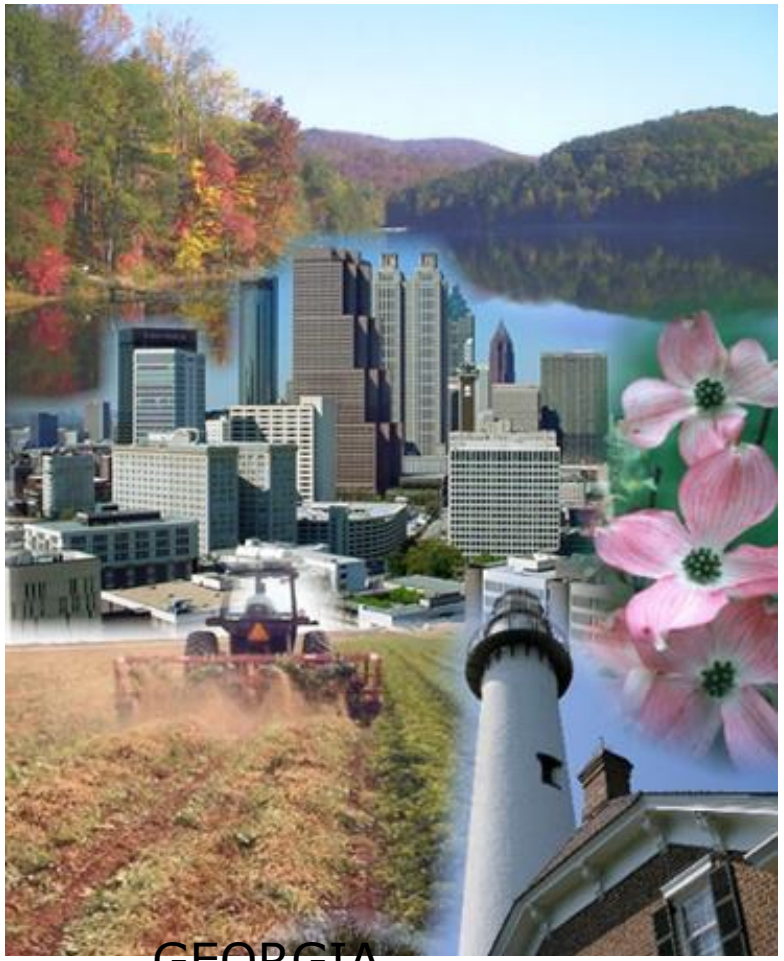
eGPS RTN – History & Lessons Learned

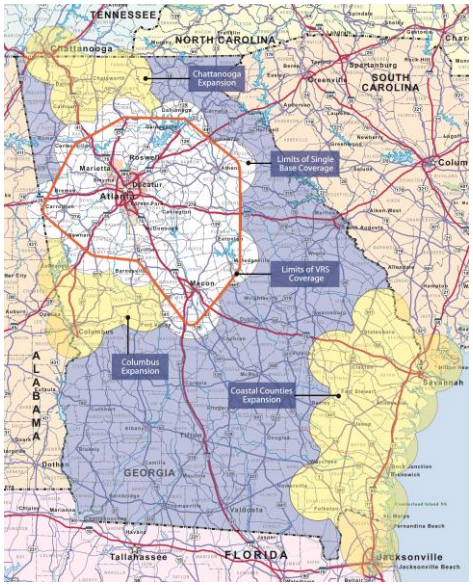


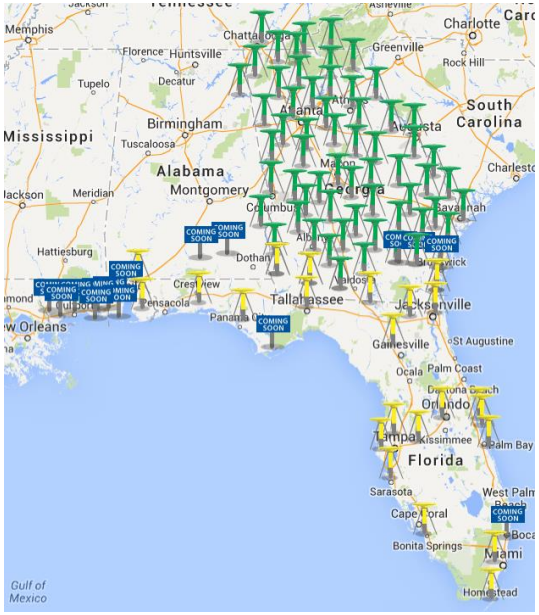
GEORGIA

Lonnie Sears, PLS (Leonidas B. Sears, III)

- Past President of the Survey and Mapping Society of Georgia (SAMSOG)
- Chairman of the Geospatial committee
- Serving on the education committee
- Surveying since 1981; licensed since 1993
- 1984 Graduate of West Virginia University Institute of Technology
- President of eGPS Solutions, Inc., Norcross, GA
- Licensed in GA, FL, AL, TN, NC, MS
- USMC 1977 – 1981 (Leatherneck, Devil-dog, Jar-head)

Historic Timeline of eGPS





Our History

July 2004	July 2007	January 2008	September 2008	January 2011	August 2012	November 2013	July 2014
Launched eGPS as the 1st RTN in Georgia.	1st RTN to introduce Glonass RTN coverage in North America.	Completed statewide centimeter coverage of Georgia.	Completed statewide centimeter coverage of Florida.	Established the Ohio Agriculture RTN for SignalOne.	Mature Rental fleet of Champion GPS and Trimble Robots	Established the Houston, Texas Capital COOP RTN	Became a Leica Authorized Dealer

Hard learned lessons

- All internet connections are not reliable
  - Cellular data latencies
  - Satellite data latencies
  - Small ISPs have issues

- Site selection is of paramount importance
  - Permanent is subjective
  - Relocation is expensive
  - NGS construction guidelines published
  - Site recon bracket type, wiring routes, IT, Power
  - Written site agreements

Hard Lessons Learned

Software providers change their focus

- Expensive maintenance agreements
- National network focus of Trimble, Leica, and Topcon
- New platforms equal new software purchases
- One constant is you never finish paying for the RTN software
- Your goals do not match each others

Correction Message Types are not understood

-RTCM 2.1, 2.3, 3.0, 3.1, 3.x
- CMR, CMR+, (Trimble Vs. world)
-Proprietary NCT, Leica, CMRX

Hard Lessons Learned

Remote control and reboot devices

- Saves travel costs
- Inexpensive compared to labor and travel
- Analog side of DSL is best to reset modem

CORS Maintenance Costs and Procedures

- Keep a replacement kit at the ready
- Lightning, wear, age, obsolesce
- Site changes (Trees, buildings, fences, ect…)
- Building abandonments
- Theft
- Inland Marine Insurance costs
- Cables and connectors LMR400

Hard Lessons Learned

Bandwidth utilization at the servers

- Buffer limits of ISP at their routers
- T1, to T2, to Ethernet (Fiber Optic)
- Server OS and Hardware maintenance
- Software and Hardware dongles (Licensing)
  - Hard to maintain redundancy due to licensing

RINEX file storage space

- epoch rate compounds size
- How long do you store it?
- CORS maintenance outages

Best Resources

NGS –
- Datum realizations and their differences
- Geoid separation files
- educational materials for our customers, field procedure guidelines, OPUS, Tools.
- Absolute antenna calibrations

RTN software providers
- Specific application guides
- Experience
- Expertise
- Theory and Practice of RTN Tech

Best Resources

Conferences and Seminars

- ION
- RTN operators meetings hosted by NGS
- NGS Best Management Practices
- InterGeo

Customer or User feedback

- Static download availability
- Local RTN Outages
- Cellular Data outages and changes
- Atmospheric condition - correlation to models
- Data Collector software “Bugs”

Questions ?