BOSTON COLLEGE
ISR
INSTITUTE FOR SCIENTIFIC RESEARCH

SCINDA Update

Keith Groves

Boston College

keith.groves@bc.edu

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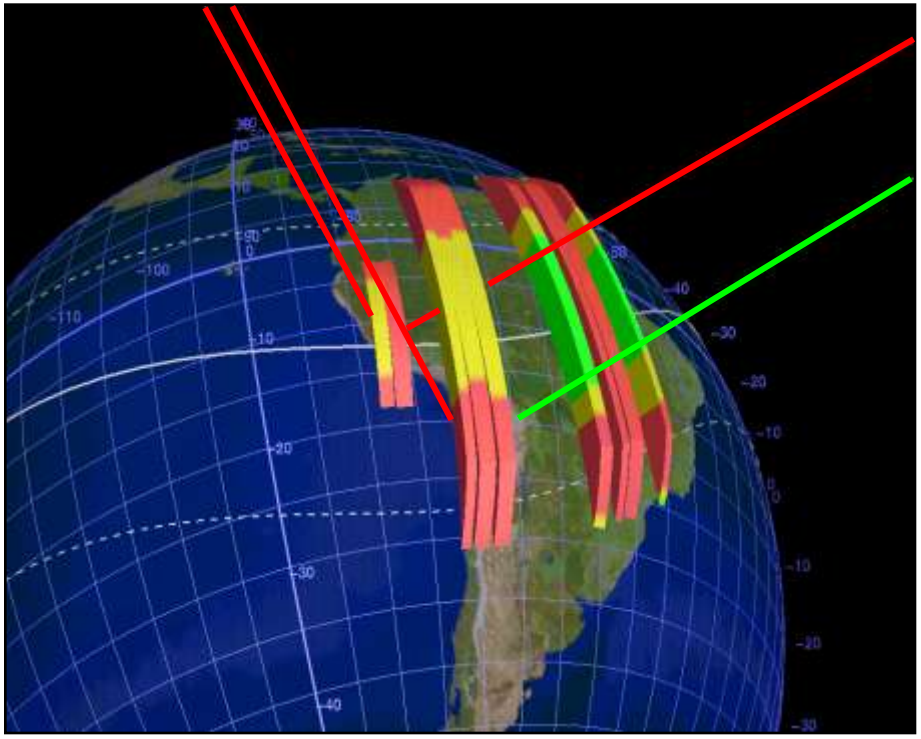
SCINTILLATION NETWORK DECISION AID (SCINDA)

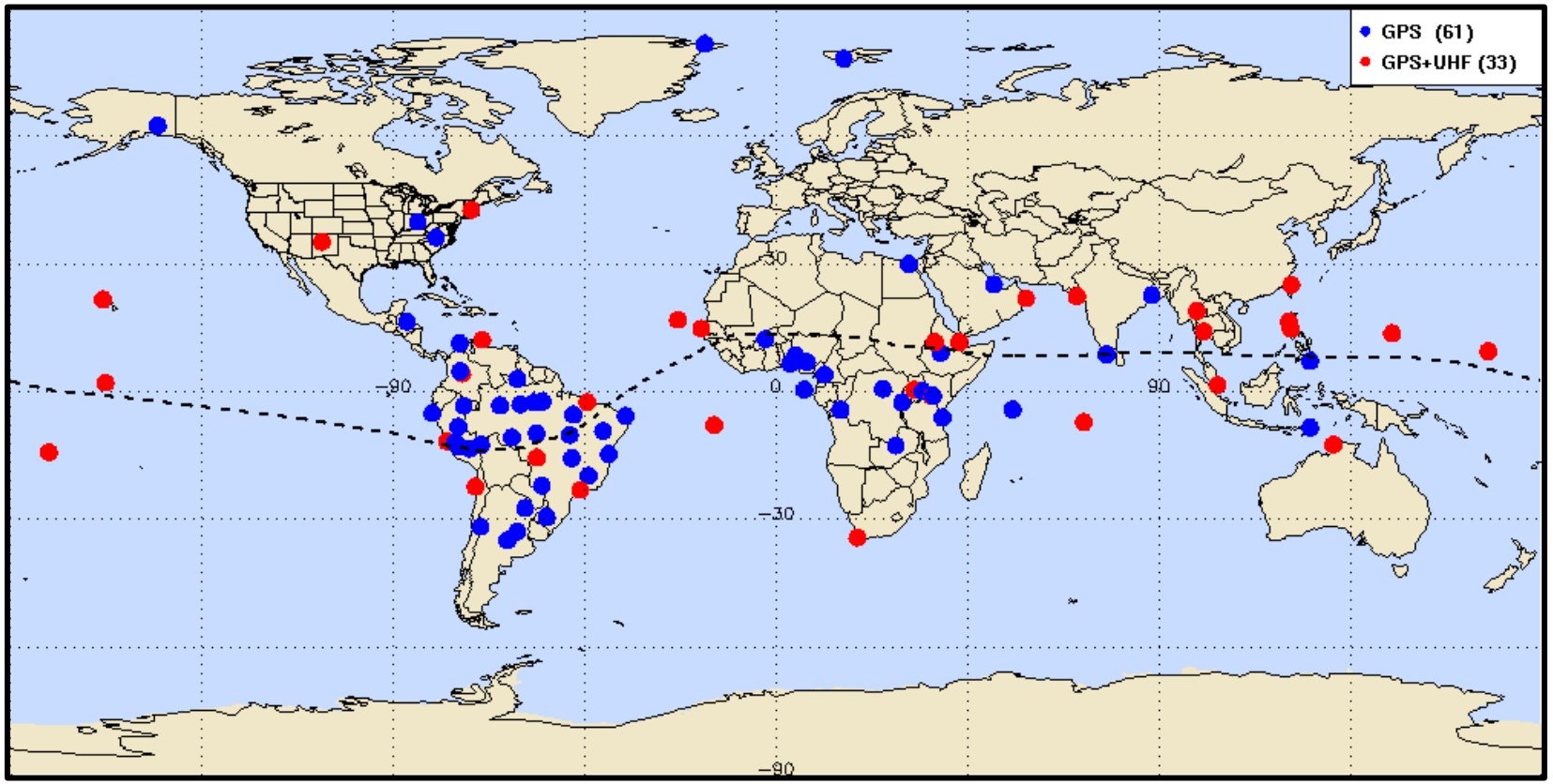
A *regional nowcasting system* to support research and users of space-based communication and navigation systems



- Ground-based sensor network
  - Passive UHF / L-band /GPS scintillation receivers
  - Measures scintillation intensity, eastward drift velocity, and TEC
  - Automated real-time data retrieval via internet
- Data supports research and space weather users
  - Understand on-set, evolution and dynamics of large-scale ionospheric disturbances
  - Empirical model provides simplified visualizations of scintillation regions in real-time

All Sites as of March 2015

- Shown below are the sites containing SCINDA hardware as noted in the legend
- The status of individual sites is not indicated; several are not healthy or real-time
- Sites unsupported since 2014



Update

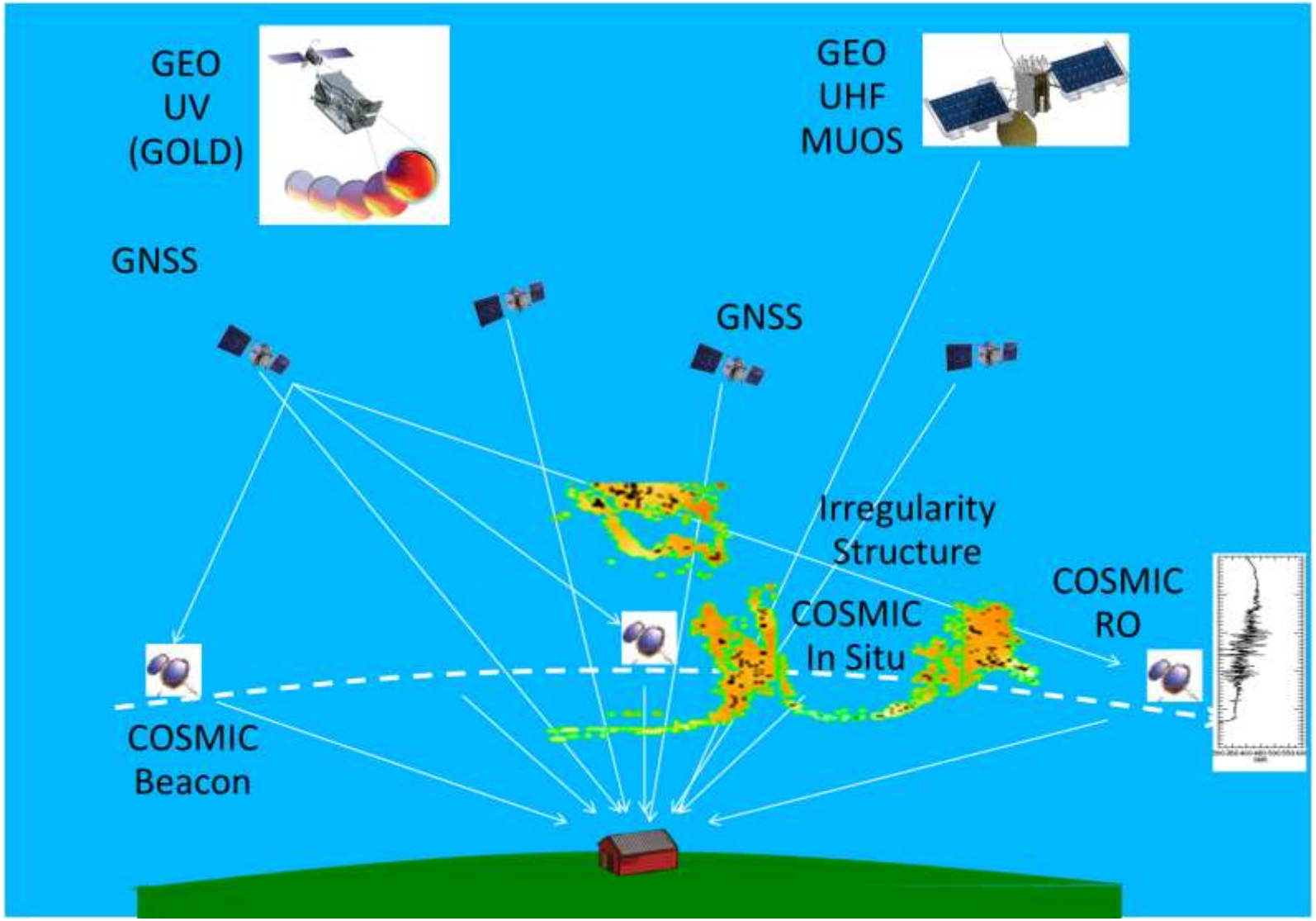
What's New

- Good potential to receive support for ground stations beginning in late 2020
- Initial demonstration of real-time capabilities and evaluation of next-generation sensors (18 months)
- If successful, may lead to longer term support going forward

What's Needed

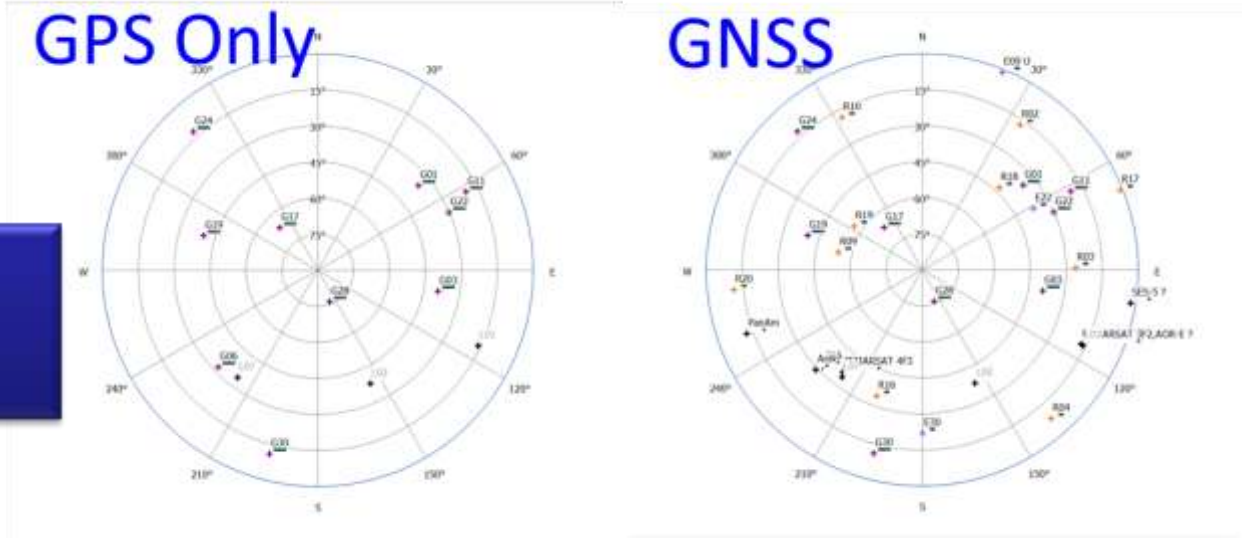
- Hardware refresh at all locations
- Additional sensors for additional sources
- More emphasis on reliability and maintainability

New RF Sources Enhance Future Scintillation Monitoring Capabilities



GNSS vs GPS

Provides Scintillation and TEC



- GNSS now provides > 2x sources (signals and sats) relative to GPS only observations, greatly improves coverage and resolution
- Systems include GLONASS, Galileo & Beidou; sources will only increase in the future

SCINDA Summary

- Improved outlook for ground systems support is encouraging for the future
- Need to increase sensing capabilities to keep pace with opportunities for monitoring ionospheric irregularities
  - Weaker solar cycles benefit from lower frequency observations (VHF)
- Initial phase of new activity focused on demonstration of capabilities and evaluation of new GNSS sensors
- Success will lead to more stable sustainment environment and opportunities for new stations and sensors
- New less restrictive data access policy in effect

Excited by the prospect for continued participation in ISWI

SCINDA Data Policy

- Access to data restricted to host PI for a period of 6 months after collection*
  - Data can be available during the restricted window through coordination with BC or host PI
- Existing and current data will be placed on a publicly accessible website (Madrigal?) after the restricted period ends
  - BC will attempt to impose some quality assurance measures on data before posting for public-use

* Restriction extended to 12 months for the first two years after a site is established