

HEMS WEATHER TOOL

SAVING LIVES ONE FLIGHT AT A TIME

NBAA

FRIENDS AND PARTNERS OF AVIATION WEATHER

ORLANDO, FLORIDIA

OCTOBER 23, 2014

Presented By: Rex Alexander, National EMS Pilots Association



HEMS ACCIDENTS 1983-2013

References from NTSB Database

Total Accidents: 247

HEMS WX ACCIDENTS 1983-2013

References from NTSB Database

Weather Related Accidents: 61 (25%)

HEMS WX ACCIDENTS 1983-2013

References from NTSB Database

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HEMS WX ACCIDENTS 1983-2013

References from NTSB Database

Weather Related Accidents: 61 (25%)

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%



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)

Ref: Dr. Ira Blumen (for AMTC 2013, Virginia Beach)



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 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

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

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
 - 7days-on shift / 7days-off shifts
 - With day night rotations
 - A local area with a 25-50 nm radius.
 - A service areas with a 150 nm 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

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

| | Non-Mountainous | | Mountainous (see 14 CFR 95) | |
|--|--------------------|---------------|--------------------------------|---------------|
| | Local | Cross Country | Local | Cross Country |
| Condition \ Area | Ceiling-visibility | | | |
| 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

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.

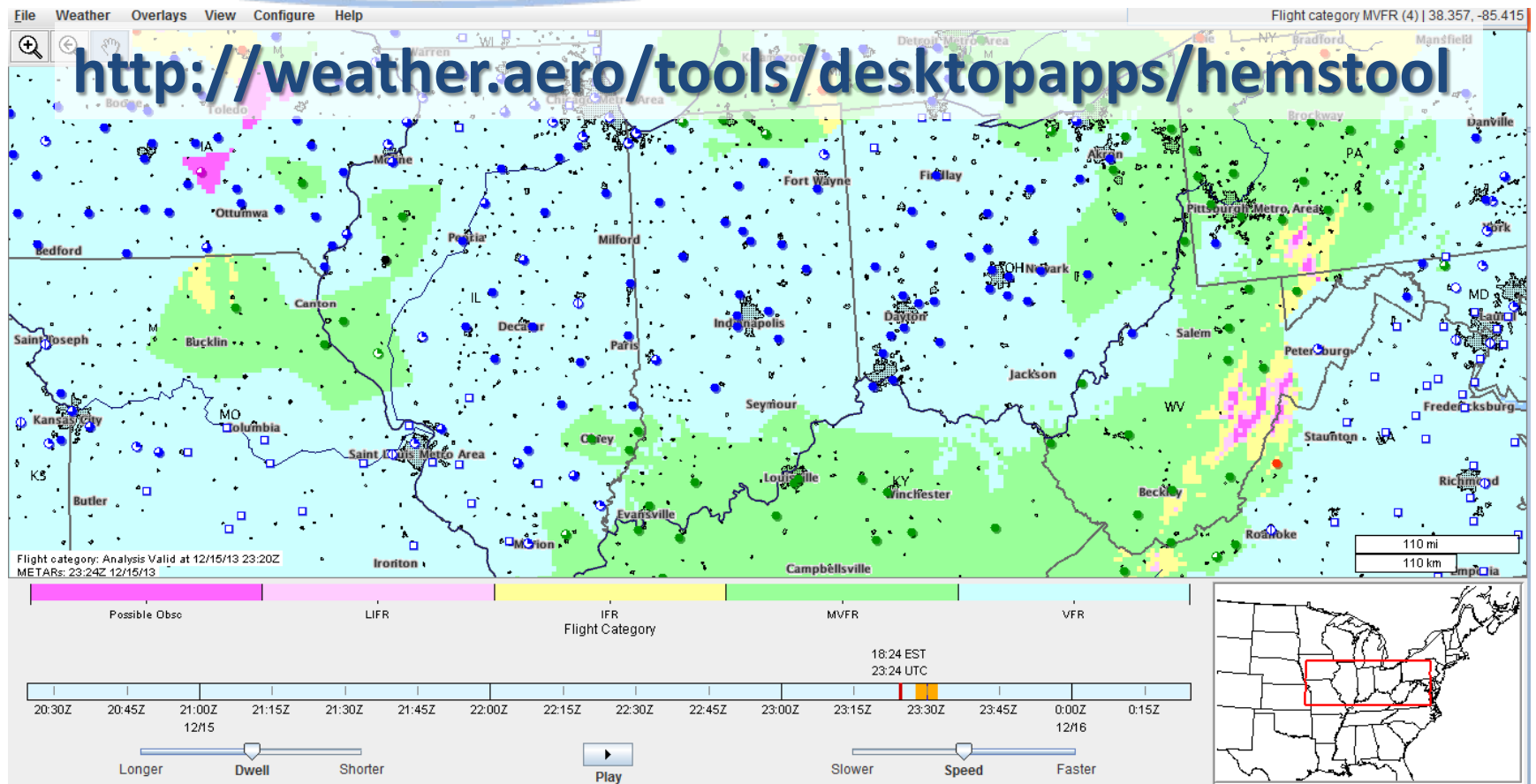
HEMS WEATHER TOOL HISTORICAL PERSPECTIVE

- **Mar 2006: FAA Weather Summit**
 - Sponsored by FAA AFS-250 and NCAR
 - Concept-create a graphical gridded weather product for HEMS
- **May 2006: HEMS Industry Review**
 - 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

- **Sept 2006: Development meeting-NCAR Boulder CO**
 - Development team brain storming session
 - Initial release of the HEMS Tool
- **Nov 2006: FAA implementation**
 - Hosted on the NCAR experimental website
 - Same version remains currently-two changes

HEMS WEATHER TOOL HISTORICAL PERSPECTIVE



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.”*

HEMS WEATHER TOOL HISTORICAL PERSPECTIVE

- Dec 2013 / 7 Years Later

HEMS Weather Summit in Washington, D.C.

- 42 Total Individuals
- 15 From the FAA (*13 different divisions*)
- 12 From the HEMS and Helicopter Industry

FAA, NCAR, NOAA, NTSB, NEMSPA, ACCT, AMOA, HAI, IHST, AAMS, USCG

NEW HEMS WX TOOL

[HTTP://NEW.AVIATIONWEATHER.GOV/HEMST](http://new.aviationweather.gov/hemst)



AVIATION WEATHER CENTER

NOAA NATIONAL WEATHER SERVICE

EXPERIMENTAL

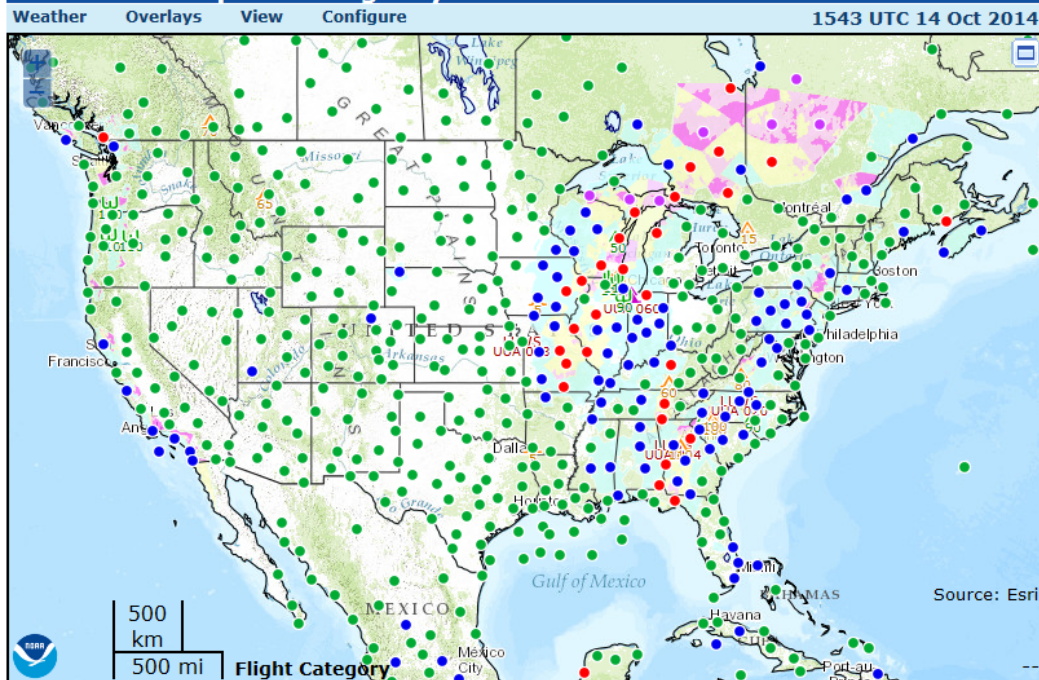
Local Forecast

Go

HOME ADVISORIES FORECASTS OBSERVATIONS TOOLS NEWS SEARCH ABOUT USER

Helicopter Emergency Medical Services Tool

INFO Feedback



Obscure LIFR IFR MVFR

WEATHER INTERPRETATION

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



NEED FOR ADDITIONAL DATA

The HEMS Weather Tool helps cut through pilot misinterpretation.

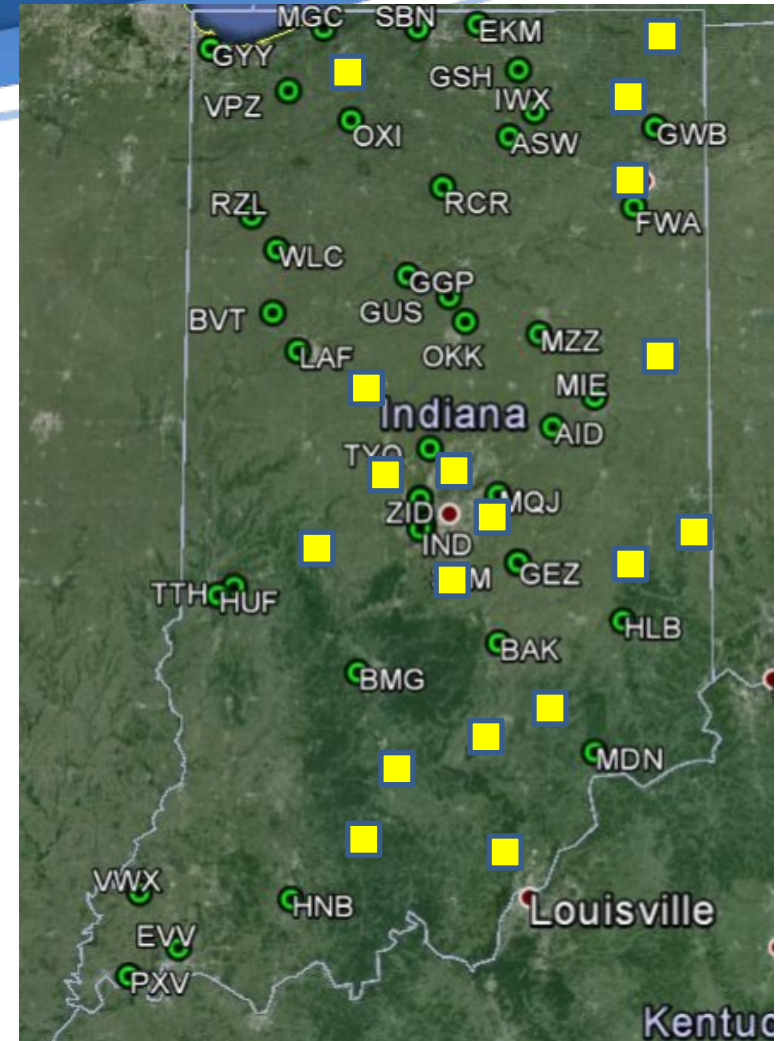
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KANQ 152155Z AUTO 25010KT 10SM FEW025 OVC029 A2994 RMK=
KANQ 152135Z AUTO 26010KT 10SM OVC029 A2993 RMK=
KANQ 152115Z AUTO 26012KT 10SM OVC027 A2993 RMK=
KANQ 152055Z AUTO 26013KT 220V290 10SM OVC027 A2992 RMK=
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M09/M13 A3000 RMK AO2=
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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.



INCREASING HEMS WEATHER TOOL INPUT DATA

- Case Study
 - Indiana AWOS & ASOS Sites reporting into the HEMS Weather System.
 - Current
 - Potential
 - Source
 - HEMS Weather Tool
 - Airport Directory



INCREASING 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

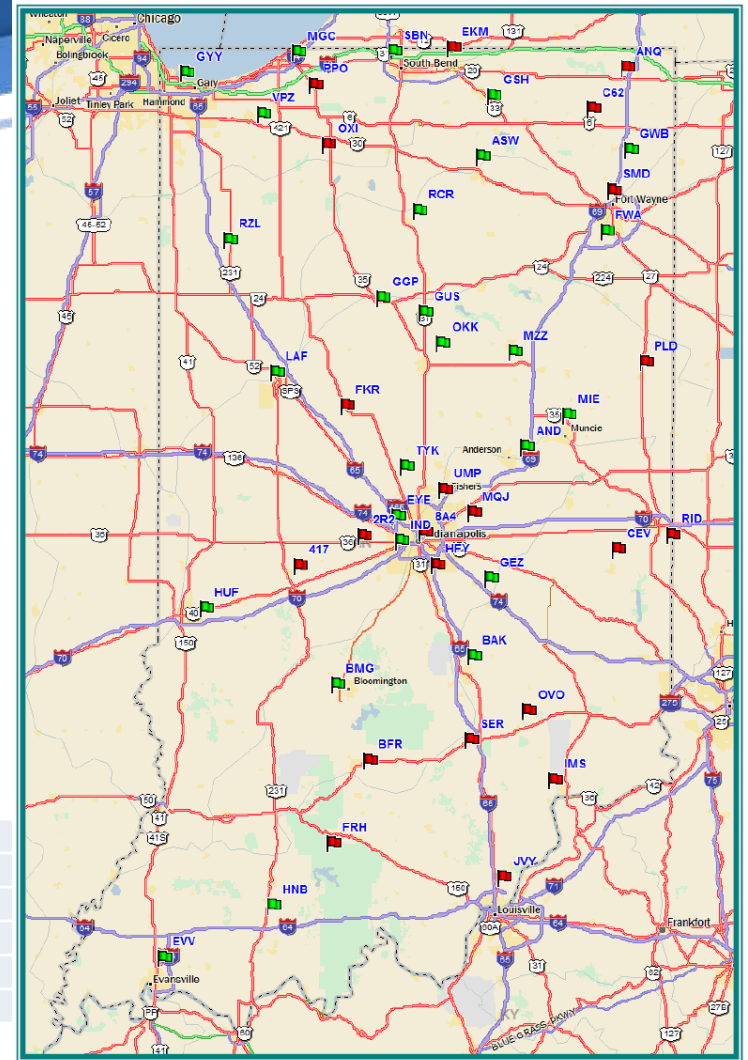
NOAA AWOS Map: <http://www.wrh.noaa.gov/zoa/mwmap3.php?map=usa>

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>



INCREASING HEMS WEATHER TOOL INPUT DATA

- D.O.T. Road Weather Sensors
- Indiana has 29

▲ Weather Station

▲ Weather Station w/Camera

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



INCREASING HEMS WEATHER TOOL INPUT DATA

- **RAWS – Remote Automatic Weather Stations**
 - Indiana has 8 RAWS Sites
 - *“There are nearly 2,200 interagency Remote Automatic Weather Stations (RAWS) strategically located throughout the United States.”*
 - <http://raws.fam.nwcg.gov/index.html>



INCREASING HEMS WEATHER TOOL INPUT DATA

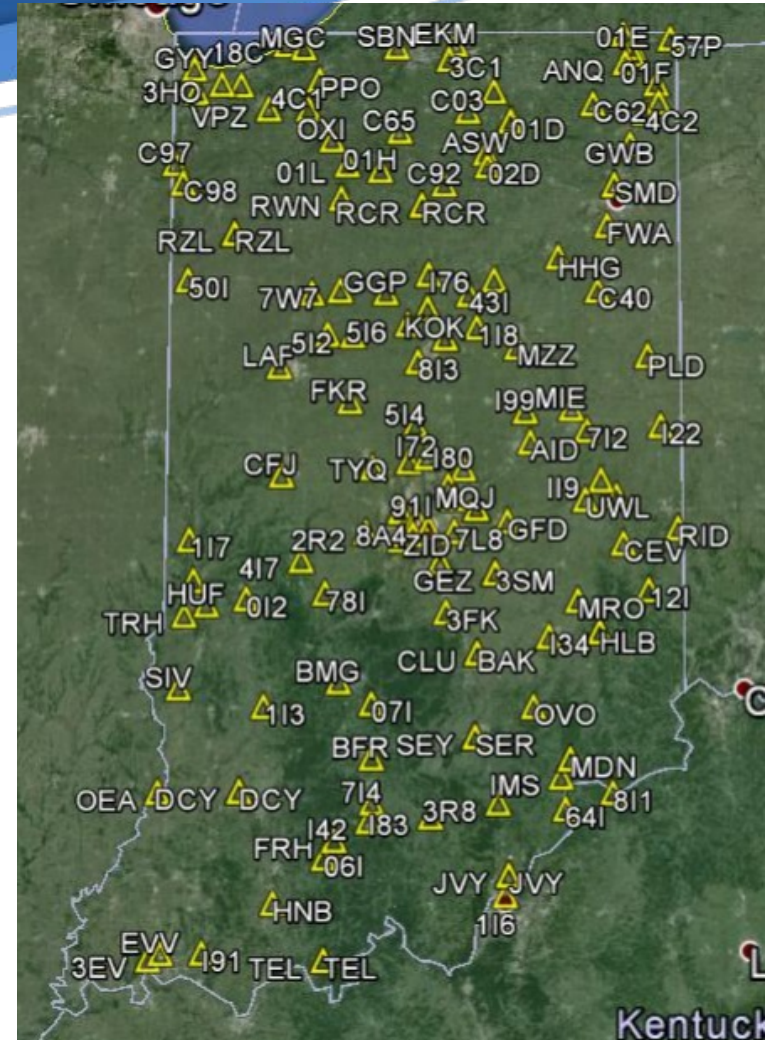
- Potential Weather Reporting Sites

147 vs. 26

— Source (Dec 2013)

- Weather Graphics

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



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 to the HEMS Weather Tool.

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QUESTIONS