AVIAN HAZARD ADVISORY SYSTEM (AHAS) TRAINING

A H A S
Avian Hazard Advisory System

Florida : California : Hawaii : Calgary : London : Bejing
www.detect-inc.com www.dronewatcher.com

OBJECTIVE

- Introduce users to the AHAS system by highlighting specific capabilities, common pitfalls, and best practices

OVERVIEW

- Outputs
  - Current Conditions (current hour query)
  - Forecast Conditions (>1 and ≤ 24 hrs query)
  - Historical Conditions (> 24 hr query)
  - Risk Summary
- Common Misunderstandings
- Best Practices

AHAS

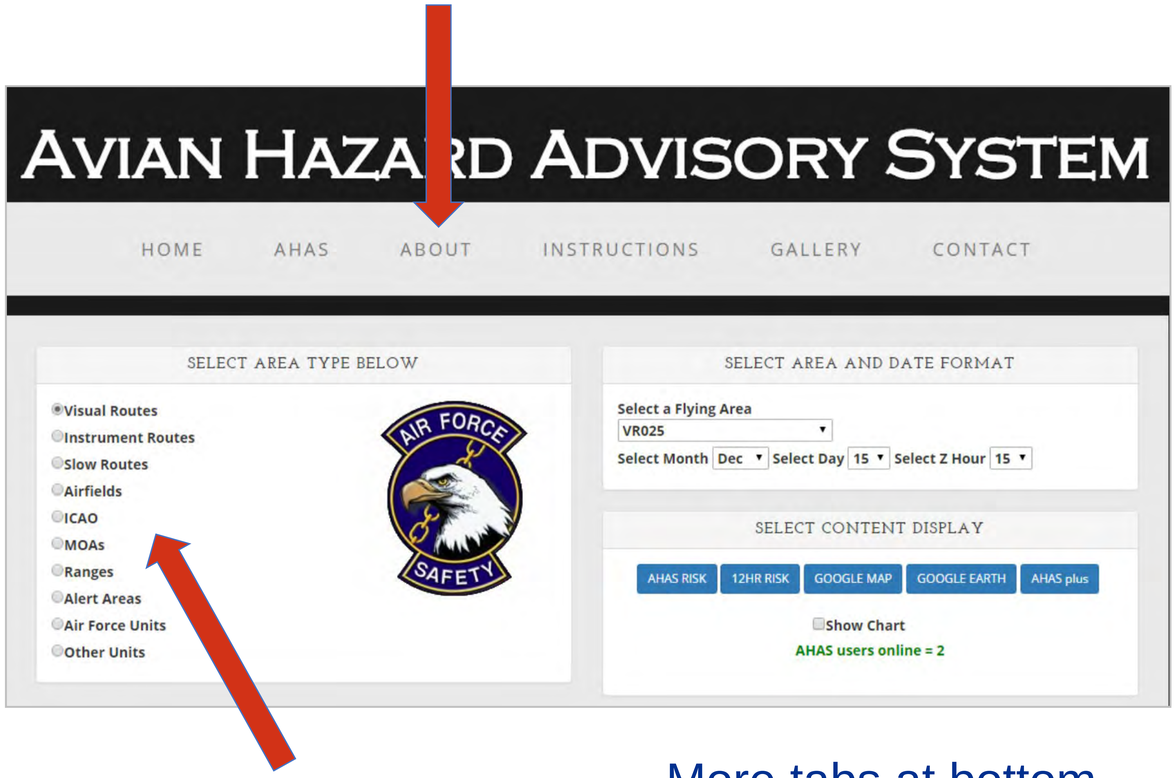
- Predicts bird movements within low level flight arena for the contiguous 48 states and Alaska
- Found at https://www.usahas.com
- Uses Level 2 NEXRAD data, National Weather Service (NWS) Forecasts, Soaring Bird Forecast Models, and the Bird Avoidance Model (BAM) to predict bird movements
- Provides CONUS and Alaska bird strike risk for:
  - IR, VR, and SR routes
  - Ranges and MOA's
  - Some Military and Civilian Airfields
  - Alert Areas

OUTPUTS

- If you request information for:
  - **Current Hour:** risk is based on observations made by the NEXRAD weather radar system, data from the Soaring Model or from the US BAM
  - **Less Than 24 hrs (>1 and ≤ 24 hrs query):** risk is based on the Soaring Model or the US BAM. These models forecast conditions favorable for hazardous bird activity to be present
  - **More Than 24 hrs, or historical (> 24 hour query or past conditions):** risk information comes from the current version of the US BAM

AHAS MAIN QUERY PAGE

AHAS web page tabs

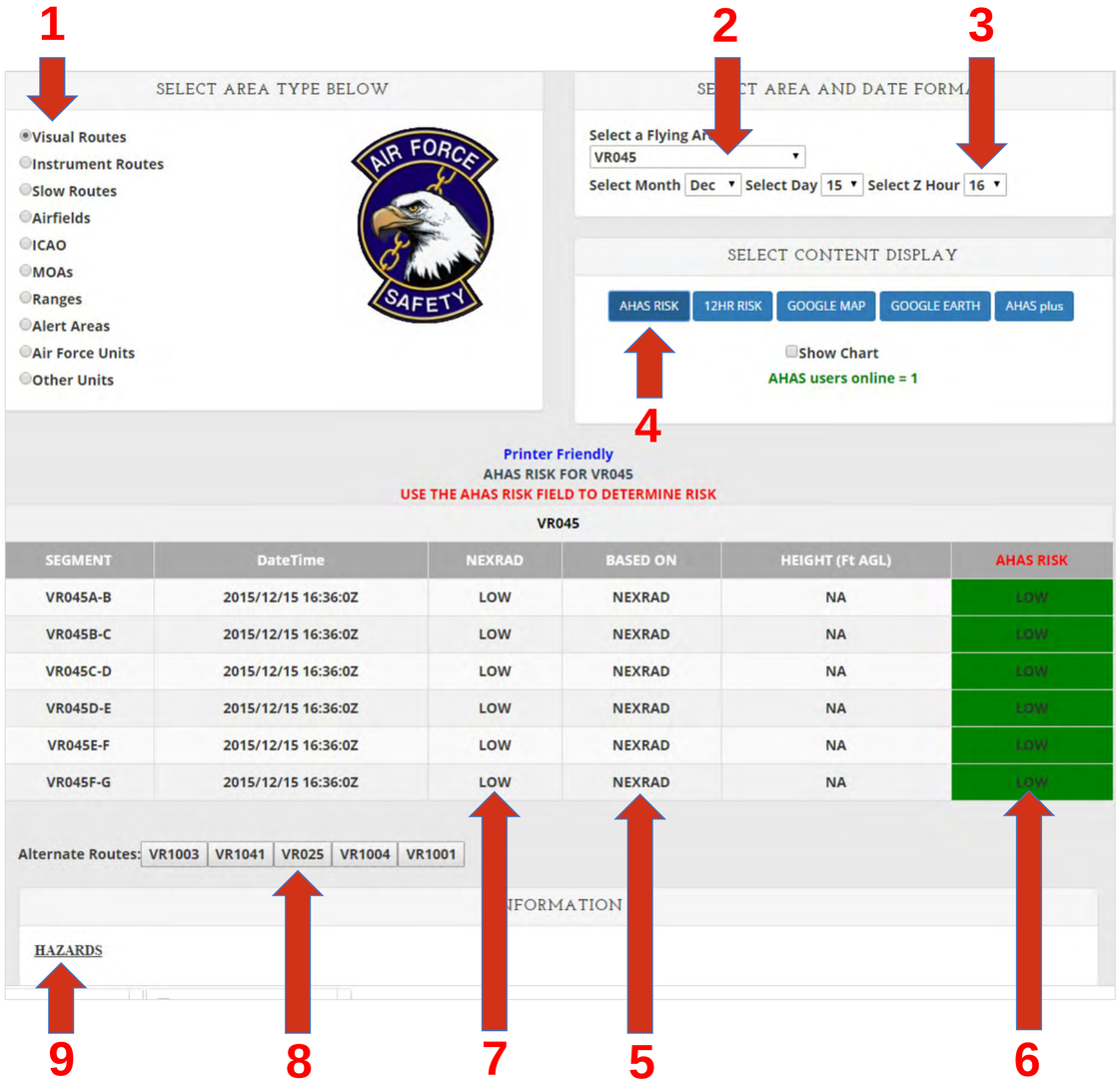


Output selection and chart option

More tabs at bottom

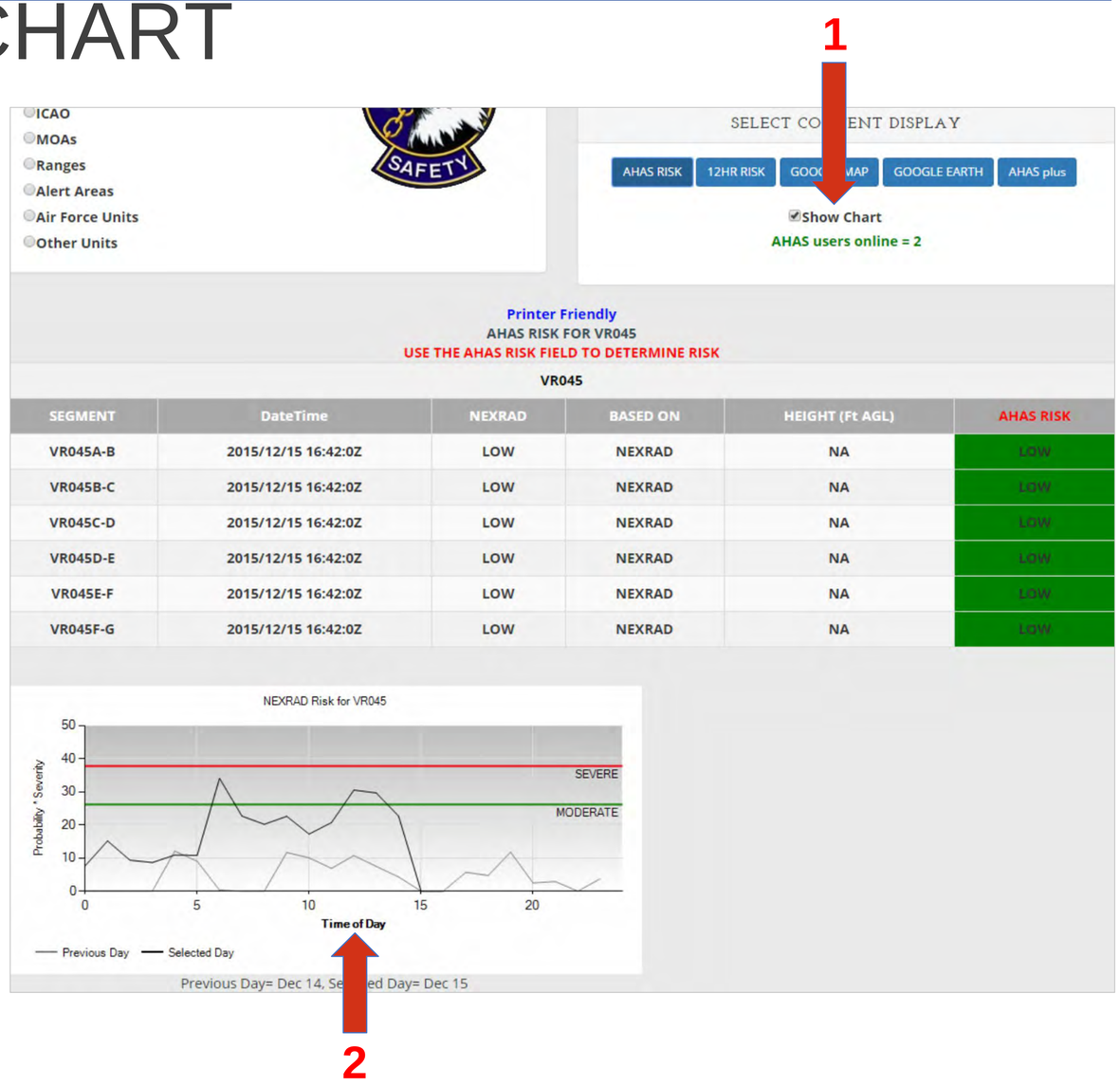
- AHAS immediately directs you to the query page. Check for news and other important information using the tabs at the top
- AHAS allows you to select airfields based on the ICAO
- To request a new unit specific page, contact the USAF BASH Team
- You can also select output type

TABLE OUTPUT



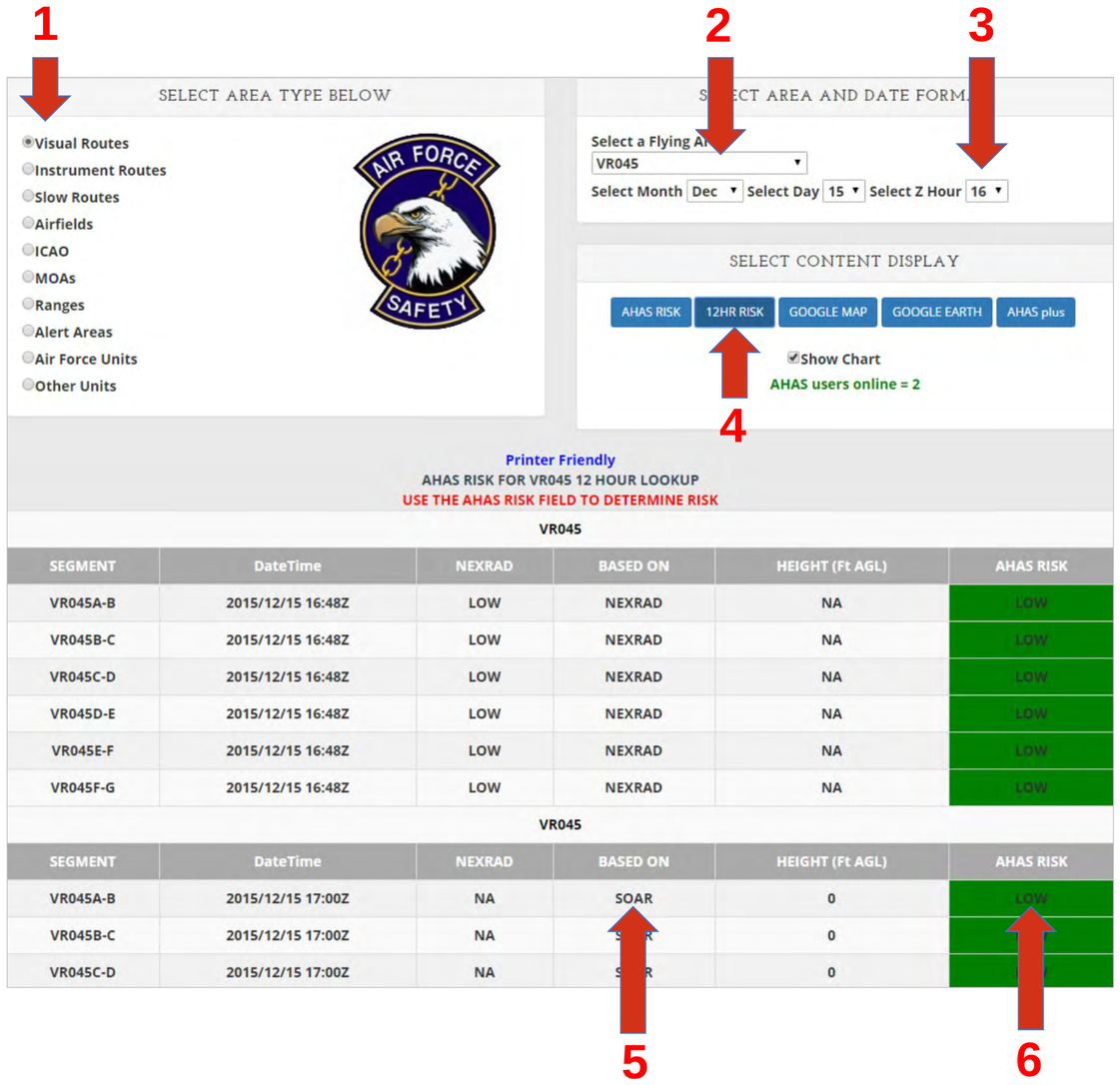
- Search Criteria: VR 045 (**1, 2**), current hour in Zulu (**3**), output choice, AHAS RISK (**4**)
- AHAS indicates the driving model (**5**) for the overall risk (**6**), which is color coded based on risk
- The results from NEXRAD will always be shown for the current hour(**7**)
- AHAS also shows the nearest five other routes(**8**)
- AHAS shows hazards found along the route, including dams, golf courses, and landfills(**9**)
- The web page updates every 6 minutes when the data is updated in the database.

TABLE OUTPUT WITH CHART



- Check the show chart box to display the NEXRAD data chart (**1,2**).
- The chart shows the maximum NEXRAD risk for the selected flying area for each hour. Due to the high dynamic range of the radar reflectivity data the chart uses the log10 value of the probability * severity value seen in slide 15, “Calculating NEXRAD Risk”.
- The chart shows the risk for the selected day (black line) and the previous day (gray line).

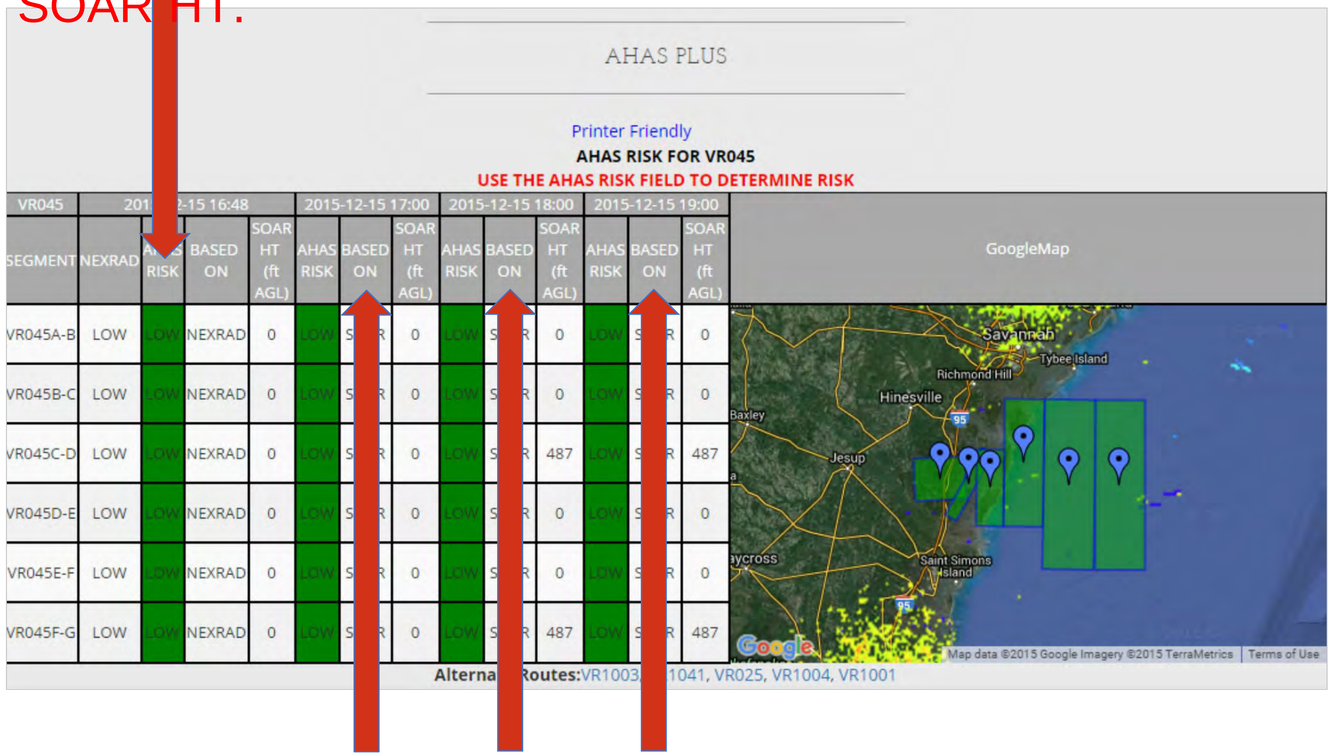
12 HOUR TABLE OUTPUT



- Search Criteria: VR 045 (**1, 2**), hour in Zulu (**3**), output choice, 12HR RISK (**4**)
- AHAS indicates the driving model (**5**) for the overall risk (6), color coded
- NEXRAD risk is only available for the current hour
- 12 hours of risk will be shown starting at the selected hour
- Scroll down for more hours
- No hazards or alternate routes are shown on the 12 hour web page
- Expect longer download times for expanded data

AHAS PLUS

Selected hour information
NEXRAD RISK, AHAS RISK, BASED ON, SOAR HT.



AHAS PLUS

Printer Friendly

AHAS RISK FOR VR045

USE THE AHAS RISK FIELD TO DETERMINE RISK

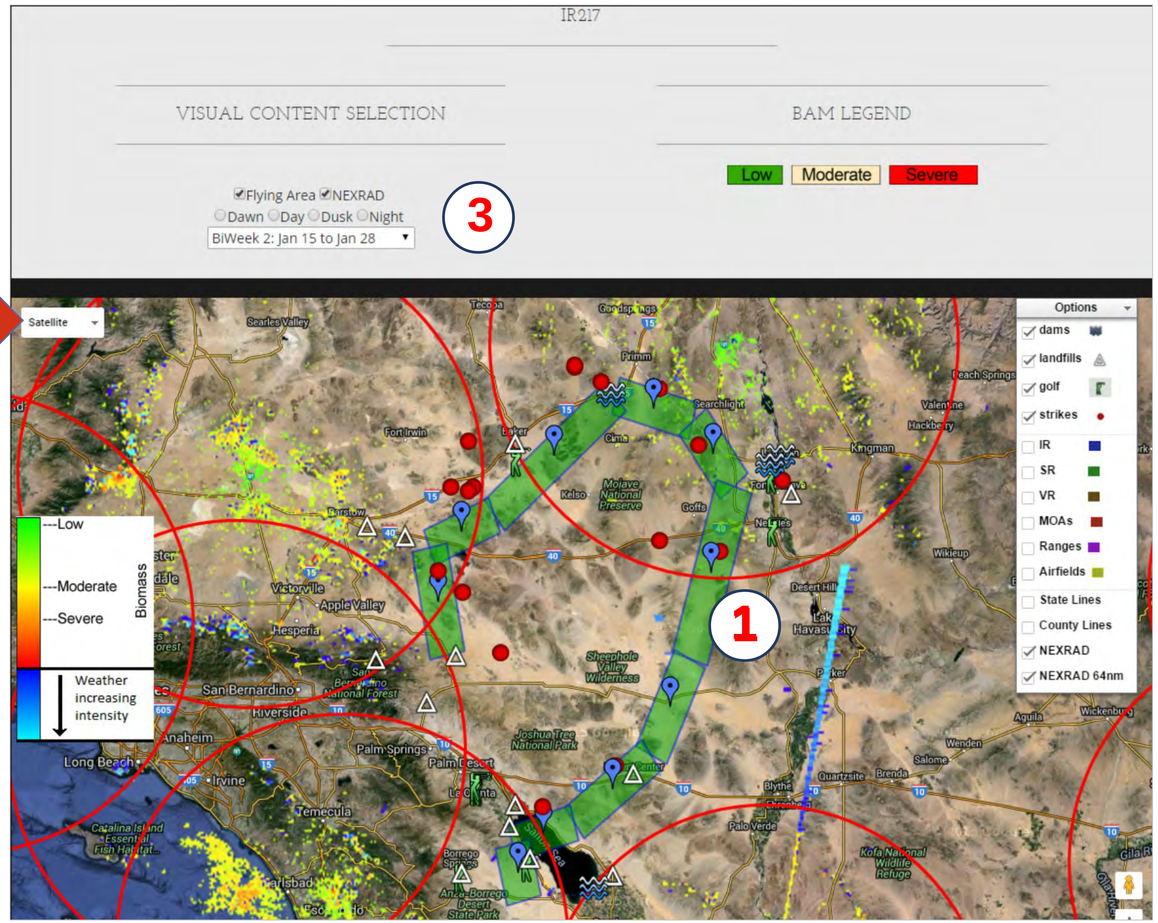
VR045	201 -15 16:48				2015-12-15 17:00			2015-12-15 18:00			2015-12-15 19:00			GoogleMap
SEGMENT	NEXRAD	AHAS RISK	BASED ON	SOAR HT (ft AGL)	AHAS RISK	BASED ON	SOAR HT (ft AGL)	AHAS RISK	BASED ON	SOAR HT (ft AGL)	AHAS RISK	BASED ON	SOAR HT (ft AGL)	
VR045A-B	LOW	LOW	NEXRAD	0	LOW	S R	0	LOW	S R	0	LOW	S R	0	
VR045B-C	LOW	LOW	NEXRAD	0	LOW	S R	0	LOW	S R	0	LOW	S R	0	
VR045C-D	LOW	LOW	NEXRAD	0	LOW	S R	0	LOW	S R	487	LOW	S R	487	
VR045D-E	LOW	LOW	NEXRAD	0	LOW	S R	0	LOW	S R	0	LOW	S R	0	
VR045E-F	LOW	LOW	NEXRAD	0	LOW	S R	0	LOW	S R	0	LOW	S R	0	
VR045F-G	LOW	LOW	NEXRAD	0	LOW	S R	0	LOW	S R	487	LOW	S R	487	

Alterna Routes:VR1003, 1041, VR025, VR1004, VR1001

Next 3 hours

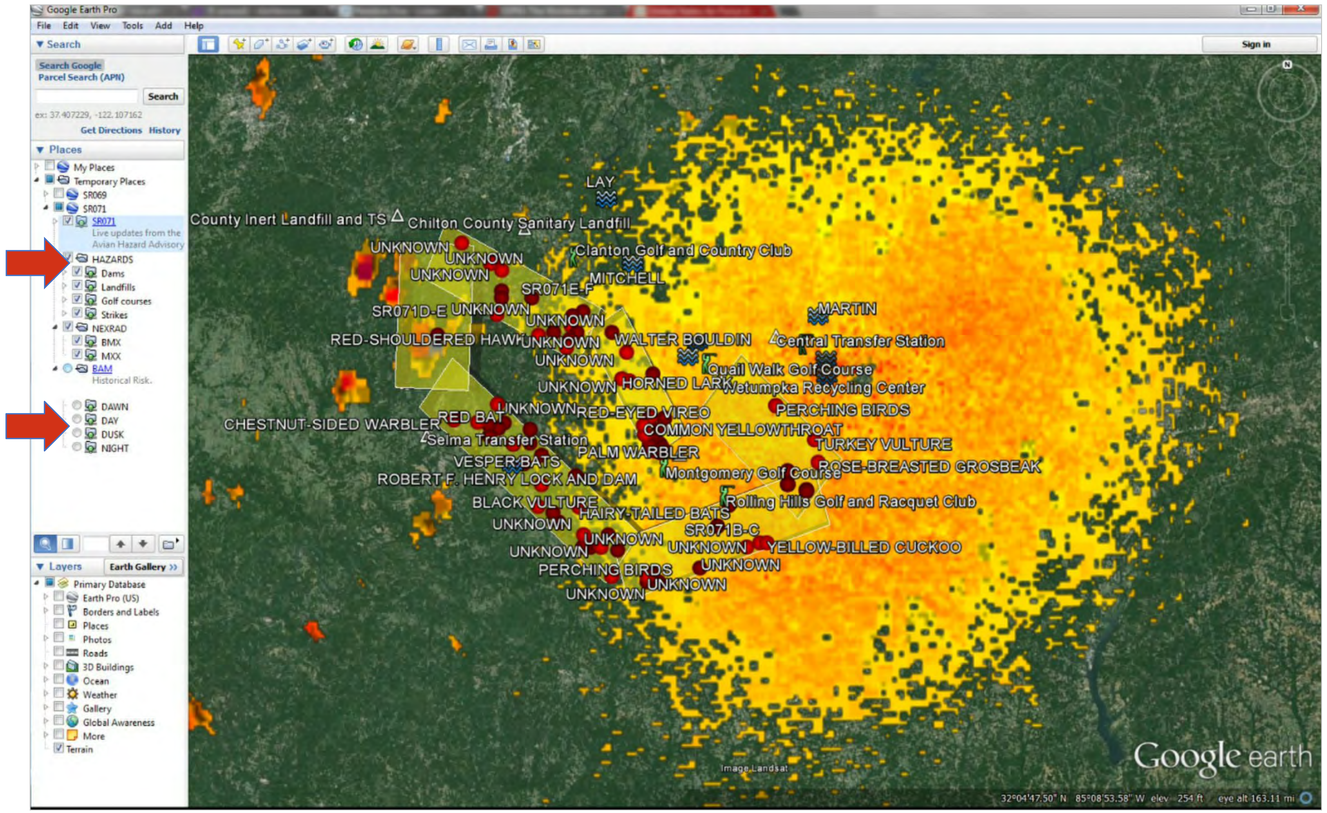
- AHAS plus table opens in a new window
- Hazards and alternate routes will still display (not shown)
- Displays selected hour and the next 3 hours
- NEXRAD risk is only available for the current hour
- Shows driving model and overall risk (color coded) for all 4 hours
- Shows selected area and NEXRAD data in Google Map display

MAP OUTPUT



- Search Criteria: IR217, route color based on current risk. Automatically updates every 6 minutes (**1**).
- Google Map is available for unit-specific pages, but they may be very slow depending on the number of areas.
- Standard Google Map features include pan, zoom and map view or satellite view(**2**).
- Select different BAM bi-weeks and periods (**3**).
- May add different map options (**4**).

GOOGLE EARTH OUTPUT



- Search Criteria: SR 071, current hour
- Risk matches table results and auto updates every 6-10 minutes
- Hazards can be turned on or off, ON in this image (**1**)
- BAM layers can be turned on or off, OFF in this image (**2**)
- Route segment color defines warning level

Green = Low
Yellow = Moderate
Red = Severe

RISK DETERMINATION

- The AHAS risk is determined based on the highest risk between the soaring model and the NEXRAD risk
- If both the NEXRAD risk and the soaring data are not available, the AHAS risk will be based on the BAM
  - If the NEXAD risk is missing the risk will be based on the highest risk between the soaring model and the BAM.
  - If the soaring data is missing and the NEXRAD risk is LOW, the AHAS risk will be based on the BAM
- Missing NEXRAD data will be indicated on the web page as “NO DATA” in the NEXRAD column
- Missing soaring data will be indicated on the web page as “NO DATA” in the Height column

CURRENT HOUR QUERY

Current Condition Query

- Uses NEXRAD weather radar system (updated every 6-10 minutes) to monitor large-scale migratory bird activity in the CONUS and Alaska
- Includes risk from soaring bird activity
- Risk displayed defaults to the most severe prediction model (NEXRAD or Soaring)
  - ➢ Displayed thermal depth height offers maximum altitude and below where conditions are optimal for hazardous soaring birds to be present
  - ➢ May use BAM data if either the NEXRAD or soaring risk is missing
- “Based On” field indicates primary source of risk

CURRENT HOUR - NEXRAD

Operational Risk Management

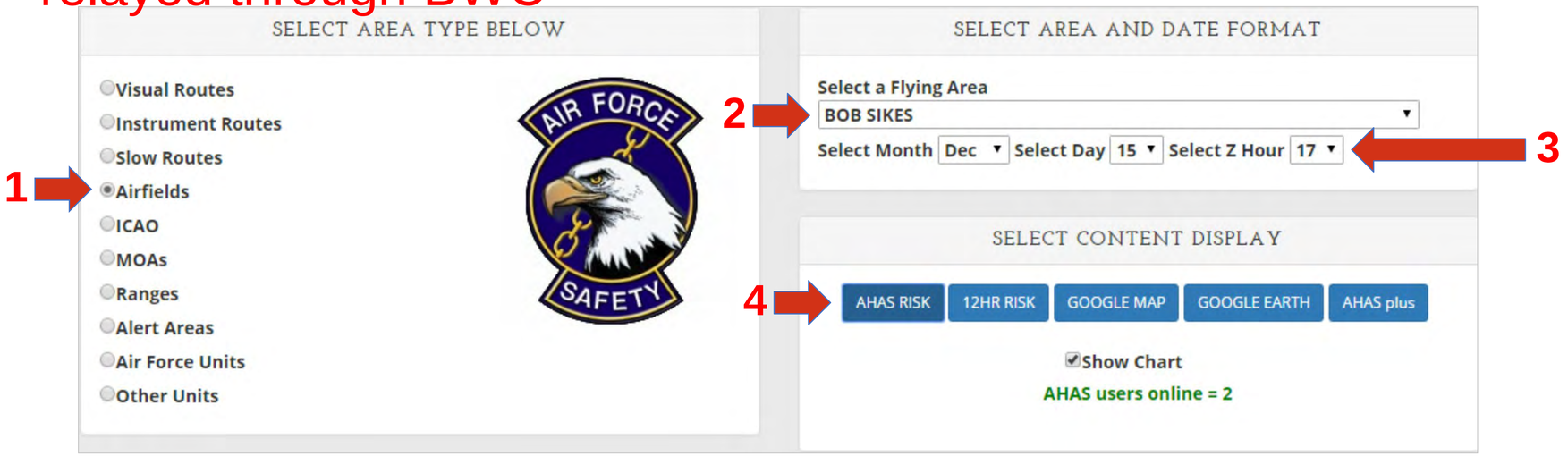
- AHAS uses two factors to calculate NEXRAD risk: “Severity” is based on the dBZ (decibels of Z, where Z represents the energy reflected back to the radar) and “Probability” of a bird strike (percentage of area polygon filled with biological activity)
- AHAS calculates NEXRAD risk by multiplying Severity and Probability to get a value in the below table (**Green** = Low, **Yellow** = Moderate, and **Red** = Severe)
- Any value <= 300 is low risk and > 4000 is severe risk

	Probability				
Severity (z)	20	40	60	80	100
3	60	120	180	240	300
10	200	400	600	800	1000
30	600	1200	1800	2400	3000
100	2000	4000	6000	8000	10000
300	6000	12000	18000	24000	30000

CURRENT HOUR QUERY

Query Example – Bob Sikes

- Go to www.usahas.com
- Click desired area (**1**, Airfields)
- Select Bob Sikes(**2**), current hour in Zulu (**3**), and output format (**4**)
- Note: Airfield Category predicts conditions above and in a 5 nautical mile radius around the airfields and not on the fields themselves
- Actual airfield conditions should be determined by observed conditions and relayed through BWC



CURRENT HOUR QUERY

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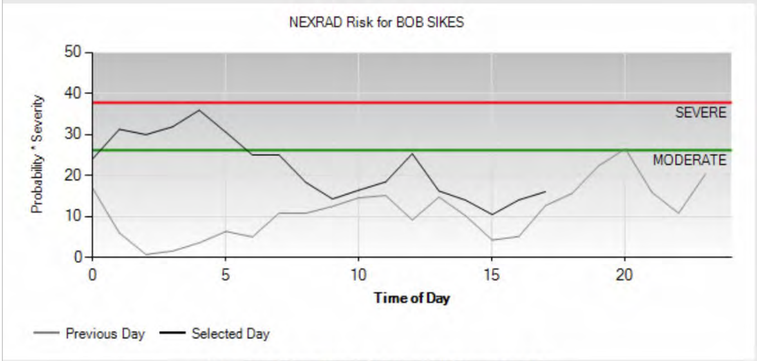
PLEASE WAIT WHILE THE DATA LOADS

BOB SIKES

SEGMENT	DateTime	NEXRAD	BASED ON	HEIGHT (Ft AGL)	AHAS RISK
BOB SIKES	2015/12/15 17:12:0Z	LOW	NEXRAD	NA	LOW



Previous Day= Dec 14, Selected Day= Dec 15

- NEXRAD column shows the current NEXRAD risk. "NO DATA" indicates that the radar is down or the selected hour is not current
- Based On column indicates which model/input is driving the risk reading; in this case, NEXRAD Model
- Overall AHAS risk driven by highest risk model. NEXRAD model overrides any ties. Cell is color coded based on risk
- Height column shows the max altitude (AGL) where soaring birds might be present. In this case, "NA" indicates that the risk is not based on the soaring model. "NO DATA" indicates that the soaring data is missing
- The chart shows the previous days NEXRAD risk compared to today's risk.

FORECAST QUERY

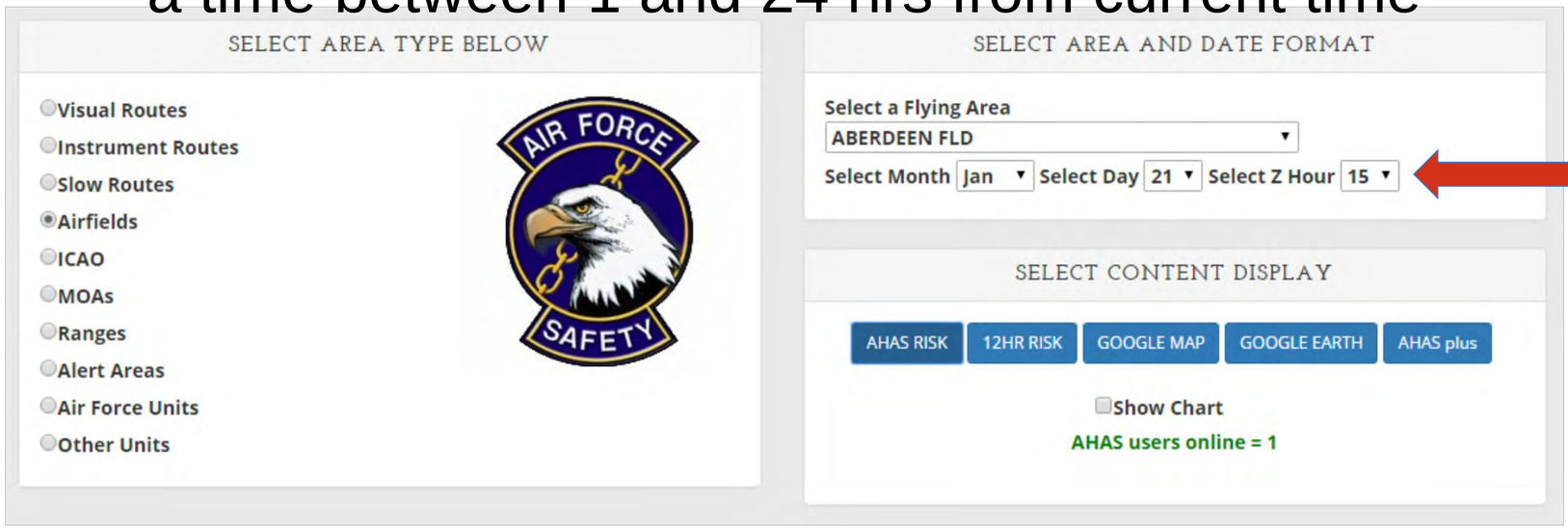
(>1 and up to 24 hours)

- **Forecast Conditions Query**
  - NWS weather observations and forecast model data predict soaring bird activity in the contiguous 48 states and Alaska
  - Soaring models are run twice a day, at 0600 and 1800 to forecast bird strike risk up to 24 hours in advance
  - The Soaring Bird Forecast Model predicts likelihood of soaring birds based on calculating thermal depth and US BAM data
    - ➢ Displayed thermal depth height indicates where conditions are right for soaring birds to be present

FORECAST QUERY

(>1 and up to 24 hours)

- **Query Example – Aberdeen Fld**
  - ➢ Go to www.usahas.com
  - ➢ Click desired area (Airfields)
  - ➢ Select Aberdeen Fld, desired time, and select output format
  - ➢ Everything is the same as a current hour query except you select a time between 1 and 24 hrs from current time



Next hour selected

FORECAST QUERY

(>1 and up to 24 hours)

- Outside of 1 hour NEXRAD data is not available
- Based On column indicates which model/input is driving the risk reading; in this case, SOAR
- Query is from between 1 and 24 hours of the current time
- Height column shows the max altitude (AGL) where soaring birds might be present. In this case, “694” indicates that conditions are right for soaring birds to be present up to 694’ AGL and below

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AHAS RISK FOR ABERDEEN FLD

USE THE AHAS RISK FIELD TO DETERMINE RISK

ABERDEEN FLD

SEGMENT	DateTime	NEXRAD	BASED ON	HEIGHT (Ft AGL)	AHAS RISK
ABERDEEN FLD	2016/01/21 15Z	NO DATA	SOAR	694	MODERATE

HISTORICAL QUERY

(24 hours or past)

- AHAS risk prediction reverts to the BAM if:
  - Query is for a time prior to the current month
  - Query is for time period >24 hrs in advance of the current hour
  - Other data sources are unavailable
- Past data for the current month is now available on the web page
- Past data older than the current month can be requested from the USAF BASH Team

HISTORICAL QUERY

(24 hours or past)

Bird Avoidance Model (BAM) data is based on:

- All bird species present during a particular daily time period, in a particular area, for one of 26 two-week periods in a year
- Geographic information for observations of 60 key BASH species, over a 30-year period
- Several key datasets, including the Audubon Society’s Christmas Bird Count (CBC), the US Biological Survey's Breeding Bird Survey (BBS), bird refuge arrival and departure data for the conterminous US, and data specific to a particular bird species
- Common behavior of species groups modeled for dawn, day, dusk, and night

RISK SUMMARY

- The NEXRAD risk only applies to the current hour. The NEXRAD data shows the bird activity within the last 6 minutes. So that is the most accurate data. There is no way for the NEXRAD data to project what might be happening any time in the future.
- NEXRAD data is designed to remove static targets. That's why it doesn't show mountains and buildings, etc. Soaring birds are static targets when they are riding thermals. The soaring model was added to cover that weakness in the NEXRAD data. So even in the current hour, if the soaring risk is higher than the NEXRAD risk, the soaring risk takes precedence.
- If the current risk for any area is low based on NEXRAD, that also means that the soaring risk is low. The BAM will only be used in the current hour if the NEXRAD data is missing. If the NEXRAD data is missing, AHAS will use the highest risk between the soaring risk and BAM risk. Or if the soaring risk is missing, the NEXRAD is low and the BAM is greater than low.
- For any hour beyond the current hour, the AHAS risk will be based on the highest risk between the soaring model and the BAM.
- You cannot look at hours that have passed, beyond the current month. When you look a time period that has already passed, you are really looking at that time period next year and all you will get is the BAM risk.
- The chart can show the trend of the NEXRAD risk based on the NEXRAD risk from the previous day.

COMMON MISUNDERSTANDINGS

- Misperception: historical data from AHAS contains forecasted or current hour data
  - ➢ It does as long as it is the current month
  - ➢ Requested historical data prior to the current month is from the US BAM only
- Using AHAS to determine Bird Watch Condition code
  - ➢ NEXRAD cannot see the lowest airspace\surfaces of the airfield so cannot substitute for on airfield observations of Bird Watch Conditions, it can see the higher altitude movements that are missed at the surface and can add to the bird watch condition, but it cannot evaluate the unseen conditions at the surface
- Expecting NEXRAD data for forecasted and historical queries
  - ➢ NEXRAD is updated every 6-10 minutes for current hour queries only and can not be forecasted or give historical data at this time

BEST PRACTICE

- Use BAM data when acquiring route times
  - ➢ Adjust/modify routes based on AHAS forecasts
- Use BAM in conjunction with AHAS during planning
  - ➢ Pinpoint wildlife attractants along route of flight
  - ➢ Identify NEXRAD coverage areas or nearest radar to route
- Access AHAS just prior to step time
- Incorporate ops procedures in local BASH plan
  - ➢ Call SOF/Sqdn Ops to get current AHAS reading prior to base departure, low-level segments, or when approaching airfield/training area
- Utilize Unit Specific AHAS Web Pages

BEST PRACTICE

(Unit web pages)

- Unit Web Pages can include:
  - Transition bases
  - Flight routes
  - Ops and Range Areas
  - Specific data impacting mission
- Unit Web Pages are ideal for:
  - Operations Supervisors
  - SOFs
  - Crews stepping to fly
- Unit Web Pages can be tailored to suit user's needs
- Hazards do not display on unit web pages

USAF BASH Team

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