitland, Maryland

GEONETCast Americas System Architecture



GEONETCast Americas Receive Station

- Personal computer with KenCast client software
- Satellite antenna ~2.4m
- DVB-S 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 user costs ~\$2000-2500
 - Personal computer - ~\$500
 - Client datacasting software - \$150 one-time license
 - 2.4m antenna including LNB - \$1000-2000 *
 - DVB-S receiver - ~\$100
 - No recurring subscription costs to receive the broadcast data

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



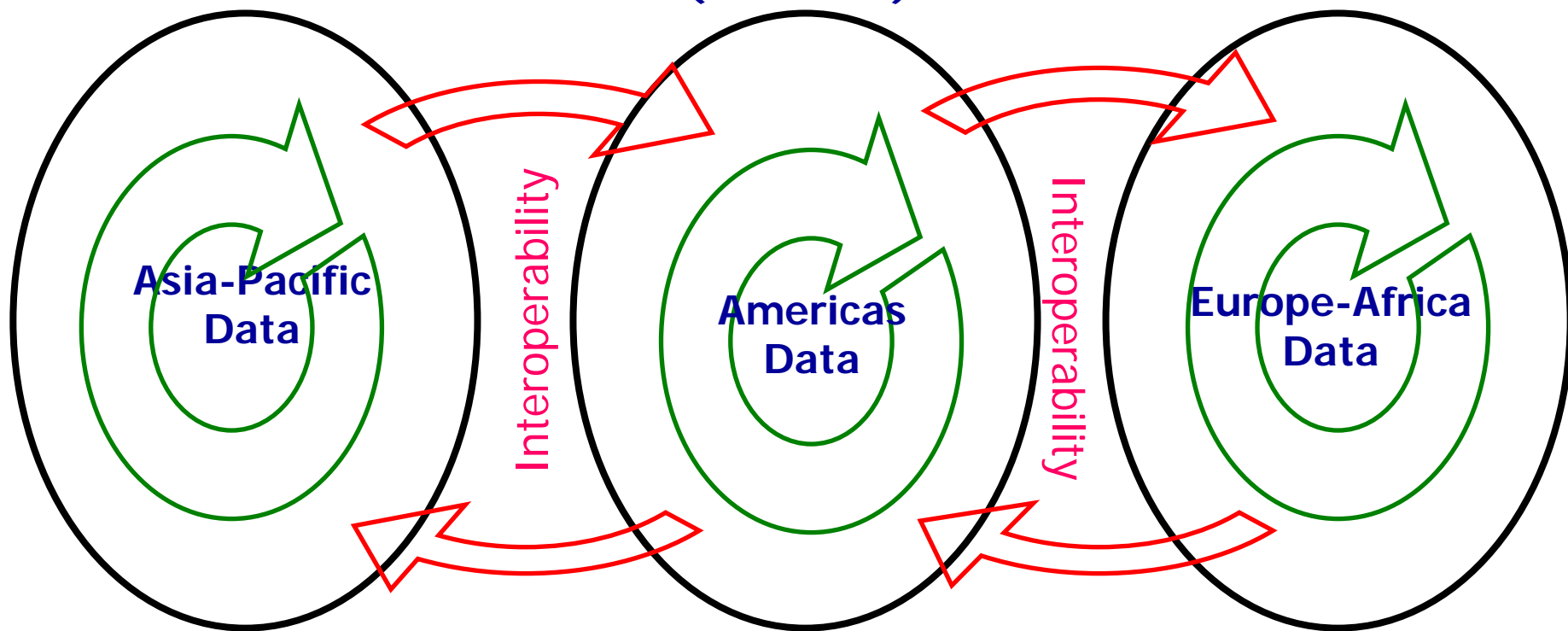
GEONETCast Global Data Exchange

A globally-integrated system of regional systems

FengyunCast
(Asia-Pacific)

GEONETCast
Americas
(Americas)

EUMETCast
(Europe-Africa)



GEONETCast Americas Data Flow To and From the Americas

Products from the Americas



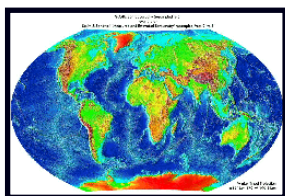
Intelsat-9



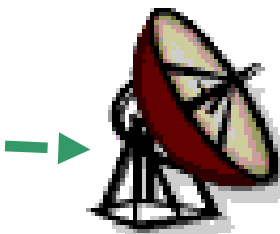
Other Satellites



Products from the World



Terrestrial



Network Center
(Ellenwood, GA)



End Users in the Americas



Other Global Uplinks



Other Global End Users

Option #2

Option #1 Terrestrial

Interoperability Interfaces



GEONETCast Data Product Information

- Product broadcast channels
 - Separate broadcast channels by theme or data provider
 - Users can choose channels they wish to receive
- Product formats
 - There is no restriction on the format of products
 - Can be a variety of formats (ASCII, JPEG, GIF, HDF5, BUFR, NetCDF, GRIB2, others)
- Product discovery
 - Catalog of available products and their associated metadata will be distributed via satellite and published on GEONETCast Americas web site
- Access control of GEONETCast Americas data
 - Free and open but can accommodate restricted data access if necessary



Sample of Initial GEONETCast Americas Products

- **Brazil National Institute for Space Research (INPE)**
 - Derived regional products including *fire monitoring, lightning, rainfall nowcasting, UV Index, vegetation*
- **Central America/NASA SERVIR**
 - *MODIS fire images* over Guatemala, and *short-term rainfall forecasts* from WRF and MM5 models
- **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
 - North American Drought Monitor
 - Chlorophyll concentration over the Caribbean Sea
 - Global soil moisture
 - Planned RANET Latin American regional products (USAID & NOAA)





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 information forms defining information on products you wish to contribute
 - Completed standard GEONETCast information forms defining information on products you wish to have access to



Summary

- NOAA/U.S. is committed to provide a regional initial operational capability over the Americas with potential for expansion
- We're preparing for next month's Earth Observation Summit and our new service kick-off
- We look forward to partnering with data providers and end users to provide a data dissemination service for global environmental information users and decision makers



NOAA's GEONETCast Americas Web Page (under construction)

- <http://geonetcastamericas.noaa.gov>

GEO's GEONETCast Web Page

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

Thank you

