

HEMS WEATHER SUMMIT 2013

INDUSTRY TASKFORCE PRESENTATIONS

DECEMBER 18, 2013 WASHINGTON, D.C.

Facilitators:

Rex Alexander, National EMS Pilots Association

Tom Judge, International Helicopter Safety Team



PRESENTATIONS

- **HEMS Part 135 compared to other Charter Part 135 & 121**
- **HEMS Weather Accident Statistics**
- **HEMS Weather Tool A Historical Perspective**
- **HEMS Regulatory Requirements for Weather**
- **Weather Regulations, Advisory Circulars, LOA's, MOU's**
- **Economic Impact of the HEMS Weather Tool**
- **HEMS Weather Tool for other Aviation Operations**
- **HEMS Weather Tool Input Data**

HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

REX ALEXANDER



HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

- **What a HEMS pilot in the field can expect.**
 - 12-14 hour on site shifts
 - 7-on/7-off rotations, with day night switching
 - A local area with a 25-50 nm radius.
 - A service areas with a 150nm radius and greater.
 - An on call, immediate response status.
 - 10 minutes or less expected response time.

**Note Weather status (Green, Yellow & Red)*

HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

HEMS 135 On Demand

- A. **Unscheduled**
- B. **Takeoff times 10min or less**
- C. **Destination(s) identified at notification**
- D. **Destination can change enroute**
- E. **Flight planning done individually**
- F. **Off airport location (Hospitals)**
- G. **Generally no onsite weather reporting**
- H. **limited IFR infrastructure**
- I. **Weather 5000' feet and below**
- J. **Generally cruising at 500' to 1000' AGL**
- K. **Remote offsite scene operations**
- L. **Time sensitive & critically ill or injured**

Part 121

- A. **Scheduled**
- B. **Takeoff times known months in advance**
- C. **Destination(s) known months in advance**
- D. **Destination never changes**
- E. **Flight planning teams**
- F. **Terminal locations, airports only**
- G. **Always onsite weather reporting**
- H. **Fully accessible IFR infrastructure**
- I. **Weather above 12,000'**
- J. **Generally cruising at 12,000' MSL and up**
- K. **No offsite operations**
- L. **Standard passengers**

HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

- What HEMS pilots have had to work with in the past to accomplish this.



HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

- **What a Part 135 HEMS pilot uses for weather reporting?**
 - *Anything they can get their hands on!*

HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

- As a result of HEMS accidents, the NTSB made certain recommendations, one of which is the incorporation of-

Operational Control Centers



HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

The screenshot displays a flight tracking application with a map of North America and a sidebar listing aircraft. The sidebar shows three aircraft:

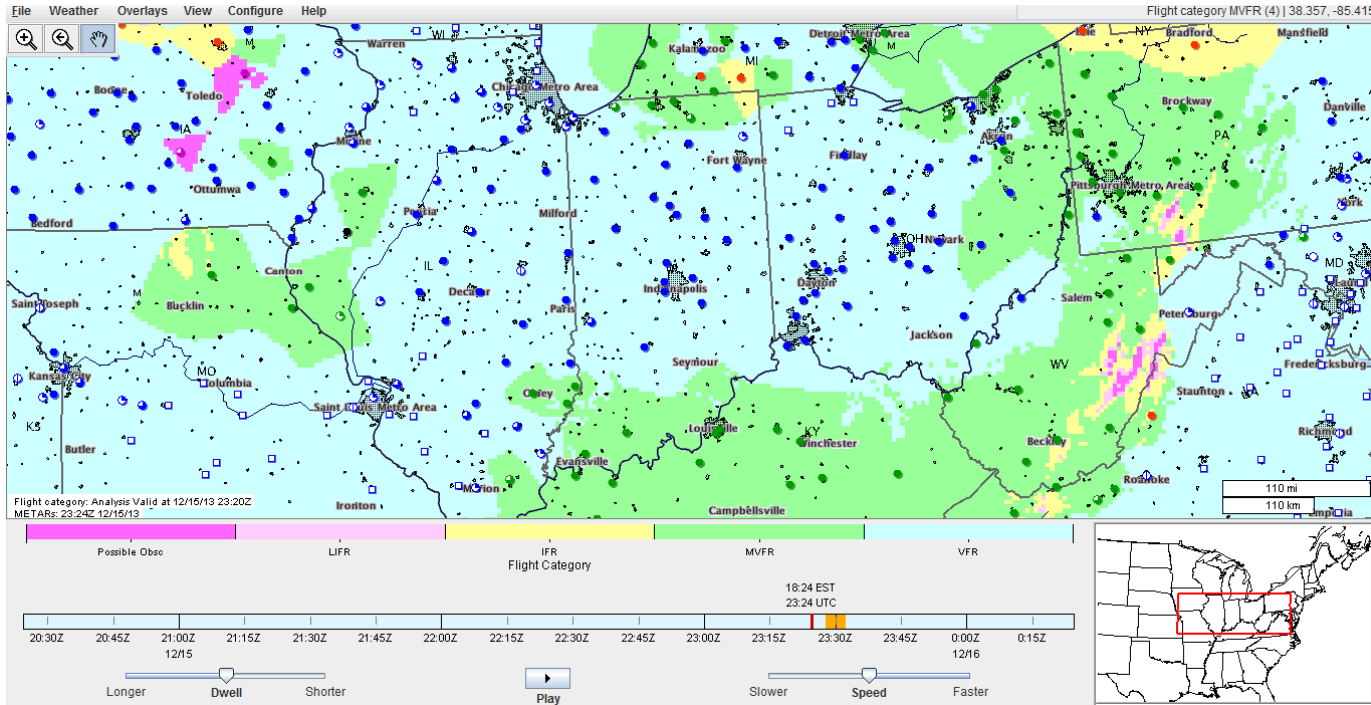
- Alias: N431P**
01/14/2013 16:17:41
Speed: 0 knots
Altitude: 400 MSL
Buttons: Track, VMsg, Alarm
- Alias: N723PH**
01/14/2013 16:20:50
Speed: 125 knots
Altitude: 2376 MSL
Buttons: Track, VMsg, Alarm
- Alias: N972AE**
01/14/2013 16:21:14
Speed: 21 knots
Altitude: 5184 MSL
Buttons: Track, VMsg, Alarm

The map shows the United States and Mexico with various aircraft icons. A legend at the bottom indicates: Inactive (grey circle), Active Stationary (yellow circle), Active (green circle), Mayday (red circle), Missed Report (blue circle), No GPS (orange circle), Helicopter (green triangle), Fixed Wing (blue triangle), and Ground (yellow triangle). A legend for N972AE shows: Copter Center (green circle), ELakeshore Dr (green circle), Valley Rd (green circle), and N972AE (green circle). Buttons for Alarm, Msg, and Close are visible for N972AE.

At the bottom of the interface, there are two sections: "Missed Reports and Mayday" and "Pending Voice and CDU Messages".

HEMS PART 135 COMPARED TO OTHER CHARTER PART 135 & 121

- A key element to both the pilot on the line and the Operational Control Center is the HEMS Weather Tool.



HEMS WEATHER ACCIDENT STATISTICS

TOM JUDGE



When and Why?

1998-2010



- ◆ OSI-HEMS “Keyword”
 - Human Factors: 94%
 - Weather-related: 25%
 - Mechanical: 24%
 - CFIT: 21%
 - LZ accidents (scenes): 19%
 - Loss of Control: 19%
 - Collision with obstacles: 17%
 - IIMC: 15%
- ◆ NTBS “Undetermined” – 3%



Recent Fatal HEMS Accidents

- *Whittier, AK* – Dec. 3, 2007 – BK117 – 4 fatal
- *Cherokee, AL* – Dec. 30, 2007 – **Bell 206** – 3 fatal
- *S. Padre Island, TX* – Feb. 5, 2008 – **AS350** – 3 fatal
- *La Crosse, WI* – May 10, 2008 – EC135 – 3 fatal
- *Huntsville, TX* – June 8, 2008 – **Bell 407** – 4 fatal
- *Flagstaff, AZ* – June 26, 2008 – **2x Bell 407's** – 7 fatal
- *Greensburg, IN* – Sept. 1, 2008 – **Bell 206** – 3 fatal
- *Forestville, MD* – Sept. 28, 2008 – AS365N1 – 4 fatal
- *Aurora, IL* – Oct. 15, 2008 – Bell 222 – 4 fatal
- *Georgetown, SC* – Sept. 25 2009– **AS350** – 3 fatal
- *Doyle, CA* – Nov. 14, 2009 – **AS350** – 3 fatal
- *El Paso, TX* --Feb. 6, 2010 -- **AS350** – 3 fatal
- *Brownsville, TN*, - 26 March 2010, **AS350** – 3 fatal
- *Midlothian, TX*– 5 June 2010—Bell 222 – 2 fatal
- *Kingfisher, OK*– 22 July, 2010---**AS350**– 2 fatal
- *Tucson, AZ*— 28 July, 2010—**AS350**—3 fatal
- *Scotland, AR*– 31 August, 2010- **Bell 206**– 3 fatal
- *Kearney, MO* –26 August, 2011– **AS350**--- 4 fatal
- *Greenville Springs, FL*– 26 December 2011— **Bell 206** —3 fatal
- *Rochelle, IL*– 11 December 2012-- BK117– 3 fatal
- *Cerro Gordo Cty, IA*, 3 January 2013, **B407**- 3 fatal
- *Oklahoma City, Ok.* 25 February 2013, **AS350**- 2 fatal
- *Manchester, KY*, 6 June 2013, **B206**- 3 fatal
- *Talihina, OK*, 11 June 2013, **AS350**– 1 fatal, 2 critical, 1 injured
- *Somerville TN*, 22 Oct. 2013 **AS350**– 3 fatal

Blue= day time., Orange = night, clear conditions Red = night, marginal weather, low visibility.

With exception of MSP Trooper 2 crash (Forestville, MD) all aircraft operating VFR.



When and Why?

1998-2013



- ◆ Night:
 - 50% of all accidents
 - 67% of all fatal accidents
- ◆ Scenes: 45% of the accidents during patient-related missions



When and Why?

1998-2013



◆ Weather-related accidents

- 25% of all accidents
- Fatal Accidents
 - 58% of weather-related accidents were fatal
(compared to 33% of all accidents having a fatality)



HEMS WEATHER TOOL A HISTORICAL PERSPECTIVE

ERIC LUGGER



HEMS WEATHER TOOL HISTORICAL PERSPECTIVE

- **FAA Weather Summit-Mar 2006**
 - Sponsored by FAA AFS-250 and NCAR
 - Concept-create a graphical gridded weather product for HEMS
- **HEMS Industry Review-May 2006**
 - NCAR development team at Air Evac EMS Communications Center
 - NCAR developed HEMS industry perspective on the HEMS Tool
 - AFS-250 sponsored Advisory Circular-Operational Control Centers

HEMS WEATHER TOOL HISTORICAL PERSPECTIVE

- **Development meeting-NCAR Boulder CO-Sept 2006**
 - Development team brain storming session
 - Initial release of the HEMS Tool
 - Planned enhancements in Phase II release
- **FAA implementation-Nov 2006**
 - Hosted on the NCAR experimental website
 - Same version remains currently-two changes
 - Beta with enhancements will be shown today

HEMS WEATHER TOOL HISTORICAL PERSPECTIVE

- En-route Ceiling and Visibility funding diverted to terminal WX
- Discussions with ATO WX planning-lack of support
- Discussions with AFS WX planning-lack of support
- Discussions with Congressional Staff for Reauthorization bill
- Discussions with NTSB-advocate for HEMS Tool 4 years ago
- Operational version at NSW should be renamed VFR WX Tool
- Helicopter Ops in other sectors use HEMS WX Tool
- Quick onscreen review of current version

HEMS REGULATORY REQUIREMENTS FOR WEATHER

ED STOCKHAUSEN / GERRY PAGANO



GENERAL REQUIREMENTS

- Adequate weather reporting facilities
- Approved sources of weather reports and forecasts to control flight operations
- A system or method of obtaining reports and forecasts of adverse weather phenomena

SOURCES OF WEATHER REPORTING FACILITIES, REPORTS, & FORECASTS

- **U.S. National Weather Service**
 - FAA recognizes NOAA information as equivalent
- **Sources approved by the U.S. National Weather Service**
 - NWS Offices
 - FSS
 - ASOS
 - AWOS
 - SAWRS
 - LAWRS

SOURCES OF WEATHER REPORTING FACILITIES, REPORTS, & FORECASTS (CONT)

- Sources approved by the Administrator
 - NWS for US and territories located outside of the 48 contiguous US
 - US and NATO military observing and forecasting sources
 - Members of the World Meteorological Organization (WMO)
 - Meteorological offices of ICAO subscribing foreign states
 - ICAO member state, authorized meteorological station or automated observation
 - EWINS produced weather products

REPORTS & FORECASTS OF ADVERSE WEATHER PHENOMENA

- Adverse weather or conditions that reduce or threaten safety of operations
 - Thunderstorms
 - Icing
 - LLWS
 - Turbulence
 - Natural Hazards - Volcanic Ash
 - Any Meteorological condition causing contamination of a runway or other takeoff surface and directly effect aircraft performance

SPECIFIC REGULATORY REQUIREMENTS

PART 135

- Sources
 - Part 135.213
 - NWS
 - A source approved by the NWS or
 - A source approved by the Administrator

SPECIFIC REGULATORY REQUIREMENTS

PART 135 (CONT.)

- When the weather report is not available through the sources above there is a stipulation for operations conducted under the Visual Flight Rules
- Pilot in command may use weather information based on his own observations or those of other persons competent to supply those observations

SPECIFIC REGULATORY REQUIREMENTS

PART 135 (CONT.)

- **Reports & Forecasts of Adverse Weather Phenomena**
 - **135.227**
 - Snow or Ice accumulation
 - Flight into known or forecast icing
 - **135.69**
 - Adverse weather reports or forecasts

REGULATORY INTENT

Certificate Holder, PIC, Dispatcher, or Person authorized to exercise Operational Control

- All available weather information when making the decision on whether or not to dispatch, release, or operate (continue) a flight.
 - Worst weather conditions take precedent
- “Current”, “Available” or “Latest”

OTHER REGULATORY REQUIREMENTS

FAR PART 119.5

(g) No person may operate as a direct air carrier or as a commercial operator without, or in violation of, an appropriate certificate and appropriate operations specifications. No person may operate as a direct air carrier or as a commercial operator in violation of any deviation or exemption authority, if issued to that person or that person's representative.

A010 AERONAUTICAL WEATHER DATA

- **Enhanced Weather Information Systems**
EWINS
- **HEMS Tool**
 - “The FAA has authorized the certificate holder to use the experimental ADDS HEMS Tool to support VFR flight planning. The ADDS HEMS Tool controls only in the negative (it is applicable only in the “No-Go” decision). The certificate holder may not conduct flight operations based solely on an indication by the ADDS HEMS Tool that safe conditions have been assessed along the proposed route of flight.”

A021 WEATHER REQUIREMENTS

- **OpSpecs A021**
 - **VFR Minimums Class G airspace all legs**
 - **Table 1**

A021 - VFR WEATHER MINIMUMS

CLASS G AIRSPACE – TABLE 1

Table 1 – Weather Minimums

Area	Non-Mountainous		Mountainous (see 14 CFR 95)	
	Local	Cross Country	Local	Cross Country
Condition	<i>Ceiling-visibility</i>			
Day	800-2	800-3	800-3	1000-3
Night – Equipped with Night Vision Imaging System (NVIS) or Terrain Awareness Warning System	800-3	1000-3	1000-3	1000-5
Night – Without NVIS or TAWS	1000-3	1000-5	1500-3	1500-5

A021 WEATHER REQUIREMENTS (CONT.)

A021

- The certificate holder must use an approved weather reporting source if located within 15 nautical miles from the destination landing area, or use the area forecast if no such weather reporting source is available.

PENDING REGULATIONS

New Regulations 135.607, 609, may be more restrictive

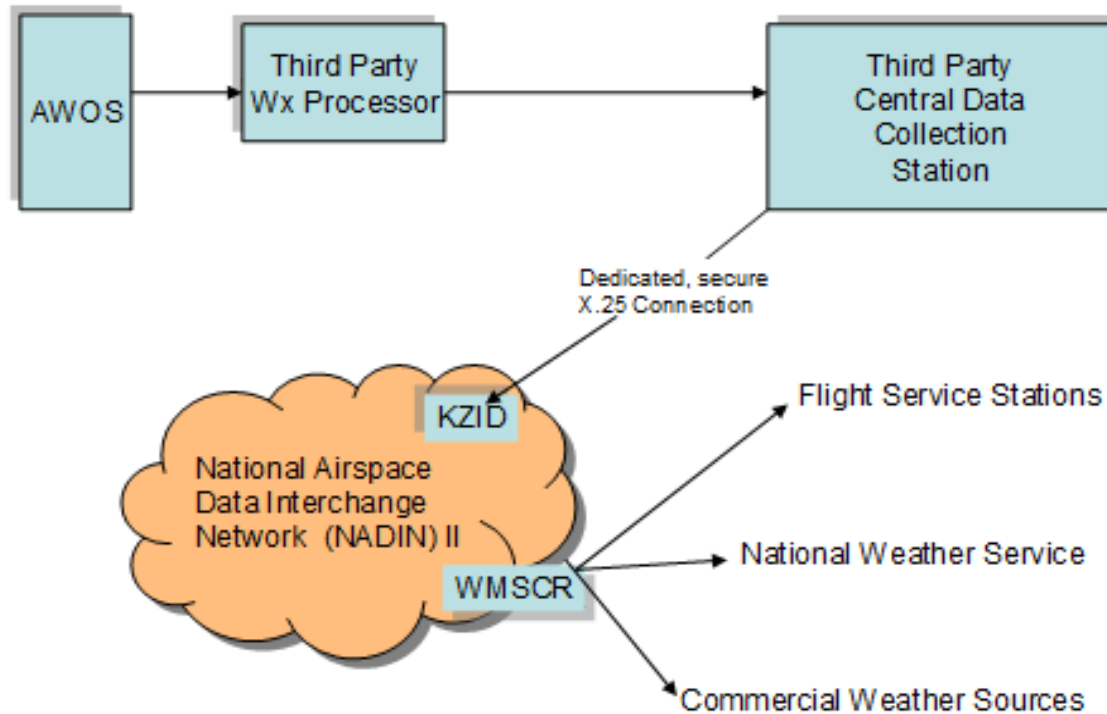
- **IFR Departures in Class G Airspace**
- **Destination WX Reporting within 15 nm and Area Forecast**

WEATHER REGULATIONS, ADVISORY CIRCULARS, LOA'S, MOU'S

TOM JUDGE



WEATHER REGULATIONS, ADVISORY CIRCULARS, LOA's, MOU's



- NADIN: App. 900 stations**
- 80 AWOS
 - 759 ASOS
 - 15 Automated Weather Sensors
 - Airport Terminals

WEATHER REGULATIONS, ADVISORY CIRCULARS, LOA's, MOU's

Non-Federal AWOS

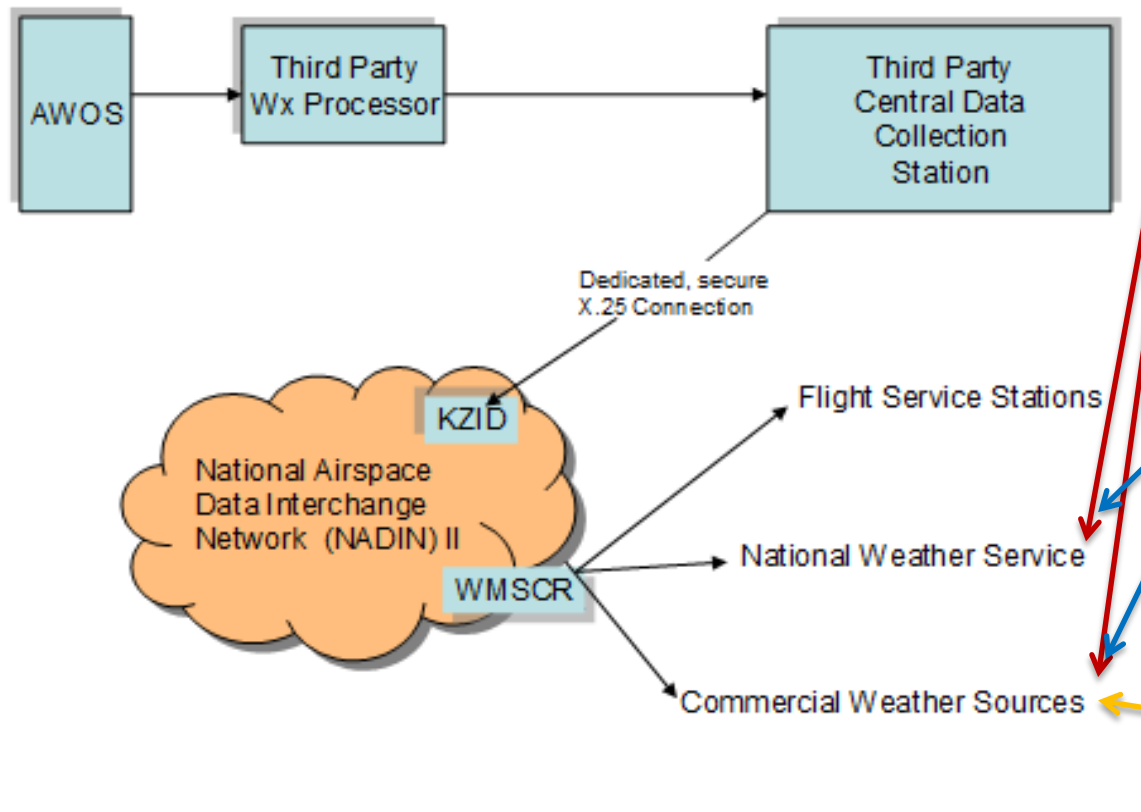
- 1900 +/-
- AWOS IV and III.
- FAA Certified
- FAA Commissioned
- For Part 135 Ops IFR
- Terminal / Other
- Increase 70 per year

DOT: States

- 2400 Environmental
- Sensor Stations and Road Weather Information Systems

Commercial Wx.

- Cameras and Sensors



WEATHER REGULATIONS, ADVISORY CIRCULARS, LOA's, MOU's

Regulatory Issues:

- **Non-Federal Wx. Sources into NADIN**
 - FAA Order 7110.104
 - AC 150-5220-16D
 - FAR 135.213
 - MOU FAA and NOAA/ NWS
 - NASAO MOU
 - Security of Information Exchange
 - Cost

WEATHER REGULATIONS, ADVISORY CIRCULARS, LOA's, MOU's

Regulatory Issues:

- **Non-Federal Wx. Sources into HEMS ADDS**
 - Technically and regulatory possible?
 - NTSB A09-92
 - Enroute weather
 - Security of Information Exchange
 - Cost

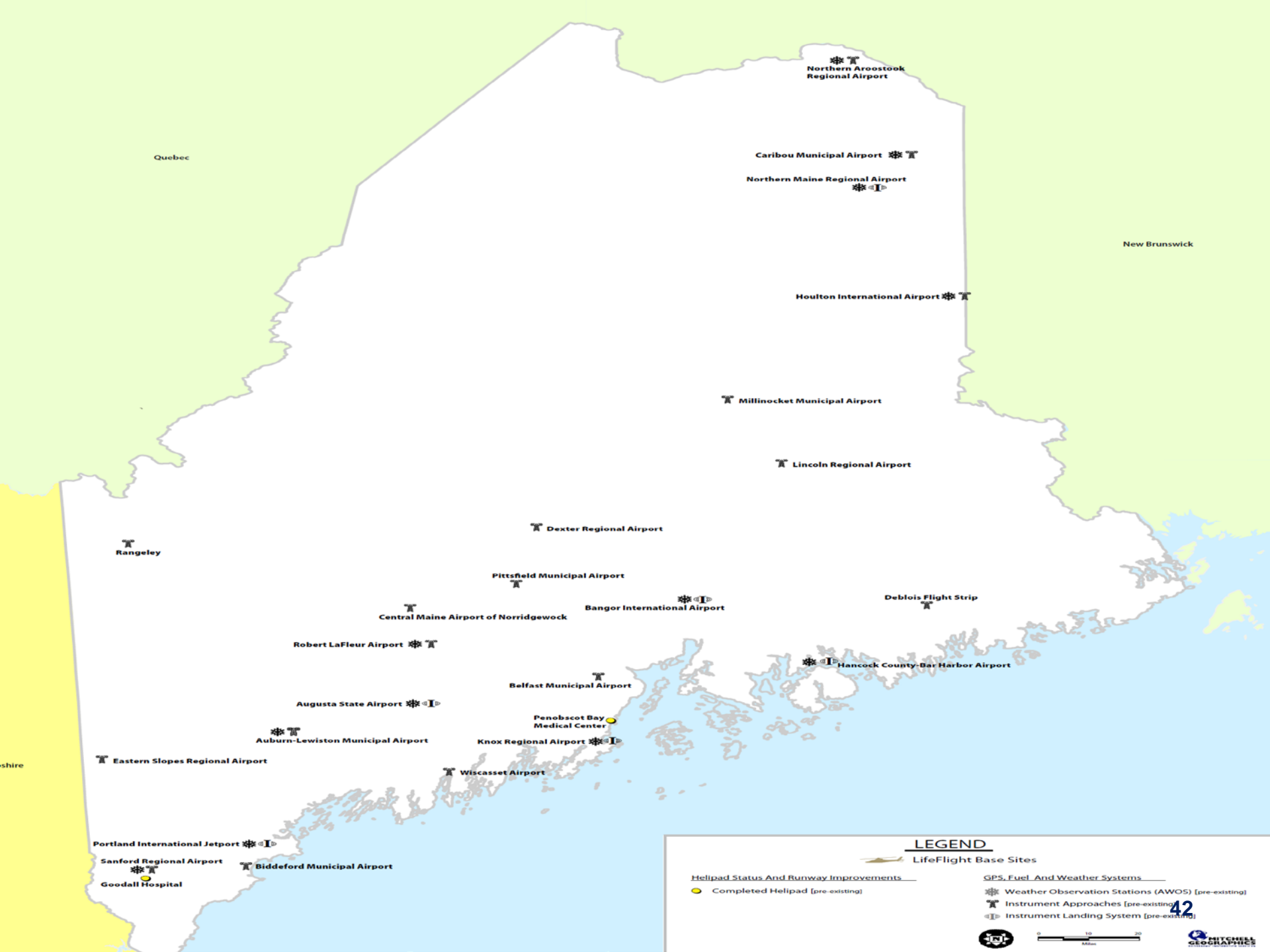
WEATHER REGULATIONS, ADVISORY CIRCULARS, LOA's, MOU's

- AWOS Categories
- AWOS A Altimeter reporting only
- AWOS I Altimeter, Temperature/RH, Wind Speed, Wind Direction
- AWOS II Adds Visibility to an AWOS I
- **AWOS III Adds Ceilometer (cloud height) to an AWOS II**
- AWOS IIIP Adds Present Weather to an AWOS III (current type precip)
- AWOS IIIP/T Adds thunderstorm sensor to an AWOS IIIP
- AWOS IV Adds runway surface temp / freezing rain AWOS IIIP/T.

- AWOS AV Has all the sensors of an AWOS II or AWOS III with only the Altimeter and the Visibility sensor being FAA certified and required for IFR ops

WEATHER REGULATIONS, ADVISORY CIRCULARS, LOA's, MOU's

- Improving Weather
 - Funding
 - Non-Federal Cost Benefit
 - Maintenance
 - FAA Approved
 - FAA Commissioned
- Case Study



Northern Aroostook Regional Airport

Caribou Municipal Airport

Northern Maine Regional Airport

Houlton International Airport

Millinocket Municipal Airport

Lincoln Regional Airport

Dexter Regional Airport

Pittsfield Municipal Airport

Central Maine Airport of Norridgewock

Bangor International Airport

Deblois Flight Strip

Robert LaFleur Airport

Hancock County-Bar Harbor Airport

Augusta State Airport

Belfast Municipal Airport

Penobscot Bay Medical Center

Auburn-Lewiston Municipal Airport

Knox Regional Airport

Eastern Slopes Regional Airport

Wiscasset Airport

Portland International Jetport

Sanford Regional Airport

Biddeford Municipal Airport

Goodall Hospital

LEGEND

LifeFlight Base Sites

Helipad Status And Runway Improvements

Completed Helipad [pre-existing]

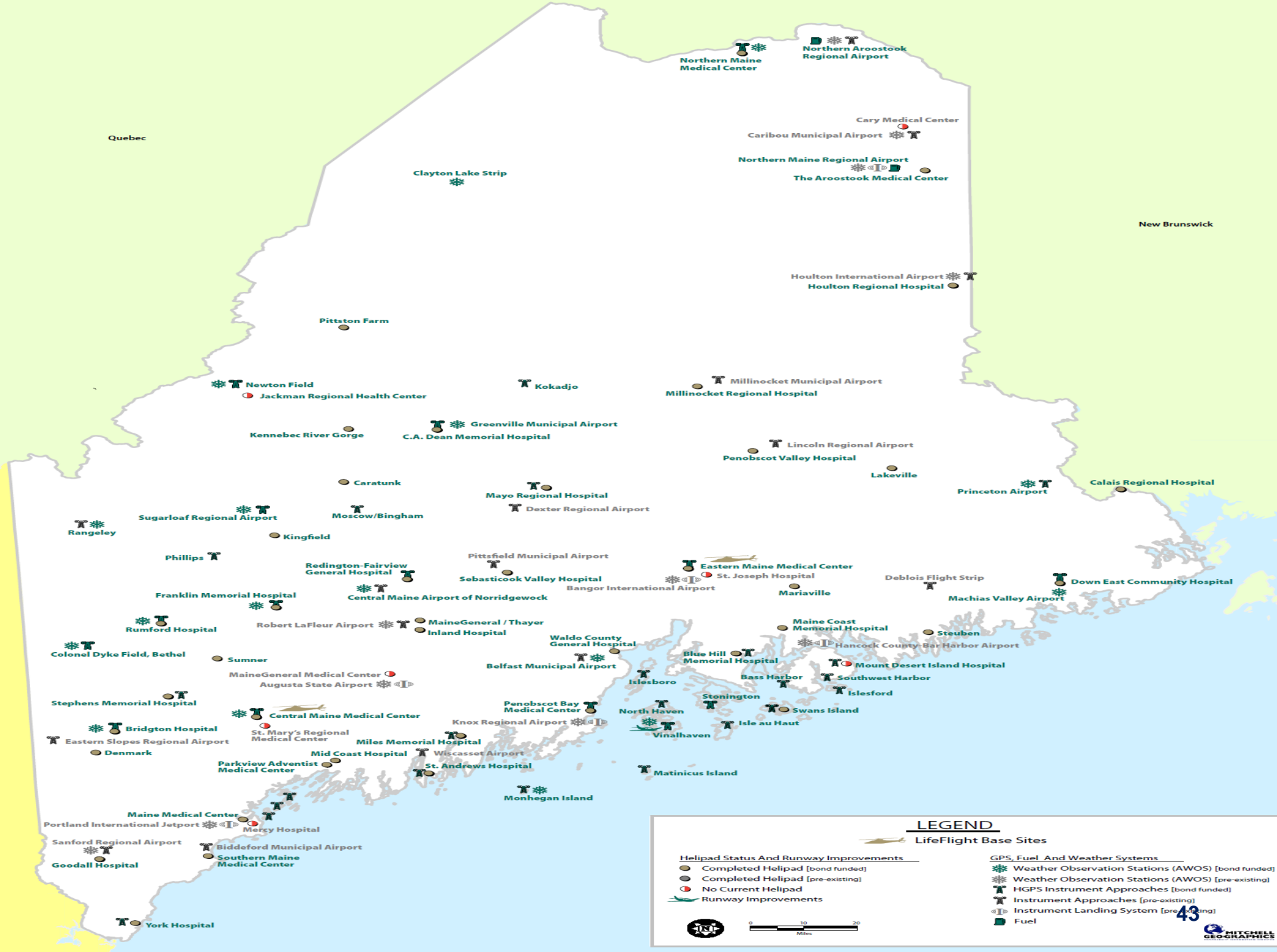
GPS, Fuel, And Weather Systems

Weather Observation Stations (AWOS) [pre-existing]

Instrument Approaches [pre-existing]

Instrument Landing System [pre-existing]





Quebec

New Brunswick

Northern Maine Medical Center

Northern Aroostook Regional Airport

Cary Medical Center

Caribou Municipal Airport

Northern Maine Regional Airport

The Aroostook Medical Center

Clayton Lake Strip

Houlton International Airport
Houlton Regional Hospital

Pittston Farm

Newton Field
Jackman Regional Health Center

Kokadjo

Millinocket Municipal Airport
Millinocket Regional Hospital

Kennebec River Gorge
C.A. Dean Memorial Hospital

Lincoln Regional Airport
Penobscot Valley Hospital

Lakeville

Princeton Airport

Calais Regional Hospital

Caratunk

Mayo Regional Hospital
Dexter Regional Airport

Sugarloaf Regional Airport
Moscow/Bingham

Rangeley

Kingfield

Phillips

Redington-Fairview General Hospital
Pittsfield Municipal Airport

Eastern Maine Medical Center
St. Joseph Hospital

Mariaville

Deblois Flight Strip

Down East Community Hospital

Franklin Memorial Hospital
Central Maine Airport of Norridgewock

Sebasticook Valley Hospital
Bangor International Airport

Mariaville

Machias Valley Airport

Rumford Hospital

Robert LaFleur Airport
MaineGeneral / Thayer Inland Hospital

Waldo County General Hospital

Blue Hill Memorial Hospital

Bass Harbor

Southwest Harbor

Maine Coast Memorial Hospital
Hancock County-Bar Harbor Airport

Steuben

Colonel Dyke Field, Bethel

Sumner
MaineGeneral Medical Center
Augusta State Airport

Belfast Municipal Airport

Islesboro

Stonington

Swans Island

Mount Desert Island Hospital

Stephens Memorial Hospital

Central Maine Medical Center
St. Mary's Regional Medical Center

Miles Memorial Hospital

Wiscasset Airport

North Haven

Vinalhaven

Isle au Haut

Bridgton Hospital
Eastern Slopes Regional Airport
Denmark

Parkview Adventist Medical Center
Mid Coast Hospital

St. Andrews Hospital

Monhegan Island

Matinicus Island

Maine Medical Center
Portland International Jetport
Sanford Regional Airport

Biddeford Municipal Airport
Southern Maine Medical Center

Goodall Hospital

Mercy Hospital

York Hospital

LEGEND

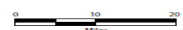
LifeFlight Base Sites

Helipad Status And Runway Improvements

- Completed Helipad [bond funded]
- Completed Helipad [pre-existing]
- No Current Helipad
- Runway Improvements

GPS, Fuel, And Weather Systems

- Weather Observation Stations (AWOS) [bond funded]
- Weather Observation Stations (AWOS) [pre-existing]
- HGPS Instrument Approaches [bond funded]
- Instrument Approaches [pre-existing]
- Instrument Landing System [pre-existing]
- Fuel



ECONOMIC IMPACT OF THE HEMS WEATHER TOOL

CHRIS EASTLEE



ECONOMIC IMPACT OF THE HEMS WEATHER TOOL

HEMS Industry Data Points

- Transported more than 298,000 patients in 2011.
- Directly employs 18,000 people
- Approximately 1,000 helicopters
- \$3.4 Billion per year industry
- Over \$900 Million on safety improvements since 2006

ECONOMIC IMPACT OF THE HEMS WEATHER TOOL

HEMS Industry OCC's and Weather

- HEMS Operational Control Centers (OCC's) direct aircraft dispatch, provide pilot information-
weather most critical.
- All HEMS OCC's use the Weather Tool
- Cost of OCC's exceed \$13 Million per year
- Weather reporting impacts as many as 20% of air medical flights (~\$680 Million)

ECONOMIC IMPACT OF THE HEMS WEATHER TOOL



ECONOMIC IMPACT OF THE HEMS WEATHER TOOL

HEMS Industry Data Points

- 298,000 patients transported in 2011
- Estimate 363,896 total flight hours in 2011
- Estimate 40%-60% of patient flight request turndown rate (of those, as many as 80% may be due to weather)
- Approximately 20% of REQUESTS may end in “aborts” in which the aircraft took off and turned back due to weather; those do not result in a patient transport and are not included in patient transport total.

ECONOMIC IMPACT OF THE HEMS WEATHER TOOL

HEMS Industry Weather Aborts

- Weather Aborts increase risk, interrupt patient transport
- Frequency of these aborts can dramatically decrease with better, more accurate weather
- The lost economic value of these transports is hard to estimate, but the impact on safety and the medical system (as the patient is not transported) is profound.
- An enhanced HEMS Weather Tool used as a “legal” weather source can greatly reduce these events.

ECONOMIC IMPACT OF THE HEMS WEATHER TOOL

HEMS Industry Data Points

- NTSB cites weather as causal factor in 11 fatal accidents involving 34 fatalities from 2007 to 2013.
- DOT Value of Statistical Life (VSL) for 2012 is \$9.1 Million. $34 \times \$9.1 = \309 Million

HEMS WEATHER TOOL FOR OTHER AVIATION OPERATIONS

J HEFFERNAN



HEMS WEATHER TOOL FOR OTHER AVIATION OPERATIONS

- HAI currently recognizes 28 commercial helicopter uses in addition to HEMS
 - From Oil and Gas to Livestock Management
 - In both Urban and Wilderness scenarios
 - Many performed in joint operations with or in direct support of Fixed Wing Aircraft

HEMS WEATHER TOOL FOR OTHER AVIATION OPERATIONS

- The HEMS tool provides:
 - Specific localized weather.
 - The ability to study surrounding area weather and projected weather.
 - Creates a “Sense of the weather” mindset.
 - Allows the pilot to “use” the weather rather than “fight” the weather.

HEMS WEATHER TOOL FOR OTHER AVIATION OPERATIONS

***USABLE WEATHER INFORMATION FOR
A HELICOPTER IS BY LOGICAL
EXTENSION USABLE WEATHER
INFORMATION FOR A FIXED WING
AIRCRAFT***

HEMS WEATHER TOOL FOR OTHER AVIATION OPERATIONS

- **Currently the major limitation for the HEMS Weather Tool is INPUT**
 - Many excellent sources of information already exist
 - AWOS, Law Enforcement, Interstate Highway System, Railroads
 - Potential to add an acceptable reporting system at VOR sites
 - Increase types of weather approved by NWS to gain acceptance by FAA Administrator

HEMS WEATHER TOOL FOR OTHER AVIATION OPERATIONS

- Based on 7+ years of usage

– *Move the HEMS Weather Tool from Experimental status to full support by NWS*

HEMS WEATHER TOOL INPUT DATA

REX ALEXANDER



HEMS WEATHER TOOL INPUT DATA

- **Weather Interpretation and the Gestalt Effect.**
 - Pilots interpret weather information differently, based on:
 - Experience
 - Training
 - Education
 - Mood
 - Internal Pressures
 - External Pressures
 - Equipment



HEMS WEATHER TOOL INPUT DATA

The HEMS Weather Tool helps cut through pilot misinterpretation.

KAID 152047Z 26010G20KT 10SM OVC048 M07/M12 A3004=
KANQ 152155Z AUTO 25010KT 10SM FEW025 OVC029 A2994 RMK=
KANQ 152135Z AUTO 26010KT 10SM OVC029 A2993 RMK=
KANQ 152115Z AUTO 26012KT 10SM OVC027 A2993 RMK=
KANQ 152055Z AUTO 26013KT 220V290 10SM OVC027 A2992 RMK=
KASW 152155Z AUTO 26012KT 10SM BKN070 OVC090 M09/M12 A3001
RMK AO2=
KASW 152135Z AUTO 26012G17KT 10SM SCT060 SCT075 BKN090
M09/M13 A3000 RMK AO2=
KASW 152115Z AUTO 25011KT 10SM OVC060 M09/M13 A2999 RMK AO2=
KASW 152055Z AUTO 26014KT 10SM OVC060 M08/M13 A2998 RMK AO2=
KBAK 152145Z 26008KT 10SM OVC070 M03/M07 A3009=
KBAK 152045Z 24011KT 10SM SCT047 OVC070 M03/M06 A3009=
KBMG 152153Z 25009KT 7SM SCT018 OVC070 M04/M08 A3009 RMK AO2
SLP198 T10391078=
KBMG 152127Z 26009KT 7SM BKN017 OVC065 M04/M08 A3009 RMK AO2
T10391078= (SPECI)
KBMG 152053Z 25010KT 8SM OVC070 M04/M08 A3007 RMK AO2 SLP192
T10391083 56002=
KEKM 152150Z 25011KT 4SM -SN OVC027 M09/M13 A2999 RMK AO2=
KEKM 152050Z 24012G16KT 5SM -SN OVC023 M08/M13 A2997 RMK AO2=
KEVV 152154Z 23007KT 10SM OVC019 M01/M05 A3017 RMK AO2 SLP219
T10111050=

Additional data points help fill in the blanks for offsite locations where HEMS pilots operate.



HEMS WEATHER TOOL INPUT DATA

- **Indiana, a case study**

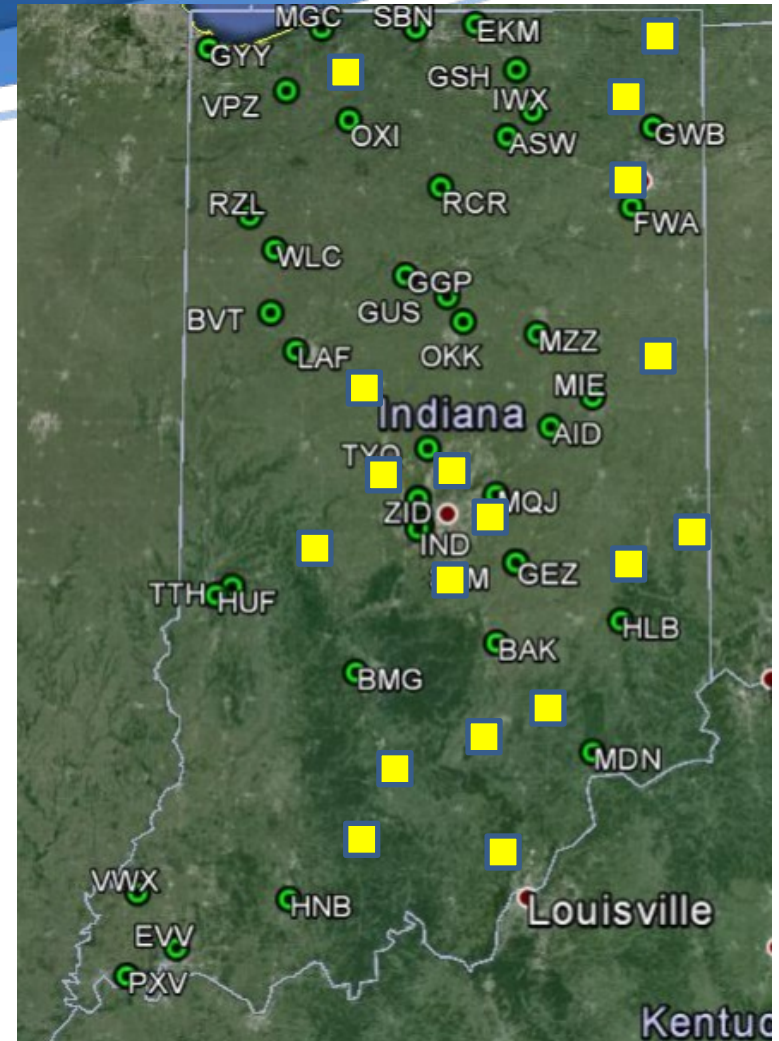
- **AWOS & ASOS Sites reporting into the HEMS Weather System.**

- **Current**

- **Potential**

- **Source**

- HEMS Weather Tool
 - Airport Directory



HEMS WEATHER TOOL INPUT DATA

- The Low Hanging Fruit
 - Example: Indiana
 - FAA Airport Facilities Directory
- Compiled: 05/08/2012

37	11	27	26	29	39	29
AWOS-III	ASOS	NOAA	HEMS Tool	Any AWOS	DUAT	UCAR List
48						

Weather Reporting Web Sites

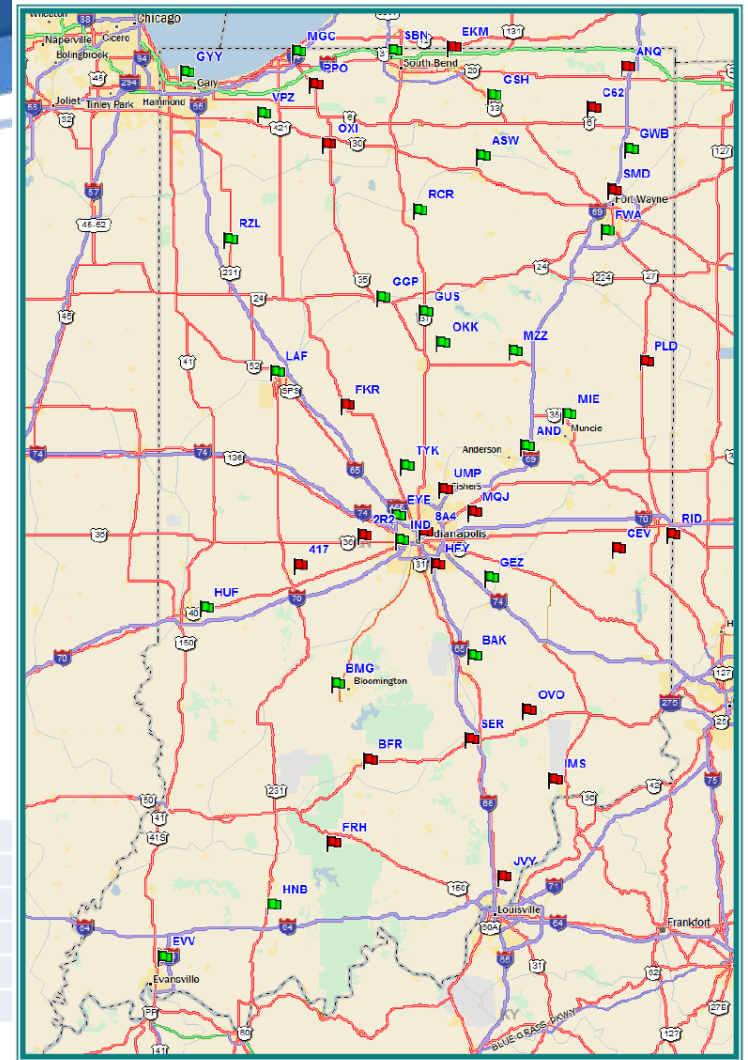
NOAA AWOS Map: <http://www.wrh.noaa.gov/zoa/mwmap3.php?map=usa>

HEMS Weather Tool: <http://weather.aero/tools/desktopapps/hemstool>

Any AWOS: <http://www.anyawos.com/>

DUAT: <https://www.duat.com/>

UCAR Surface Stations: <http://weather.rap.ucar.edu/surface/stations.txt>



HEMS WEATHER TOOL INPUT DATA

- **D.O.T. Road Weather Sensors**

 Weather Station

 Weather Station w/Camera

- Air Temperature
- Humidity
- Dew Point
- Wind Speed
- Wind Gust
- Wind Direction



HEMS WEATHER TOOL INPUT DATA

- **RAWS** – Remote Automatic Weather Stations
 - <http://raws.fam.nwcg.gov/index.html>
- **ROMAN** – Real time Observation Monitor and Analysis Network.
 - <http://raws.wrh.noaa.gov/roman/>
 - Indiana has 8 RAWS sites

HEMS WEATHER TOOL INPUT DATA

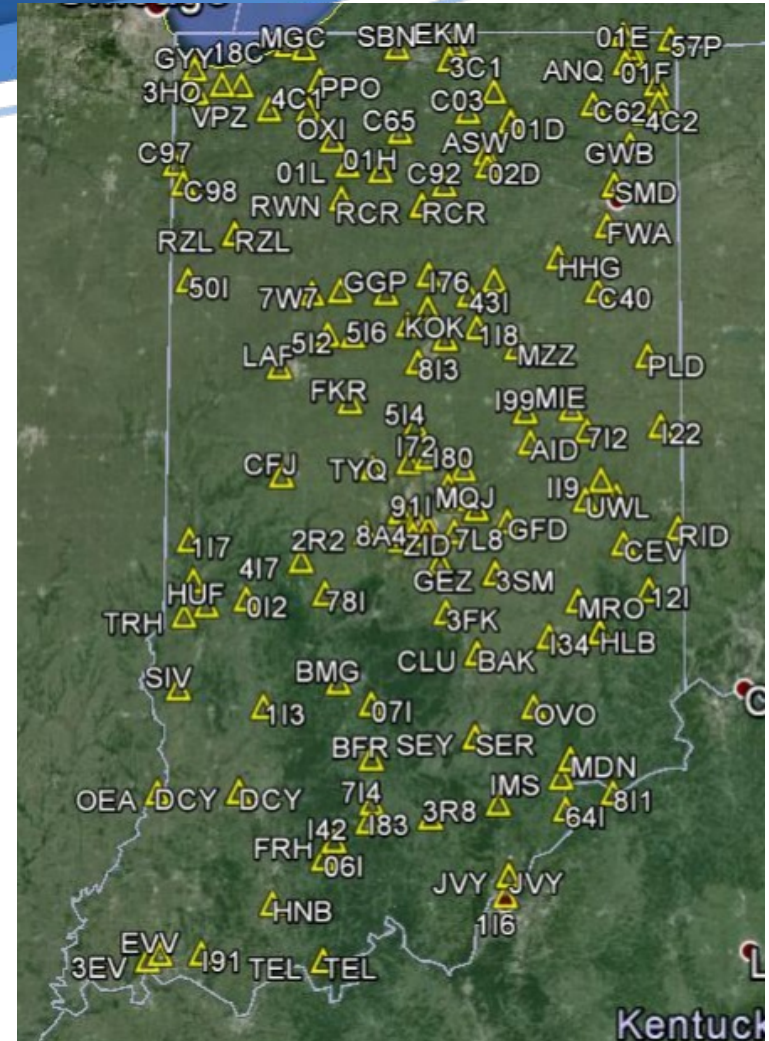
- Potential Weather Reporting Sites

147

– Source

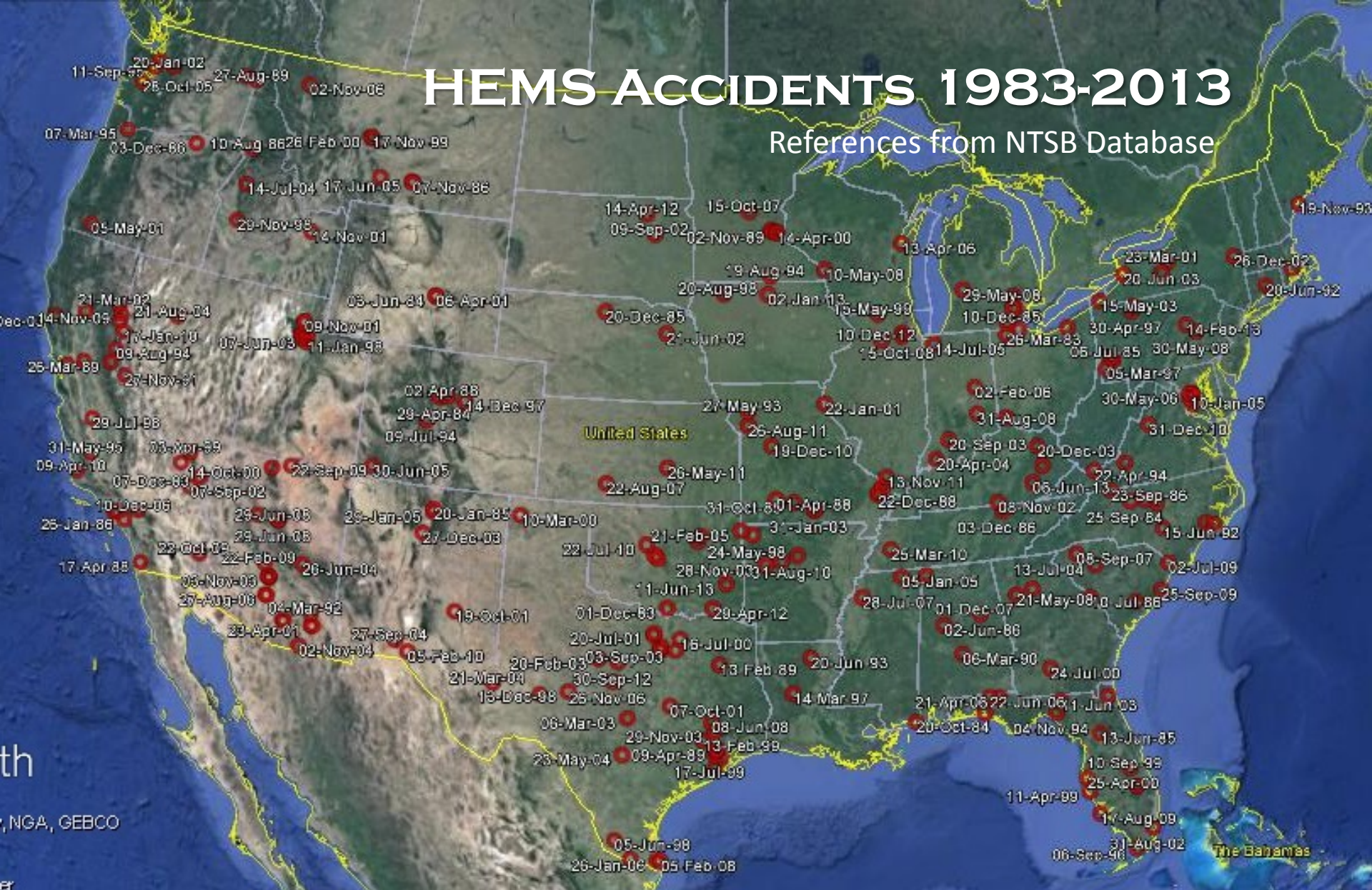
- Weather Graphics

<http://www.weathergraphics.com/identifiers/>



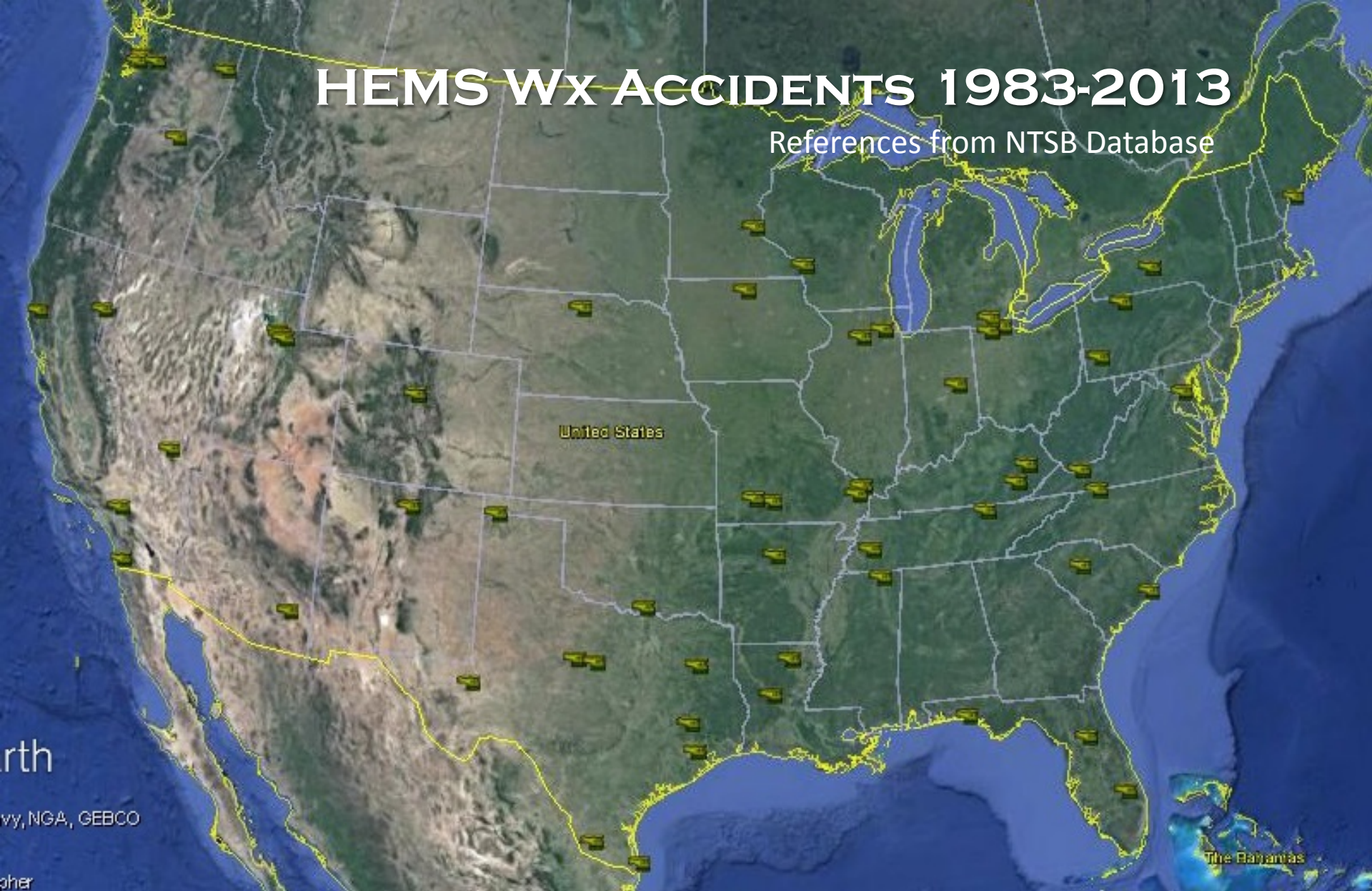
HEMS ACCIDENTS 1983-2013

References from NTSB Database



HEMS WX ACCIDENTS 1983-2013

References from NTSB Database



CONCLUSION

- The HEMS Wx Tool has been embraced by every HEMS pilot with open arms and has become an integral part of their weather decision making.
- Multiple aviation entities, rotor and fixed, have also embraced the HEMS Wx Tool for weather reporting below 5,000’.
- Numerous non-aviation agencies have discovered and are now using the HEMS Wx Tool for many diversified applications.

RECOMMENDATIONS

- Fully fund the final development of the HEMS ADDS weather reporting system.
- Move the HEMS Weather Tool from experimental to operational.
- Increase the density of weather stations reporting into the HEMS Weather Tool.
- Construct in-cockpit access for the HEMS Weather Tool.

QUESTIONS



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