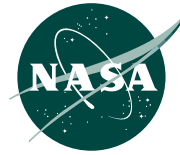


IGEX-98 DATA FLOW

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IGEX-98 Workshop
Nashville, Tennessee
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IGEX-98 DATA FLOW

- ◆ IGEX philosophy
- ◆ Participation summary
- ◆ IGEX data and products
- ◆ IGEX data flow
- ◆ IGEX data centers
- ◆ Problems encountered
- ◆ Conclusions/Recommendations



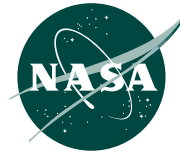
IGEX PHILOSOPHY



- ◆ **IGEX infrastructure modeled after the IGS**
- ◆ **Hierarchy of data centers**
- ◆ **Allows for redundancy and backup**
- ◆ **Reduces network traffic**
- ◆ **Many participants also serve within the IGS**



PARTICIPATION SUMMARY



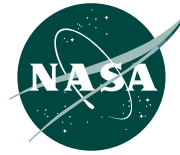
- ◆ **74 receivers at 62 sites sent data to IGEX data centers**
 - 47 dual-frequency
 - 20 single-frequency
 - 7 GPS-only receivers
- ◆ **30-35 receivers continue to operate**
- ◆ **30 SLR stations**
 - Tracked 18 GLONASS satellites
 - Nearly 6,500 passes and 37K normal points archived during campaign

INTERNATIONAL GLONASS EXPERIMENT (IGEX-98) NETWORK





IGEX DATA and PRODUCTS



◆ GLONASS DATA:

- Daily files (00:00:00 and 23:59:30 GPS time)
- 30-second sampling rate
- Observation, GPS and GLONASS navigation, and optional meteorological data
- RINEX format (Hatanaka and UNIX compression)
- Data from receiver to global data center within 48 hours

◆ IGEX PRODUCTS:

- Daily or weekly GLONASS ephemerides in SP3 format
- Satellite clock information
- Earth rotation parameters
- Station coordinates in SINEX format



IGEX FILE NAMING CONVENTION

(Data)

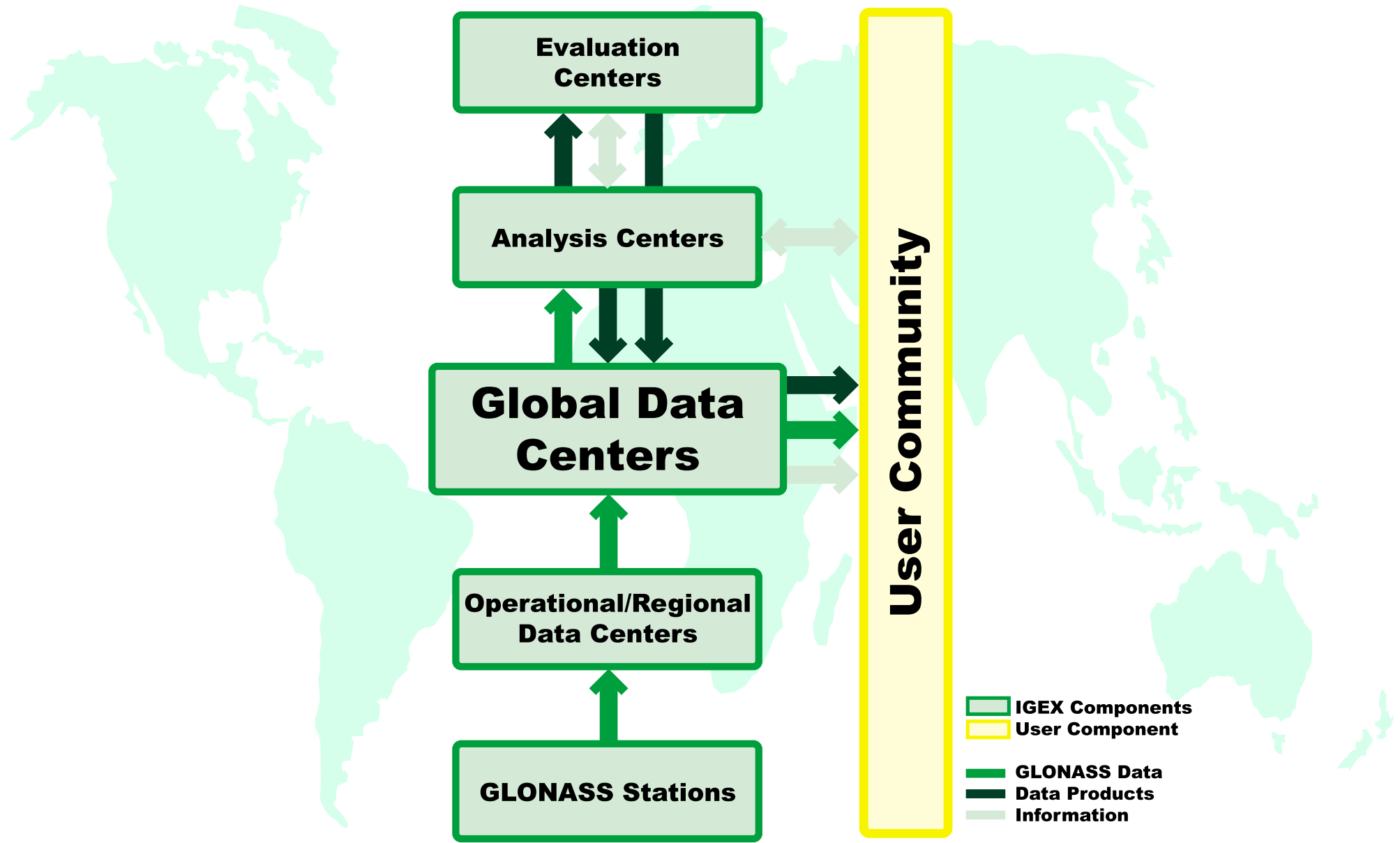
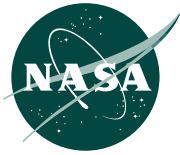


- ◆ Files named **ssssddd0.yyt.Z** where
 - **ssss** is 4-character monument ID for site
 - **ddd** is 3-digit day of year
 - **0** indicates file contains all data for data day
 - **yy** is 2-digit year
 - **t** is file type
 - ◆ **o** is observation file
 - ◆ **n** is GPS navigation file
 - ◆ **g** is GLONASS navigation file
 - ◆ **m** is meteorological data file
 - ◆ **s** is summary file containing data quality information
- ◆ Filenames in lowercase (except for the .Z)

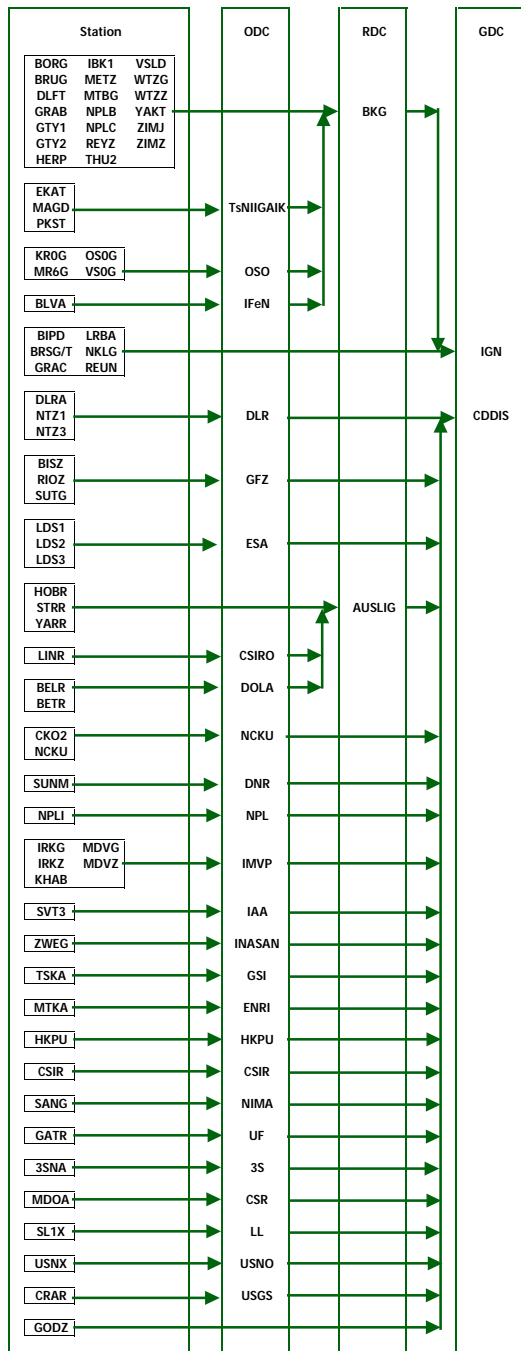


IGEX DATA FLOW

(General)



IGEX Data Flow (by Data Center)

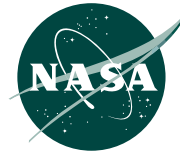


Acronyms

- AUSLIG Australian Land Information Group
- BKG Bundesamt für Kartographie und Geodäsie, Germany
- CDDIS Crustal Dynamics Data Information System, USA
- CSIR Council for Scientific and Industrial Research, South Africa
- CSIRO Commonwealth Scientific and Industrial Research Organisation, Australia
- CSR Center for Space Research, University of Texas at Austin, USA
- DLR Deutsches Zentrum für Luft- und Raumfahrt, Germany
- DNR Department of Natural Resources, Australia
- DOLA Department of Land Administration, Australia
- ENRI Electronic Navigation Research Institute, Japan
- ESA European Space Agency, Germany
- GDC Global Data Center
- GFZ GeoForschungsZentrum, Germany
- GSI Geographic Survey Institute, Japan
- HKPU Hong Kong Polytechnic University, China
- IAA Institute of Applied Astronomy, Russia
- IfeN Institute of Applied Geodesy/University FAF Munich, Germany
- IGN Institut Geographique National, France
- IMVP Institute of Metrology for Time and Space, Russia
- INASAN Institute of Astronomy, Russian Academy of Sciences
- LDC Local Data Center
- LL Lincoln Labs, USA
- NIMA National Imagery and Mapping Agency, USA
- NCKU National Cheng Kung University, Taiwan
- NPL National Physical Laboratory, India
- OC Operational Center
- OSO Onsala Space Observatory, Sweden
- RDC Regional Data Center
- TsNIIGAIAK Central Research Institute of Geodesy, Aerial Surveying, and Cartography, Russia
- UF University of Florida, USA
- USGS U.S. Geological Survey, USA
- USNO U.S. Naval Observatory, USA
- 3S 3-S Navigation, USA



IGEX DATA CENTERS



◆ Operational

- Data from station
- RINEX and QC data
- Transmit to regional or global data center

◆ Regional

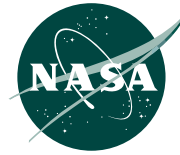
- Gather data from operational centers
- Transmit to global data center
- BKG, DLR, GFZ, ESA, AUSLIG, NCKU

◆ Global

- Provide archive of and access to data and products
- CDDIS, IGN



PROBLEMS ENCOUNTERED

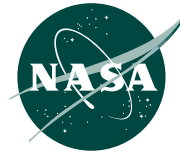


- ◆ **Missing site logs: CKO2, EKAT, GATR, MAGD, NCKU, NPLI, PKST, YAKT**
- ◆ **TEQC**
 - Required modification for GLONASS data type
 - Required modification to handle converter problems
- ◆ **File format problems**
 - Compression Gzip, not UNIX compress
 - ASCII not binary file transfer
 - Extra <CR>s
- ◆ **File naming conventions**
 - Upper vs. lower case
 - .Z indicating compressed file
 - Misnamed files (d instead of o)
- ◆ **Null files transmitted to data centers**

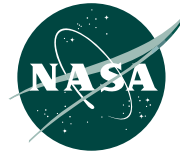


PROBLEMS ENCOUNTERED

(RINEX related)



- ◆ **RINEX headers**
 - non-conformance to standard
 - missing lines
- ◆ **Receiver/antenna naming -- non-conformance to IGS standards**
- ◆ **V1 instead of V2**
- ◆ **Satellite number 0**
 - Valid output for GG24 receiver
 - Invalid for RINEX
- ◆ **RINEX converter problems**
 - Time regression error with 3S converter
 - Field overflow (phase data) in Z-18 converter



CONCLUSIONS/ RECOMMENDATIONS

- ◆ **Stations**
 - Follow guidelines
- ◆ **Operational data centers**
 - Need to be clearly identified and consolidated (perhaps)
 - Responsibilities defined
 - Timeliness
 - More rigorous QC
 - ◆ TEQC
 - ◆ DUT integrity monitoring s/w?
- ◆ **Global data centers**
 - Need to ensure consistent data holdings