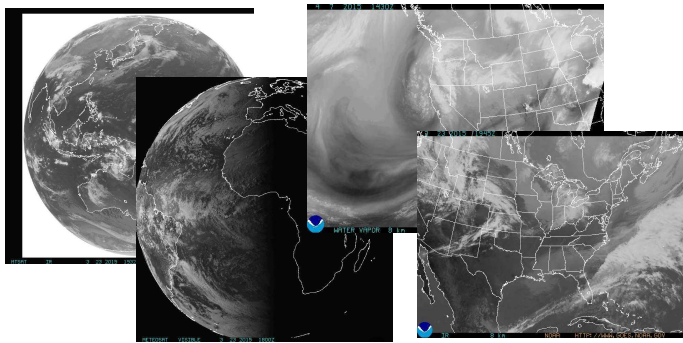# Overview of the GOES-R HRIT/EMWIN System and Impacts to the User Community

Steve Britton, Andrew Krepps, Jonathan Terrell, Solers Inc.

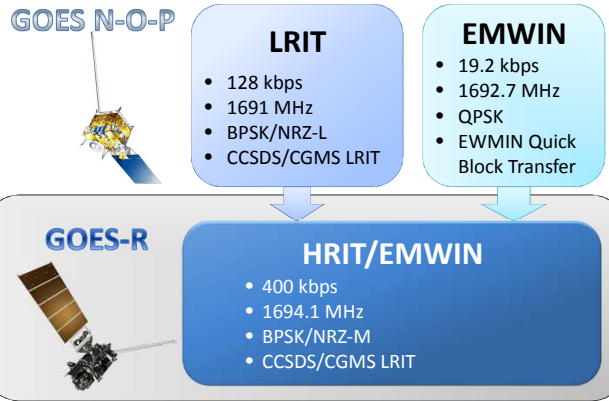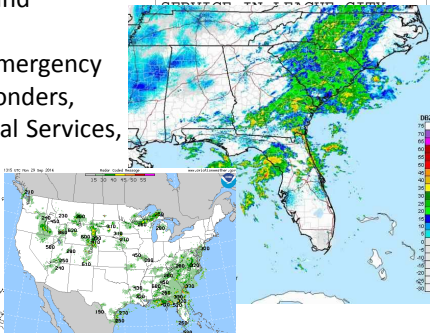## Low Rate Information Transmission (LRIT)

- LRIT is a low data rate rebroadcast of reduced resolution NOAA data and products, and acts as a secondary satellite broadcast of EMWIN and DCS data
- Can be received by anyone with a low cost receiver system
- Users include: Private citizens, U.S. Military (Armed Forces, Army Corps Engineers), Foreign Meteorological Services/Agencies, and U.S. Agencies

GOES N-O-P

LRIT
- 128 kbps
- 1691 MHz
- BPSK/NRZ-L
- CCSDS/CGMS LRIT

EMWIN
- 19.2 kbps
- 1692.7 MHz
- QPSK
- EWMIN Quick Block Transfer

GOES-R

HRIT/EMWIN
- 400 kbps
- 1694.1 MHz
- BPSK/NRZ-M
- CCSDS/CGMS LRIT

HRIT/EMWIN in the GOES-R Era

- The HRIT/EMWIN system combines LRIT and EMWIN into a single satellite broadcast service and serves as the primary satellite rebroadcast of DCS data
- Current LRIT and EMWIN distribution to be maintained through the life of GOES N-O-P spacecraft
- HRIT/EMWIN to become available when GOES-R becomes operational
- Dedicated EMWIN feed will no longer be available on GOES-R

Content Enhancements

- More frequent and/or higher resolution images
- GOES-R Advanced Baseline Imager (ABI) products
- Inclusion of GOES-R ABI Level 2+ products
- Enhanced EMWIN product metadata
- Additional imagery from MTSAT and Meteosat

Emergency Managers Weather Information Network (EMWIN)

- The Emergency Managers Weather Information Network (EMWIN) is a robust weather data broadcast service, providing public weather alerts, watches, warnings, forecasts, and graphical products
- Users include: U.S. Emergency Managers, First Responders, Foreign Meteorological Services, and Private Citizens

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FFWHGX TXC039-071-167-
201-212300- /BULLETIN -
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FLASH FLOOD WARNING
NATIONAL WEATHER SERVICE
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PM CDT SAT MAR 21 2015
THE NATIONAL WEATHER
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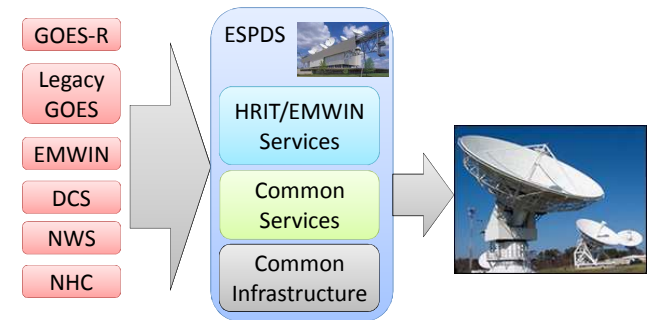

GOES-R HRIT Prototype Receiver

- Low cost design based on Software Defined Radio Platform
- Provides reference design for system users, manufacturers and hobbyists
- Full details publicly available from the GOES-R web site
- **http://www.goes-r.gov/users/hrit.html**
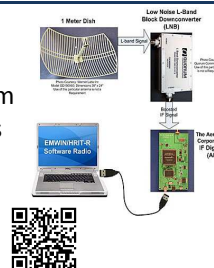
Product Distribution System

- The HRIT/EMWIN data stream will be produced by the Environmental Satellite Processing and Distribution System (ESPDS) in the Environmental Satellite Processing Center (ESPC)
- ESPDS will be ESPC's next generation system for the delivery of these services using an enterprise approach across the various architectural segments.

GOES-R | Legacy GOES | EMWIN | DCS | NWS | NHC

ESPDS
- HRIT/EMWIN Services
- Common Services
- Common Infrastructure

Major New System Capabilities
- Virtual channelization for data product assignment and filtering of data by users
- Automatic retransmission of critical weather information
- Dynamic bandwidth allocation
- Automated data quality monitoring

Impacts to End-User Receiver Systems

LRIT
- May require hardware upgrades to support HRIT data rate, broadcast frequency, and signal modulation (NRZ-M)
- Receiver system software modifications may be required to support new product identifiers in file header
- Imagery will continue to be RICE compressed

EMWIN
- Existing receivers will become obsolete
- Files will be broadcast as CGMS HRIT/LRIT files
- Graphic products will utilize JPG and GIF compression
- End user software will require modifications to receive the broadcast and to keep compatibility with legacy end user software