Weather Mapping for General Aviation Pilots

General Aviation Pilots

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General Aviation Community

Many airports to fly to:

- **+10,000 small** towered, non-towered, uncontrolled, and private airports

Thousands of amateur pilots:

- **+161,000** private pilots
- **+222,000** student pilots

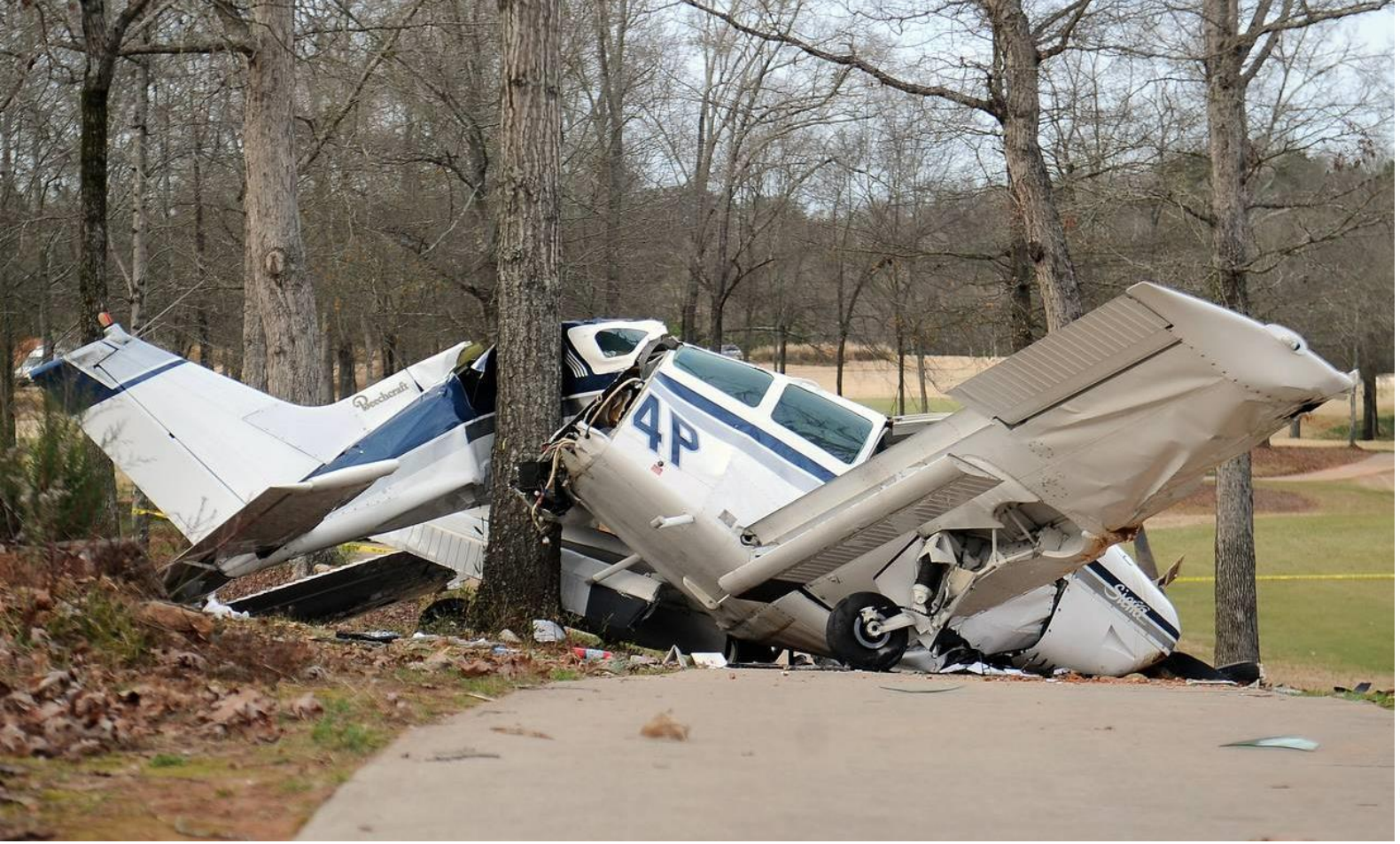
Contributing Risk Factors for Aviation

Safety:

- **Safety Disparity:**
  - Commercial aviation: highly safe
  - General Aviation (GA): higher accident rate
- **Factors Contributing to GA Risks:**
  - Aging Planes
  - Critical decision making from PIC
  - Potential proficiency challenges
- **Accident Causes:**
  - Pilot Errors
  - Weather Challenges

Weather

- **Weather-Related Risks:**
  - Spatial Disorientation: Clouds lead to loss of control (<3 mins)
  - Lack of Visibility: Main cause for CFIT accidents
  - Ice Deposition: Dramatically degrades lift, leading to stalls
- **FAA Emphasis on Weather Avoidance:**
  - Prioritizes weather avoidance in pilot training
  - Challenges in accessing and analyzing relevant weather information



FLIGHT SAFETY FOUNDATION

Industry Updates The Foundation

"Some weather-related accidents are founded on the pilot's lack of knowledge of weather theory and/or weather services," AOPA says. "Some happen because the pilot failed to obtain a good weather briefing, or to heed the warning signs they discovered in a weather briefing."

By far, the most dangerous conditions occur when a flight being conducted under visual flight rules continues into IMC. As noted in the 26th Joseph T. Nall Report, published by AOPA, "Almost 70 percent of all accidents in IMC were fatal, compared to 17 percent of those in visual meteorological conditions (VMC) during daylight hours and 26 percent of those in VMC at night".[2]

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Risk Factors Associated with Weather-Related General Aviation Accidents

- **Three injured in GA plane crash near Gainesville, Florida** [3]: The pilot and two passengers of a Cessna 182 Skylane suffered minor injuries when the plane crashed on a golf course on January 25, 2019. The pilot reported encountering severe turbulence and a loss of control due to a thunderstorm.
- **Two killed in GA plane crash near Grand Canyon, Arizona** [4]: The pilot and passenger of a Van's RV-7 experimental aircraft died when the plane crashed in a remote area on October 6, 2019. The plane was flying in low visibility and

“It’s better to be on the ground wishing you were in the air than in the air wishing you were on the ground.”

So…

We developed a pilot’s best friend!

Real Time Planning Map

Airport Information:

Position, elevation, and runway directions.

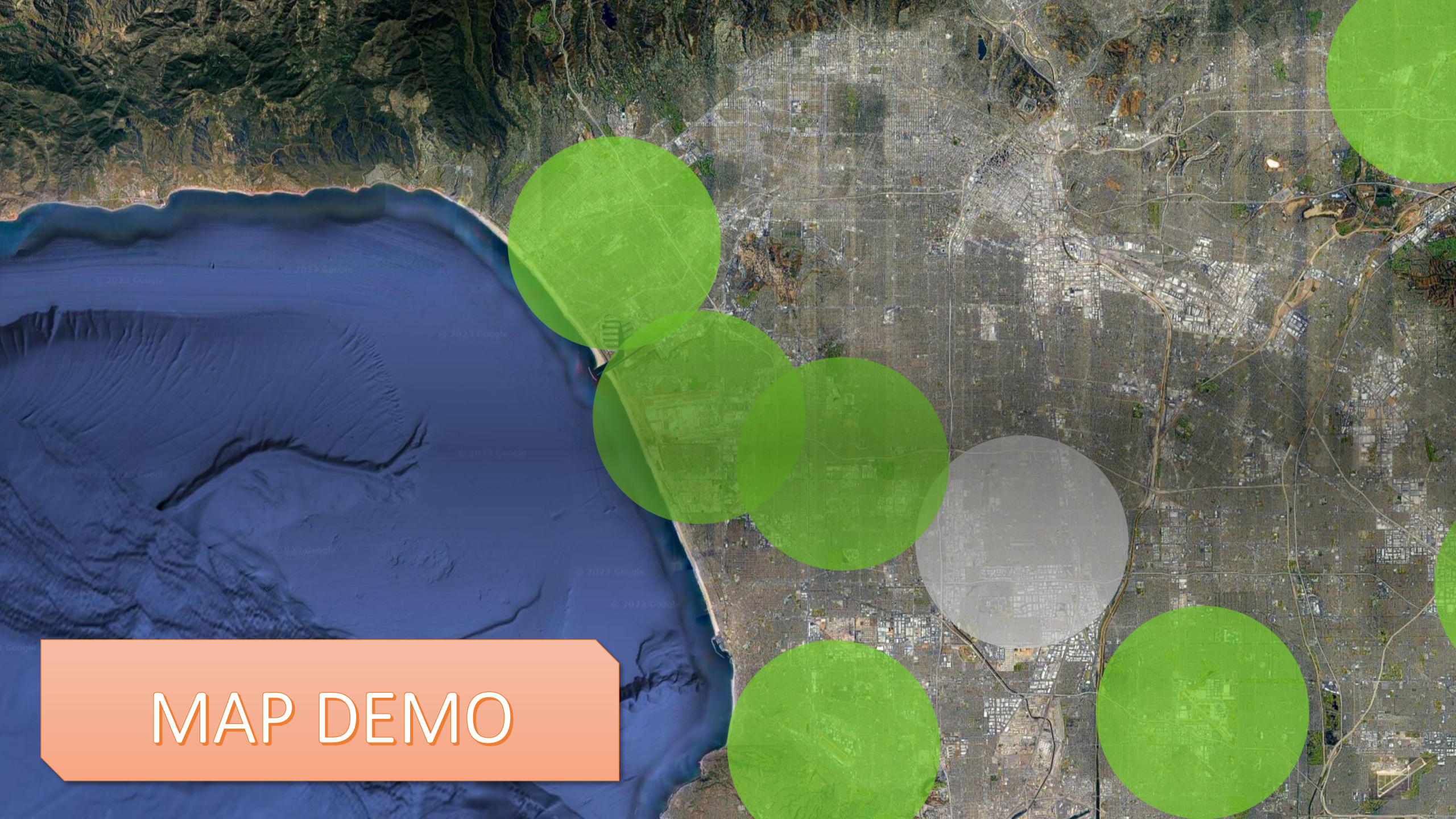
Satellite view of airports and their surroundings.

Weather Information:

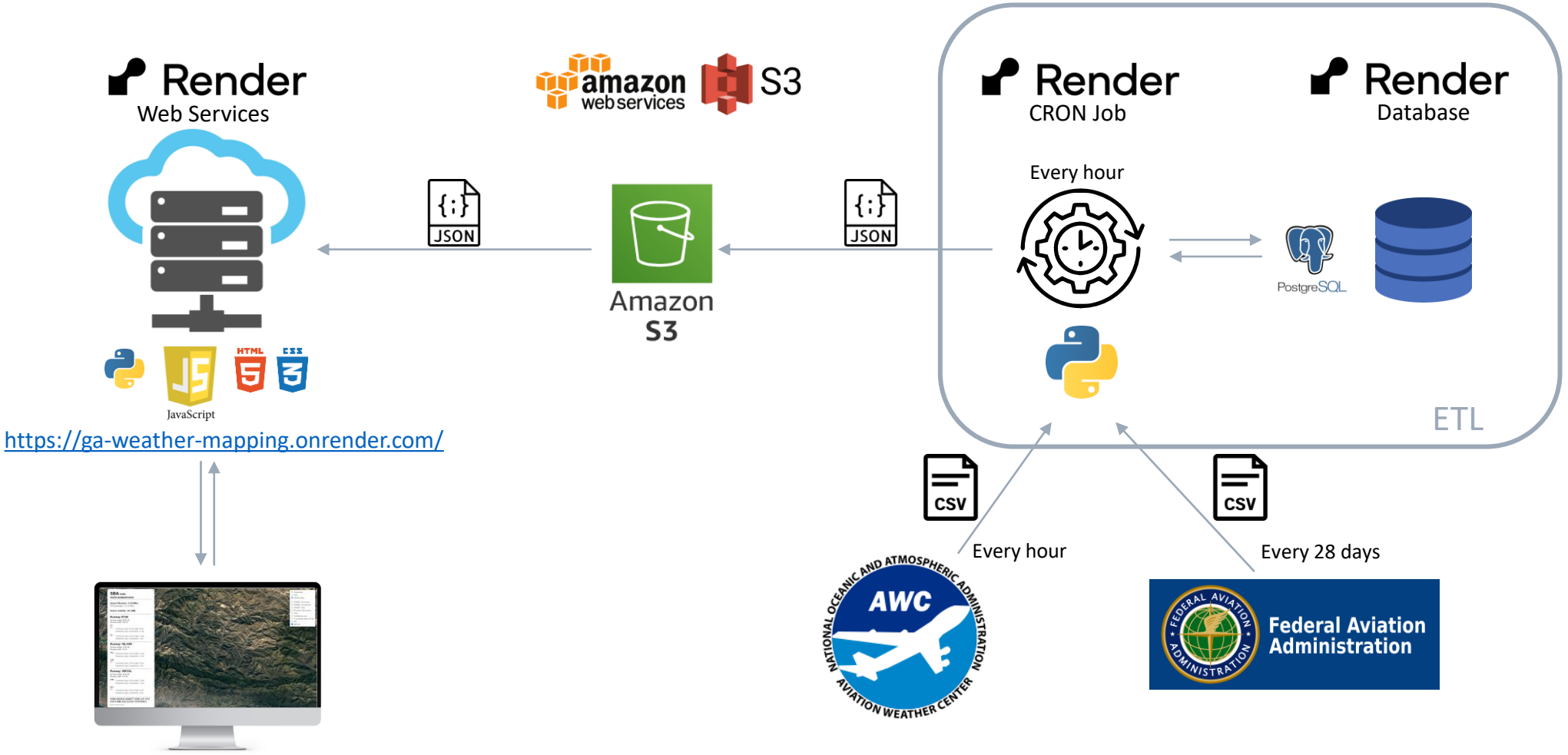
Real-time updates on wind, visibility, flight categories, ceiling, and atmospheric pressure.

Areas of Concern:

Display of critical areas, including mountain obscurations, turbulence, and icing.


MAP DEMO

Data Flow Chart



Conclusion

- **Problem:**
  - Too many accidents could have been avoided with good weather briefings and better pre-flight preparation
  - Existing sources of information for the weather can be overwhelming for inexperienced pilots
  - Mistakes can be critical and fatal in some instances
- **Solution:**
  - Pilots in command need to independently be aware of weather conditions before making decisions pre-takeoff
  - One stop application providing relevant weather information for go/no-go decisions
- **Impact:**
  - We have contributed to equipping pilots with a real-time planning application, better suiting occasional pilots with a user-friendly mode of use focusing on the current critical conditions