



EMWIN OVERVIEW

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NWS EMWIN

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Outline

- EMWIN System Description
- Users of EMWIN
- EMWIN and the GOES-N Satellite Generation
- EMWIN and the GOES-R Satellite Generation
- Project Accomplishments
- In Conclusion

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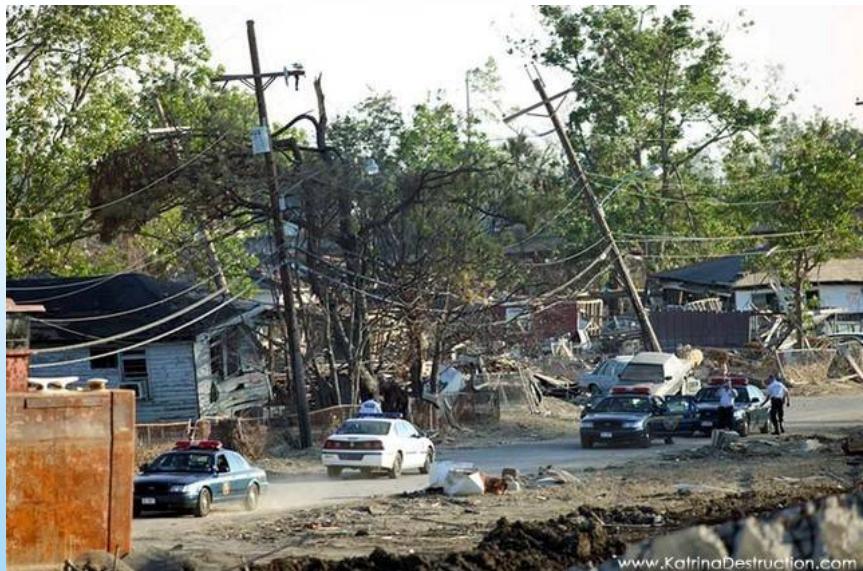
What is EMWIN?

- The Emergency Managers Weather Information Network is a priority-driven computer weather data broadcast system that takes advantage of minimal bandwidth.
- EMWIN provides rapid Satellite, VHF Radio, and Internet dissemination of:
 - Alerts/Watches/Warnings < 1 minute
 - Forecasts
 - Graphics, Imagery
 - Hurricane tracking and tropical storm data

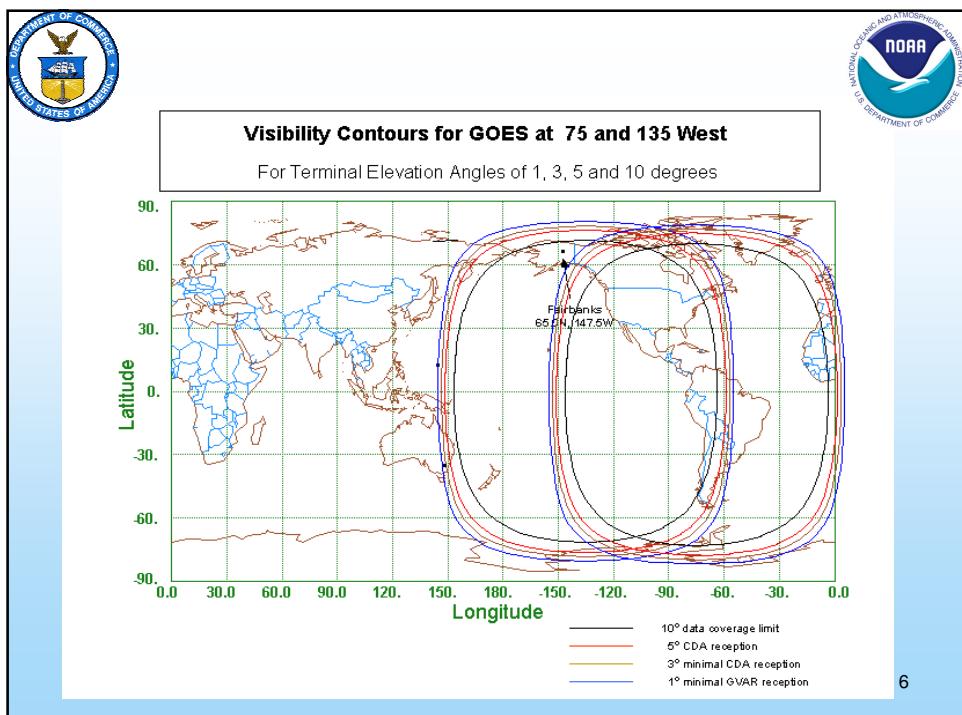
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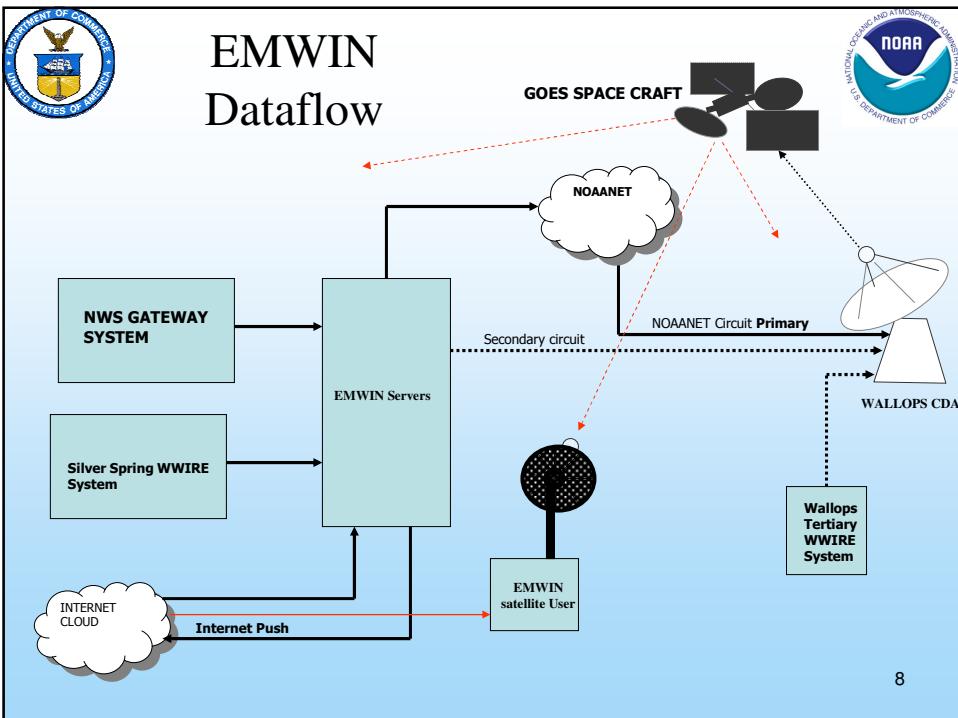


How it works



- Data is collected from the Gateway, Weather Wire and the Internet
- Assembled and prioritized
- Sent to NESDIS, (Wallops CDA) where it is up-linked to GOES 11 and GOES 12
- Sent further west via “Peace Sat” (NOAA donated GOES-7) in a cooperative effort between NWS Pacific Region and the Univ. of Hawaii
- Transmitted via VHF radio (local re-broadcast) in some areas
- Sent on the Internet via IP unicast

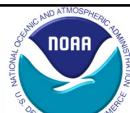
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Typical VHF Re-transmission System



1690.725MHz

GOES WEST dish

1690.725MHz

GOES EAST dish

Internet or
Intranet
cloud

Receiver

Custom local EMWIN Data stream

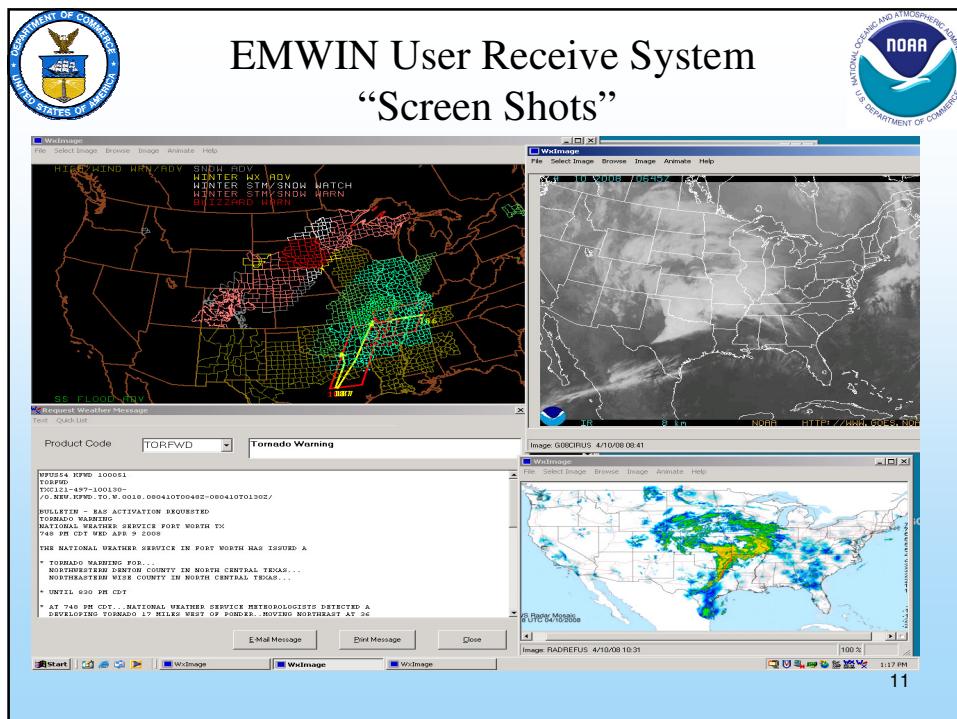
EMWIN SERVER

VHF Transmitter

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EMWIN Domestic Users

- Local and National Emergency managers
- Storm Spotters
- Schools
- TV Stations
- Emergency Responders
- Re-broadcasters using VHF
- Paging networks
- Weather Channel

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EMWIN International Users



- Pacific Rim Nations
 - “Peace Sat” relays the EMWIN data stream from Univ. of Hawaii
 - Provides advance warnings eg. Tsunamis and Typhoons
 - Testimonials show that after a severe event the only weather system still functioning was EMWIN
 - AsiaStar now broadcasts portions of EMWIN data
- Canada
 - Canadian Meteorological Service uses for warnings
- Caribbean, Central & South American Nations
 - As of 2007 many Caribbean island nations implemented EMWIN systems for Emergency Management
 - In Latin America used for hurricane preparedness and flooding, volcanic ash etc.

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EMWIN GOES-N Satellite



- **GOES N thru P constellation changes**
 - Power reduced
 - Frequency changes
 - Modulation scheme changes
 - Latest generation receivers are transition ready
- **Improved transmit technologies**
 - Speed doubles
 - Forward error correction
 - Allows enhancement of the data stream
 - Coding gains used to retain current user dish size
 - Dedicated transponder

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EMWIN GOES-R Satellite



- **GOES R constellation**
 - Combined EMWIN/LRIT transponder
 - Greater user/vendor base
 - Additional cooperation between NESDIS and NWS
 - Frequency, modulation, and power change
 - Combined speed increases to 400+ KBPS
 - Forward error correction
 - User satellite dish remains the same size
 - Backwards compatible software defined receiver prototype
 - Software defined receiver will be open source
 - Prototype demo to be held in Greenbelt, Md. summer 2008
 - GOES-R Program to give prototype receiver to NWS in Summer 2008

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EMWIN Satellite Transitions



ID	Task Name	2008			2009			2010			2011			2012			2013			2014			2015			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1	EMWIN Transition																									
2	EMWIN-I on GOES East - Series I/M Satellite																									
3	EMWIN-I on GOES West - Series I/M Satellite																									
4	EMWIN-N on GOES East - Probably GOES 13 (N) NLT 2011																									
5	EMWIN-N on GOES West - Probably GOES 14 (O) NLT 2011																									
6	EMWIN-R - Sometime after scheduled launch in 2015																									

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EMWIN Accomplishments



- EMWIN-I (9.6 kbs legacy L-band and internet bit stream)
 - NWS IA sponsored White House Third Border Initiative
 - Two Caribbean EMWIN-I training courses given in 2007
 - Systems donated to attending nations, with ongoing support
 - Invited to U.N. SPIDER conference in Barbados
- EMWIN-N (19.2 kbs L-band and internet bit stream)
 - User/vendor conference held to gather inputs for transition to EMWIN-N
 - Receiver is backwards compatible with EMWIN-I
 - GOES-10 dedicated as test platform for developers
 - 1 COTS user receive system developed using software receiver
- EMWIN-R (128 kbs or higher L-band and internet bit stream)
 - Initial prototype demo in March 2008 at Aerospace Corporation
 - Ground and space interface documents being formalized

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In Conclusion

- EMWIN is a low cost emergency management tool available now to all of the Caribbean area.
- Questions?

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