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Understanding Bird Strike Risk from Analysis of Avian Radar Generated Events

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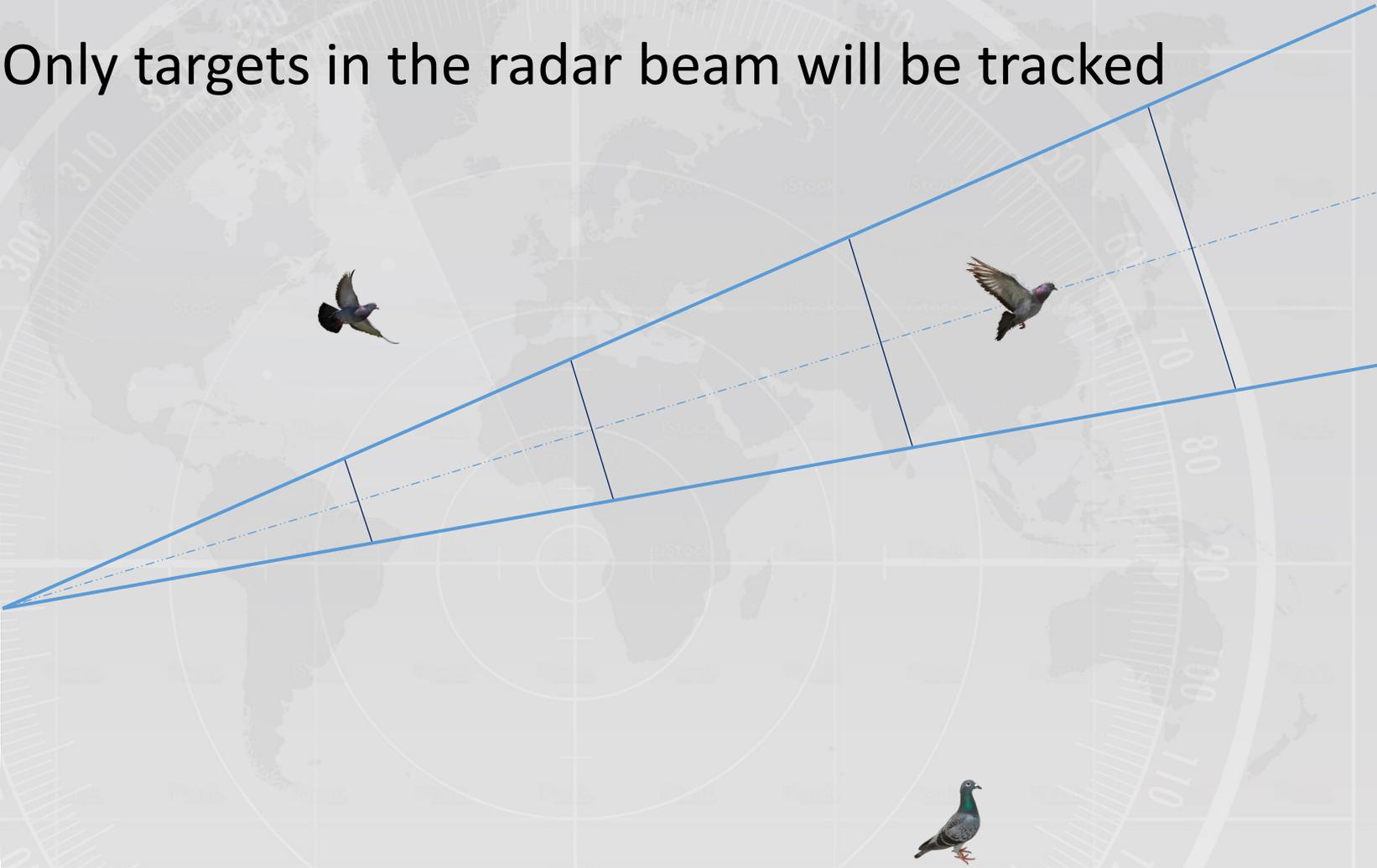
How does avian radar see birds?



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Only targets in the radar beam will be tracked



How does avian radar see birds?



Line of sight is required to track a target

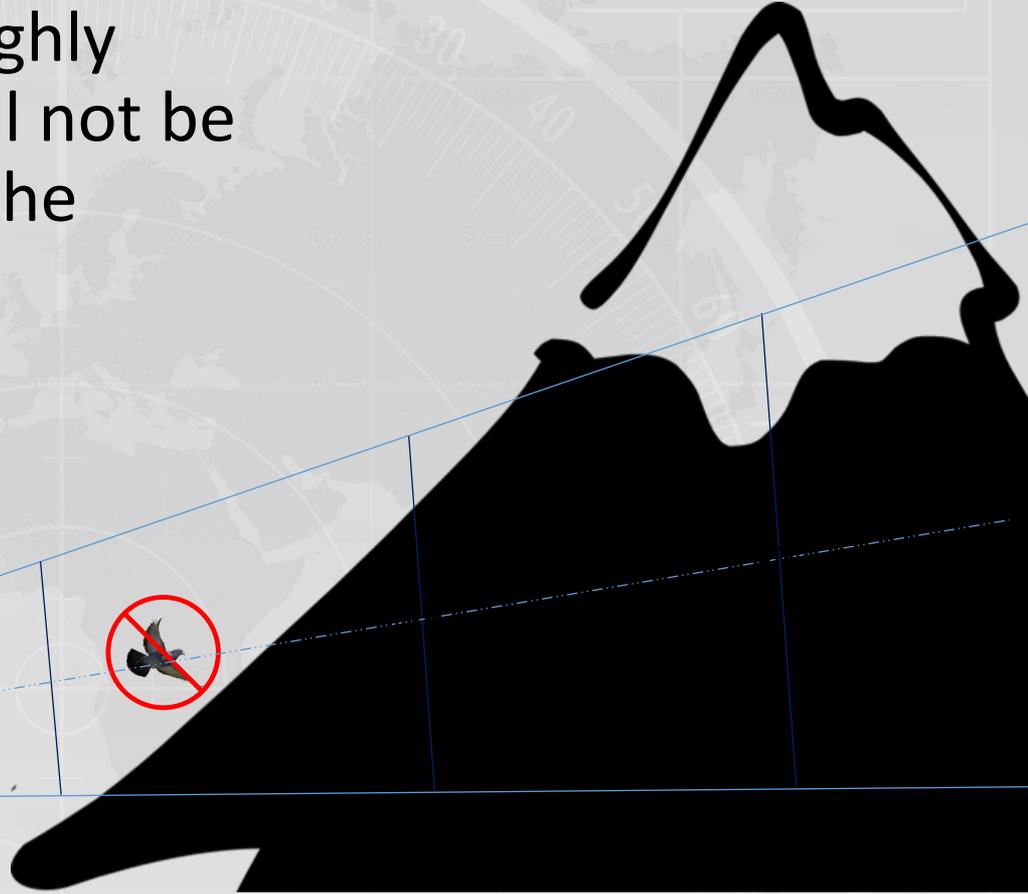


Understanding Avian Radar Events

How does avian radar see birds?



Targets in front of highly reflective objects will not be differentiated from the background



Radar Equipment



Olympic



Cascade



Agile



Defining Event Logic: Examples of Event Criteria



Track Characteristics

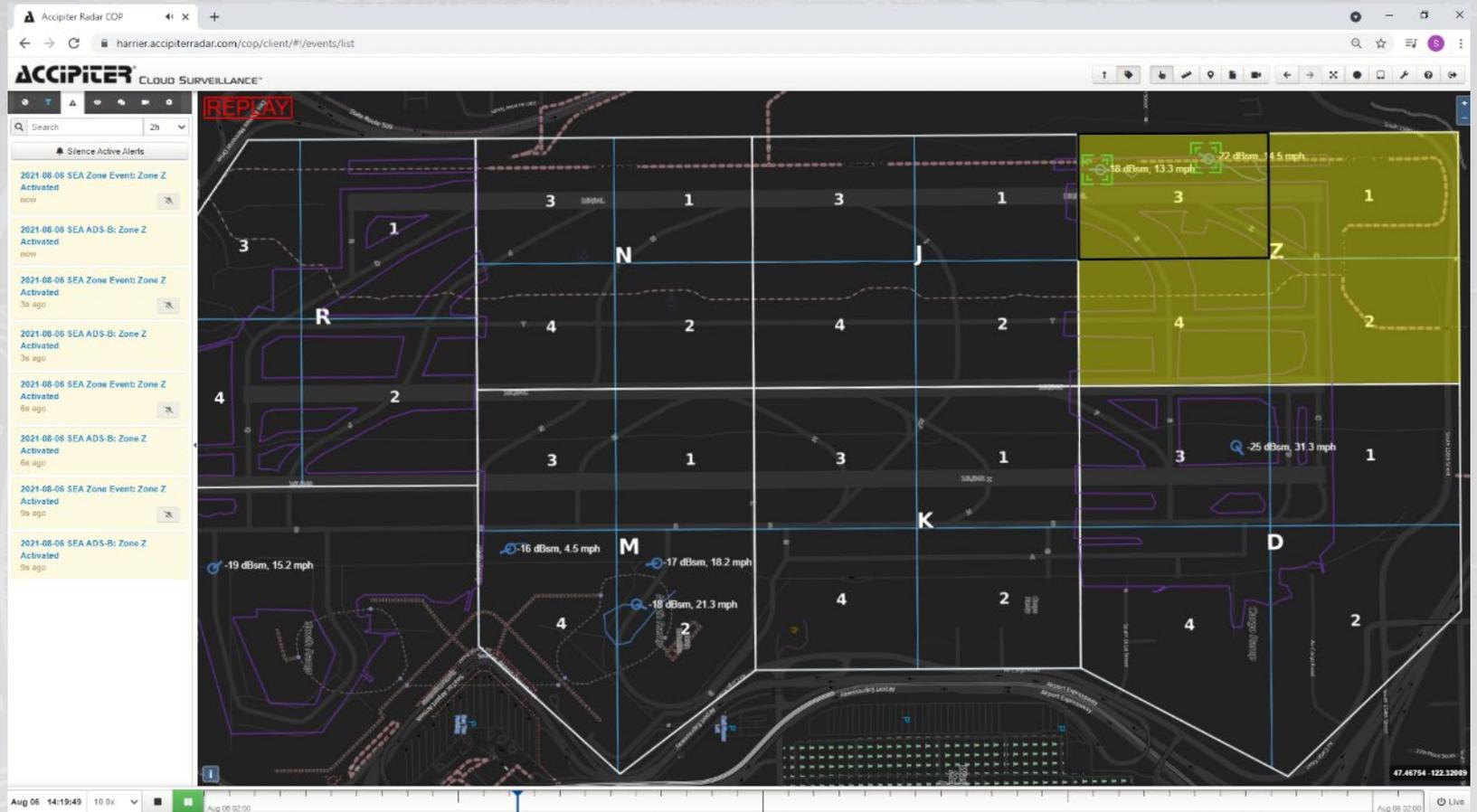
- Size
- Speed
- Altitude
- Number of track updates
- Track duration
- Sinuosity
- Heading
- Radar



Other Attributes

- Number of tracks
- Persistence
- Geographic location*
- Other

How are events generated?



Standard Operating Procedures (SOPs) for Avian Radar at SEA



Event Design - Logic



Track Characteristics

- Size (**-25 to -7 dBsm**)
- Number of track updates (**minimum of 2**)
- Track duration (**7s – 5min**)

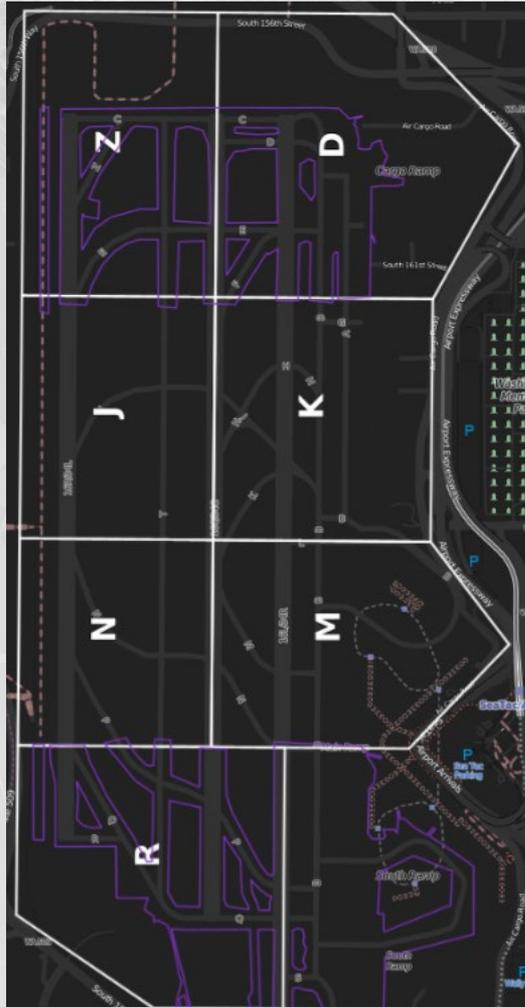


Other Attributes

- Number of tracks (**1 – 12**)
- Persistence (**bird activity present for 25% of the past 15 minutes**)
- Geographic location* (**within zone, outside of masked regions**)
- Radar (**Cascade and Olympic only**)

Event Design

Cascade Masks



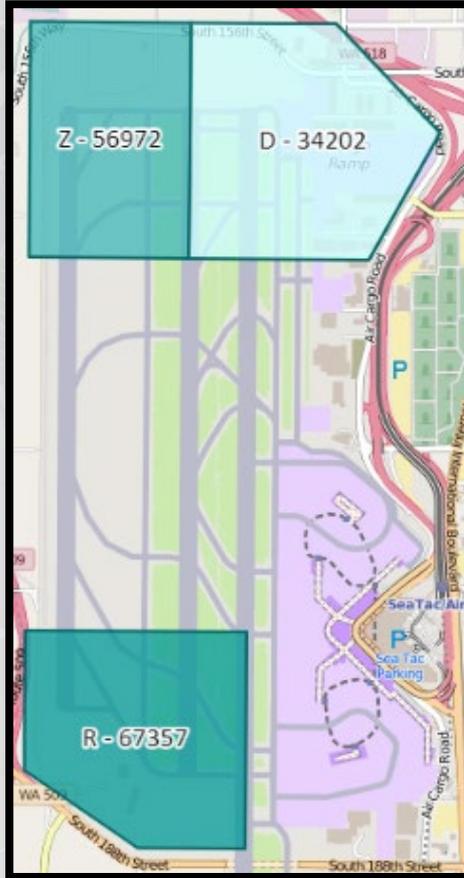
Olympic Masks



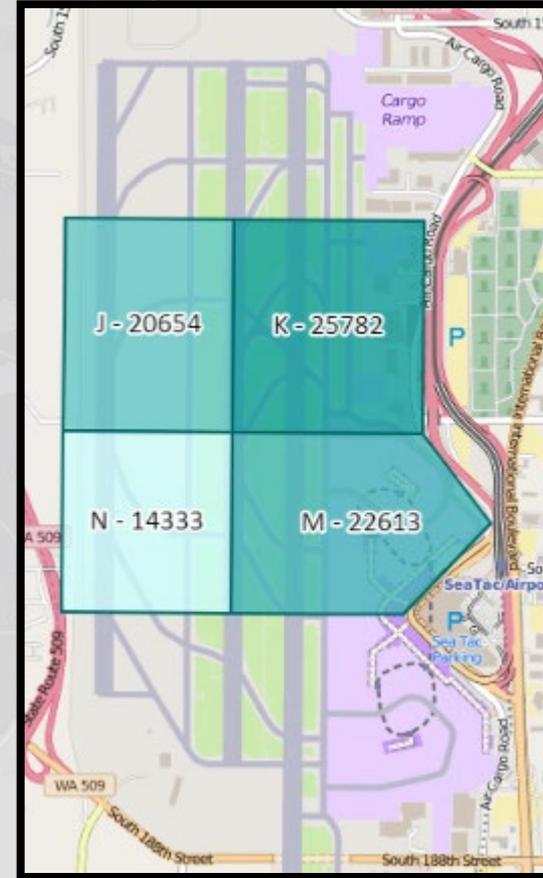
Event Analysis January 01, 2021 – August 01, 2021



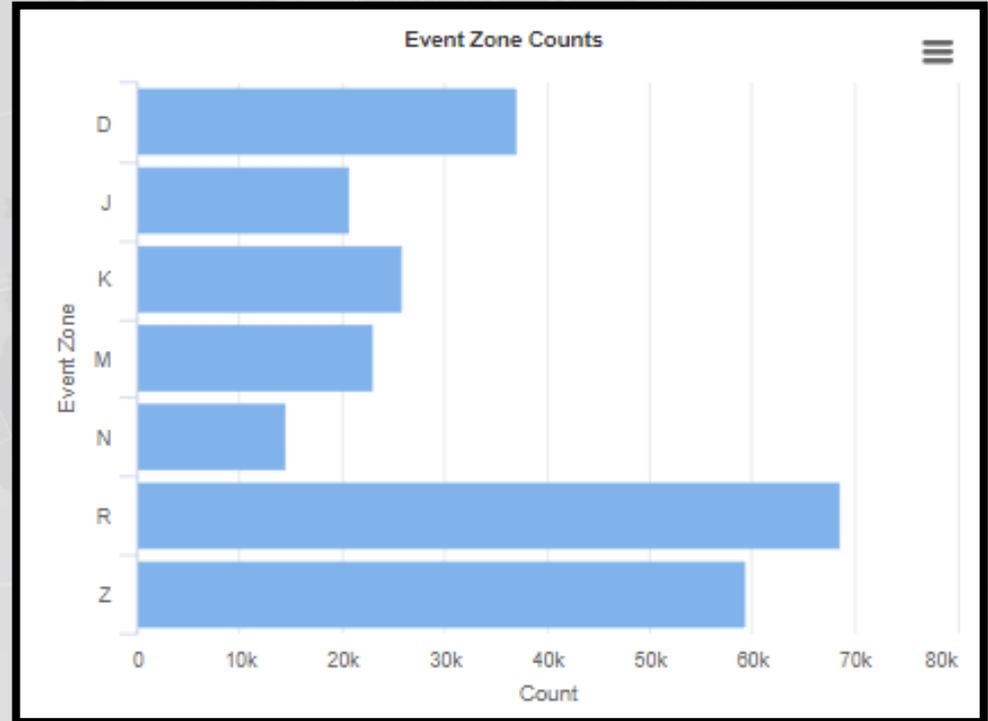
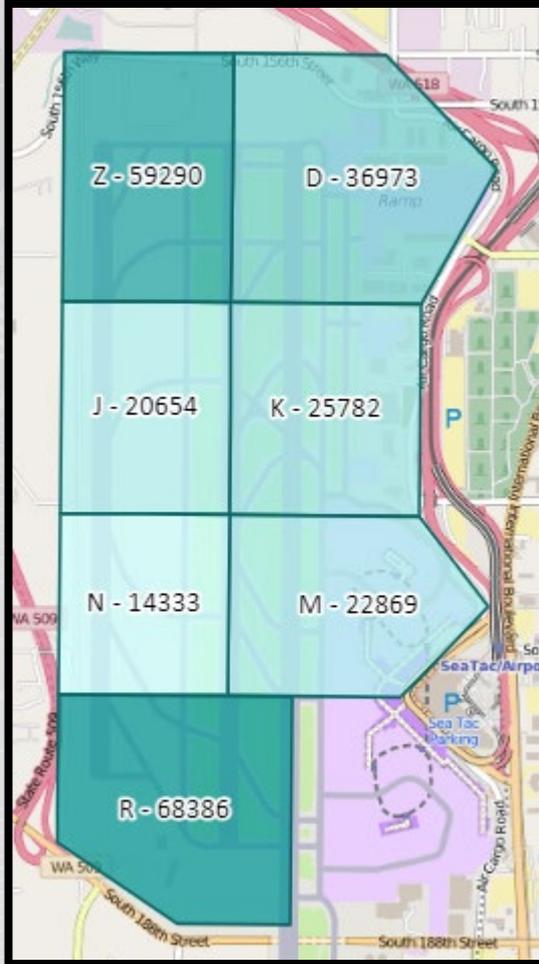
Cascade Events



Olympic Events



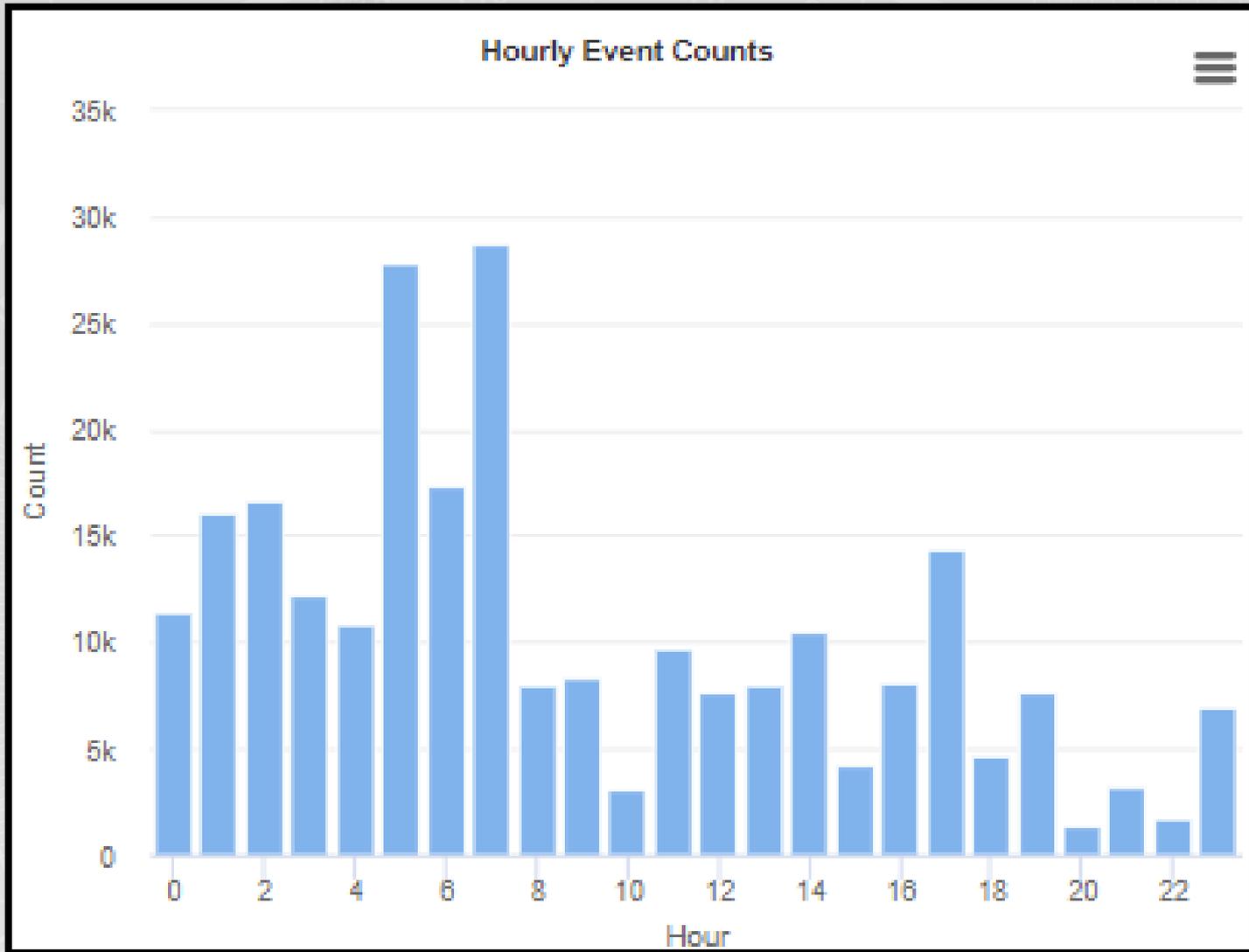
Event Analysis January 01, 2021 – August 01, 2021



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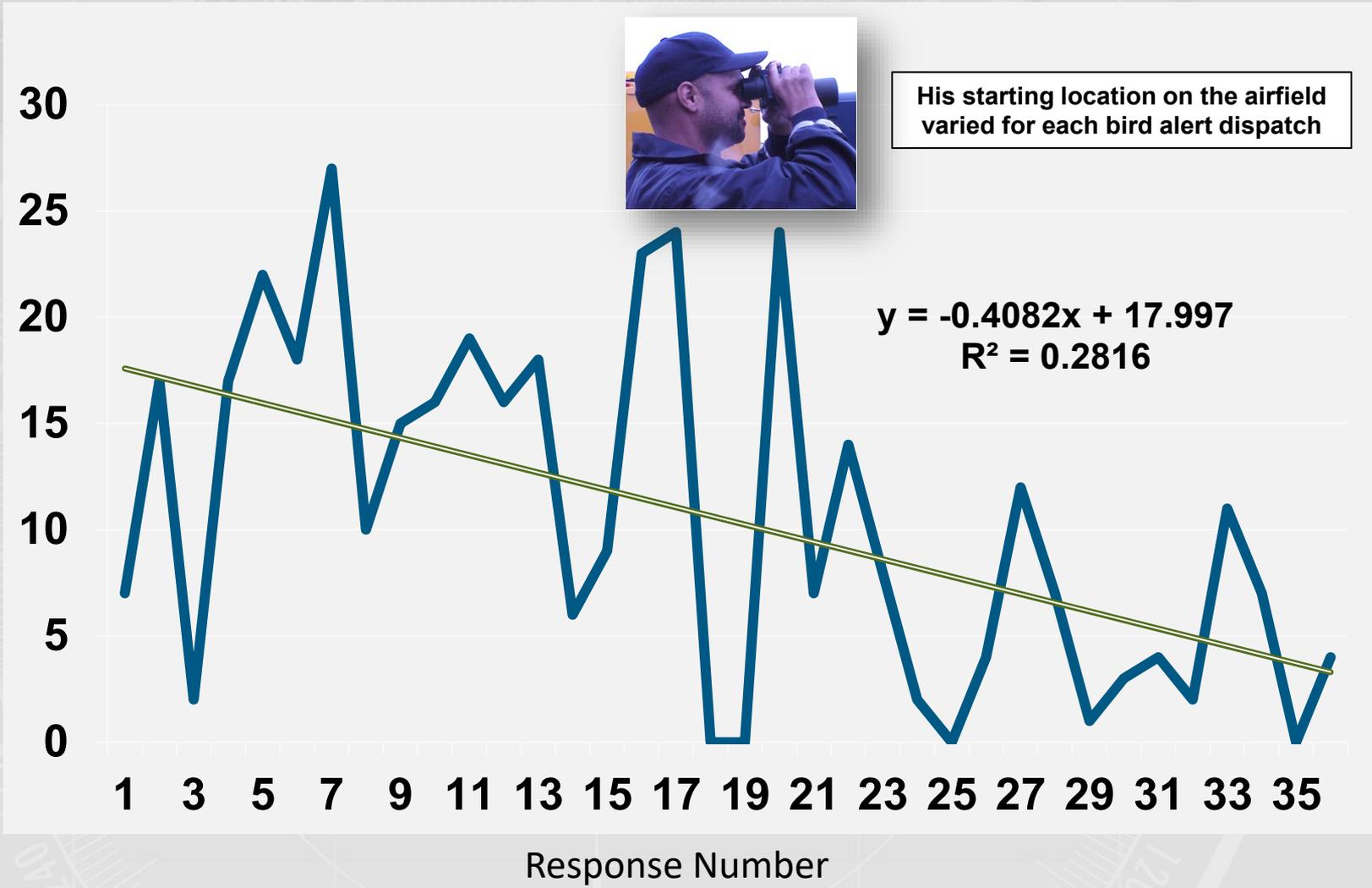
Event Analysis January 01, 2021 – August 01, 2021



Event Response Times



Minutes



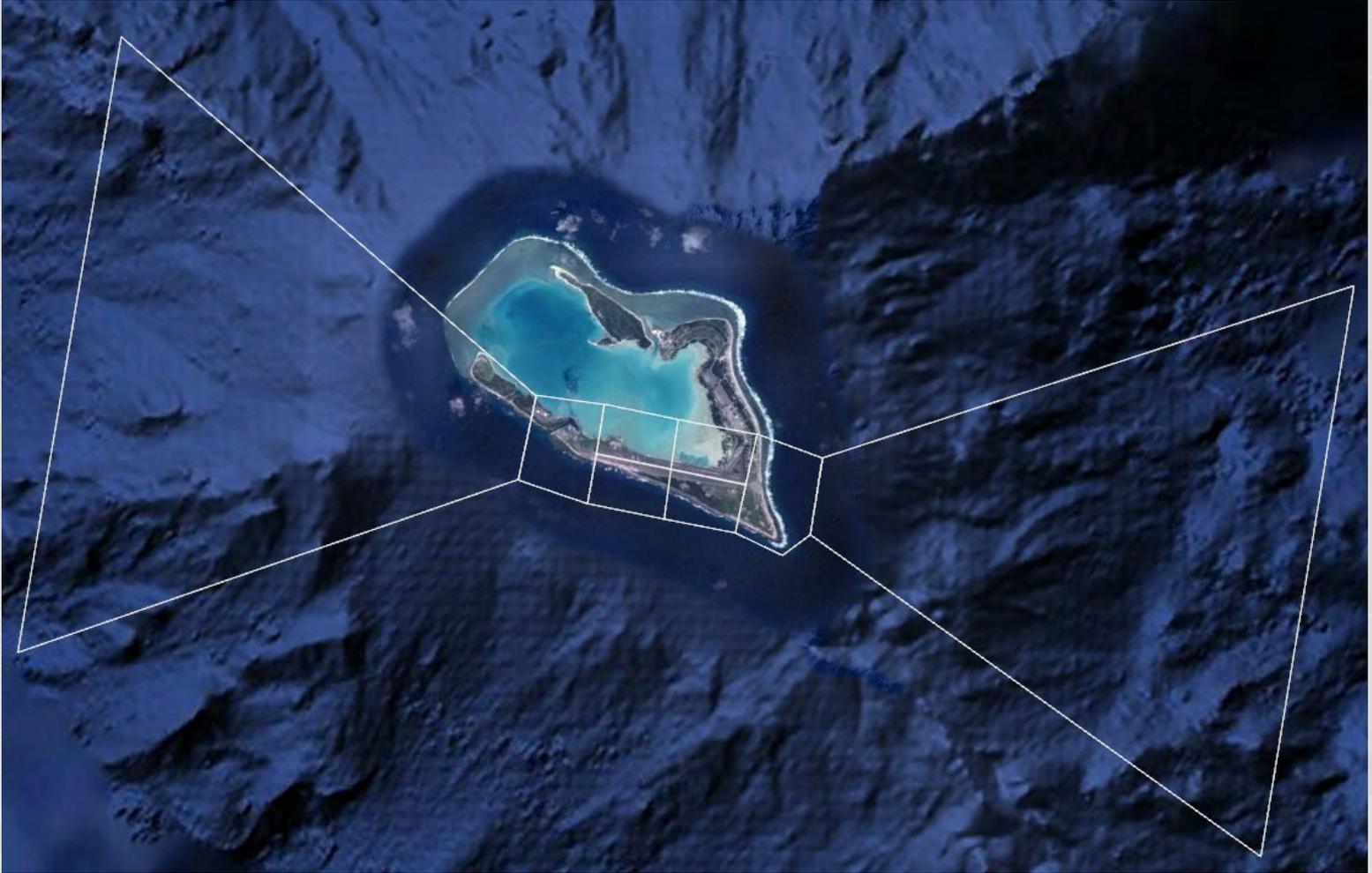
His starting location on the airfield varied for each bird alert dispatch

$$y = -0.4082x + 17.997$$
$$R^2 = 0.2816$$

Events related to strikes (2020-10 white-fronted goose strike)



Monitoring arrival and departure corridors - USAF



Monitoring arrival and departure corridors and migration corridors - INA



Monitoring specific species returning or departing from a roost site - MCAS



Next Steps For Avian Radar Events

Thank You



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