Feedback to AEDT2b from a ATM researcher viewpoint

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Outlines

- Team and research overview
- Use case
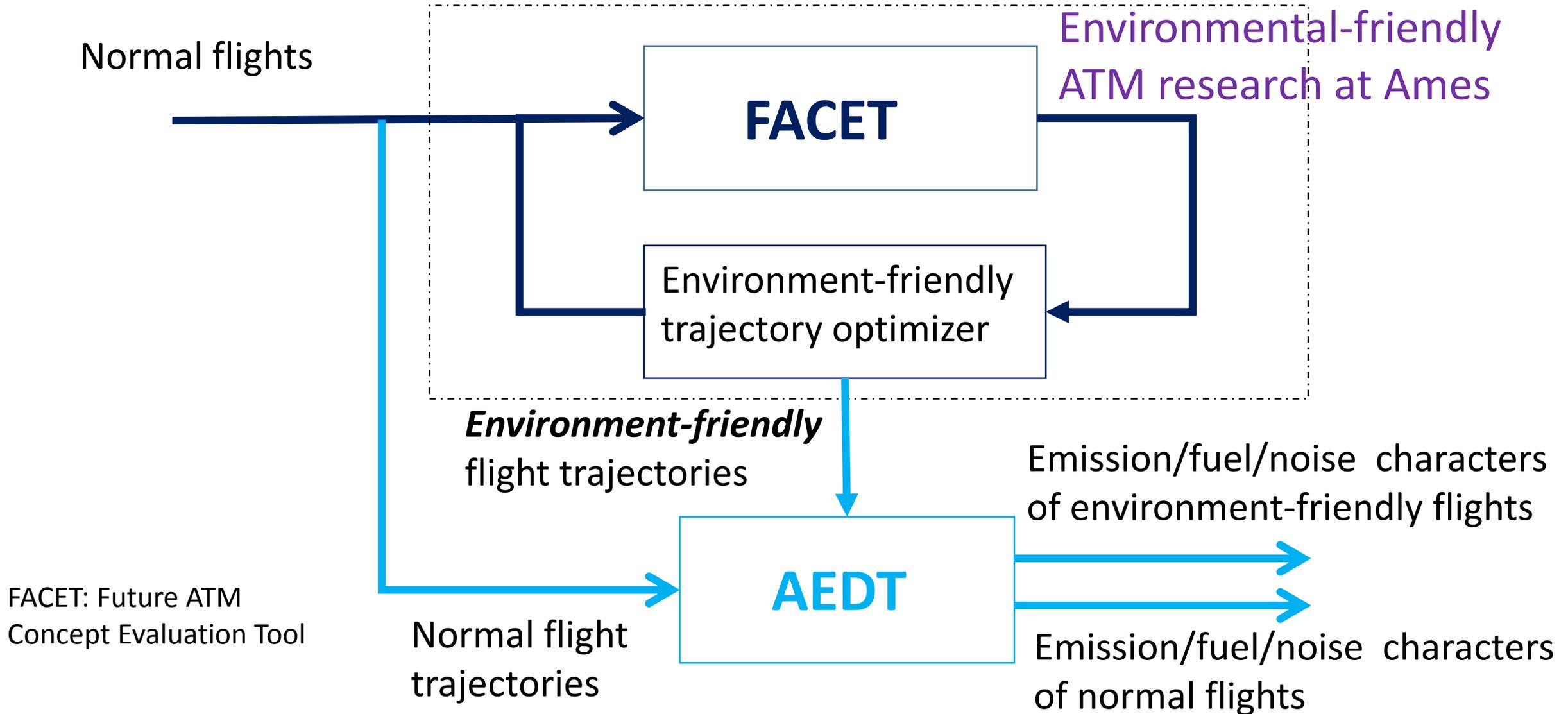- Design and assessment strategy

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Our ATM Environmental Research Team

- Dr. Banavar Sridhar, Senior Scientist
- Dr. Jinhua Li, Research engineer
- Dr. Hok K. Ng, Research scientist

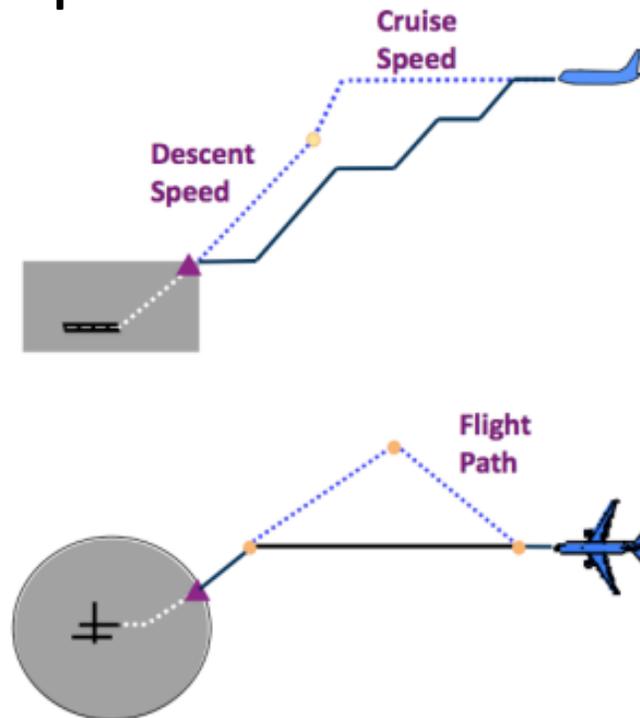# Design and Assessment Software Platform

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Use Case #1: Efficient Arrival

- Use AEDT2b to evaluate environment benefits/costs of efficient arrival compared with traditional arrival


Ref: R. Coppenbarger, et. al. "The efficient descent advisor: technology validation and transition", 2012
K. Elmer, "Operational implementation of tailed arrivals at SFO and expected environment benefits", 2008

Create the study

1. Pick a sample flight track of DAL1456 (KJFK..KSFO, 737300)
2. Convert the track into a ASIF file with normal & efficient descent profiles
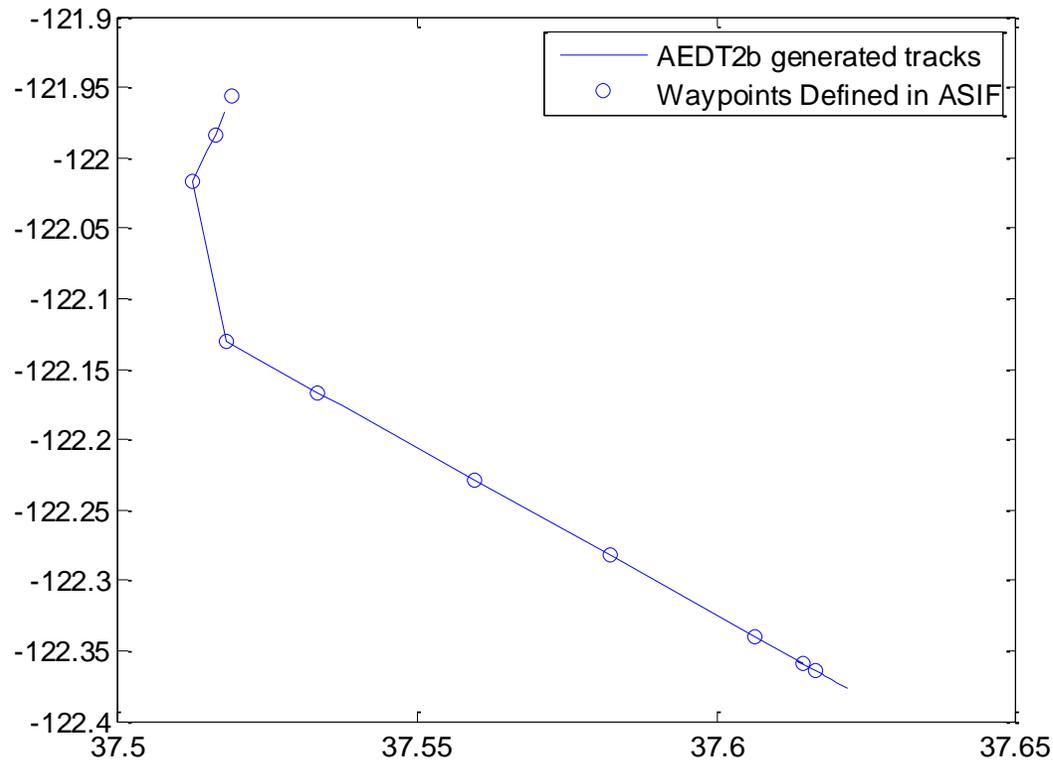3. Open a study with ASIF file and run the study

Normal and Efficient Descent profiles from AEDT2b
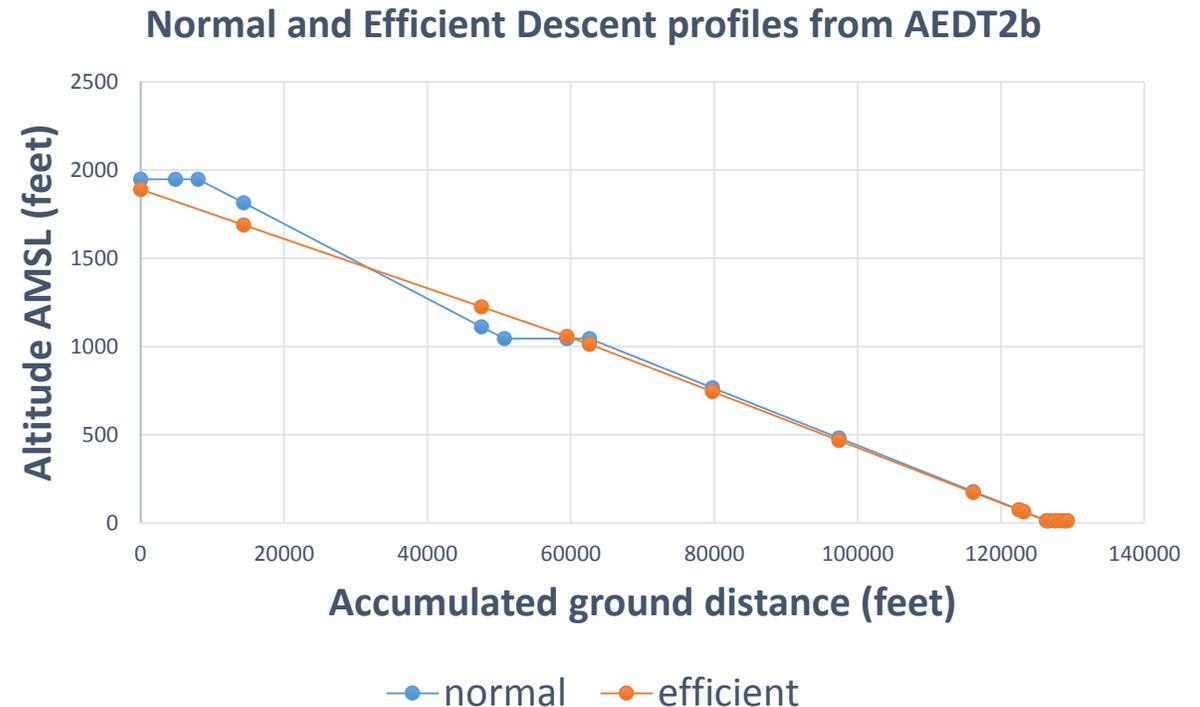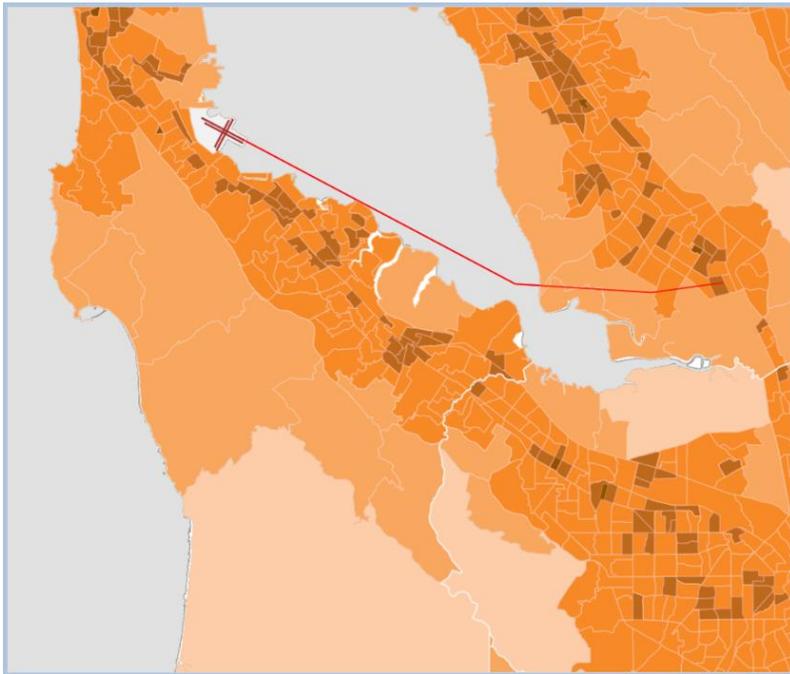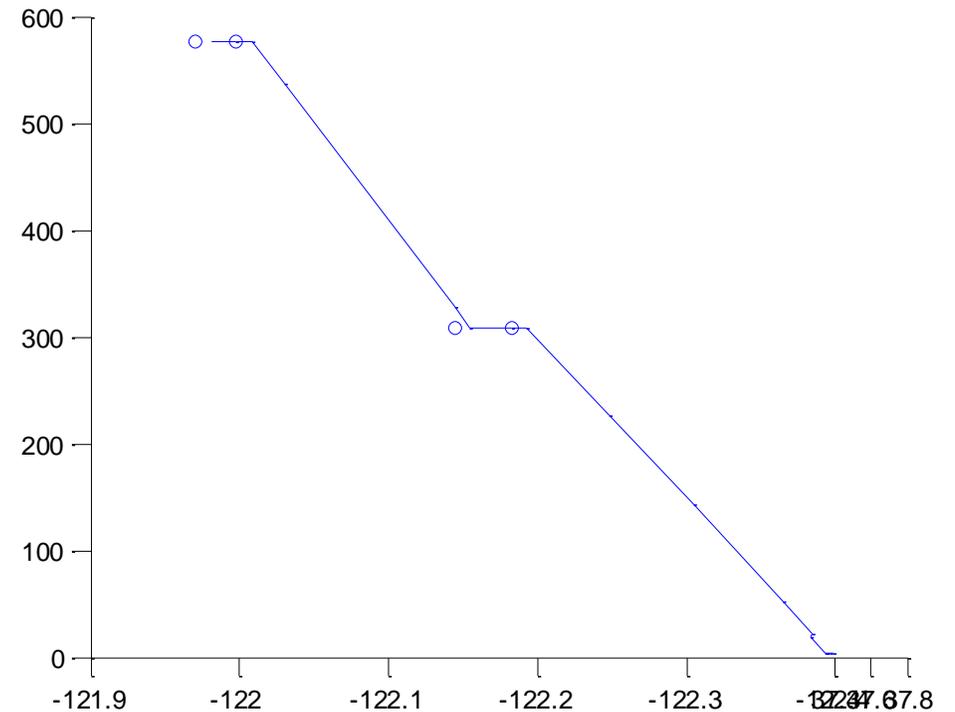
Results Analysis: Trajectory

- Q1: How accurate does AEDT2b match with pre-defined 3-D waypoints?
Pretty good!

Horizontal profile

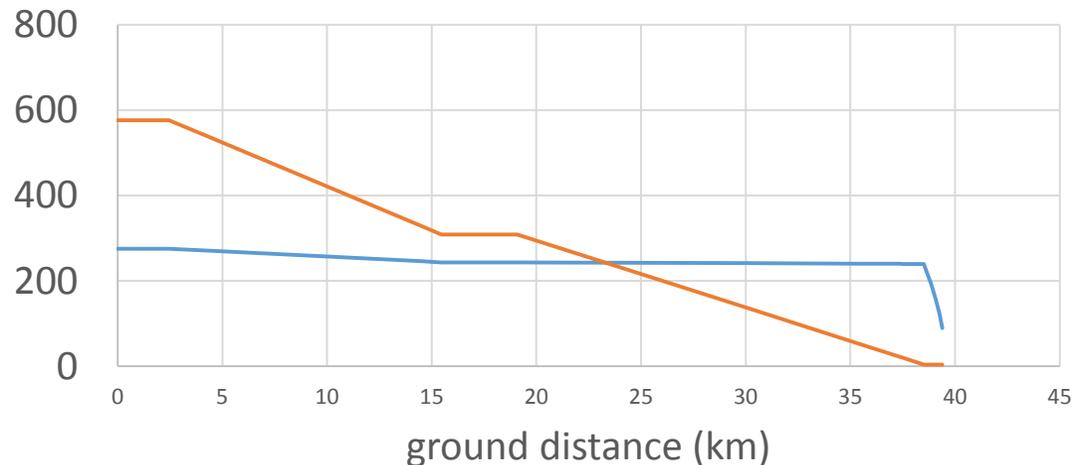Vertical profile

Results Analysis: Fuel

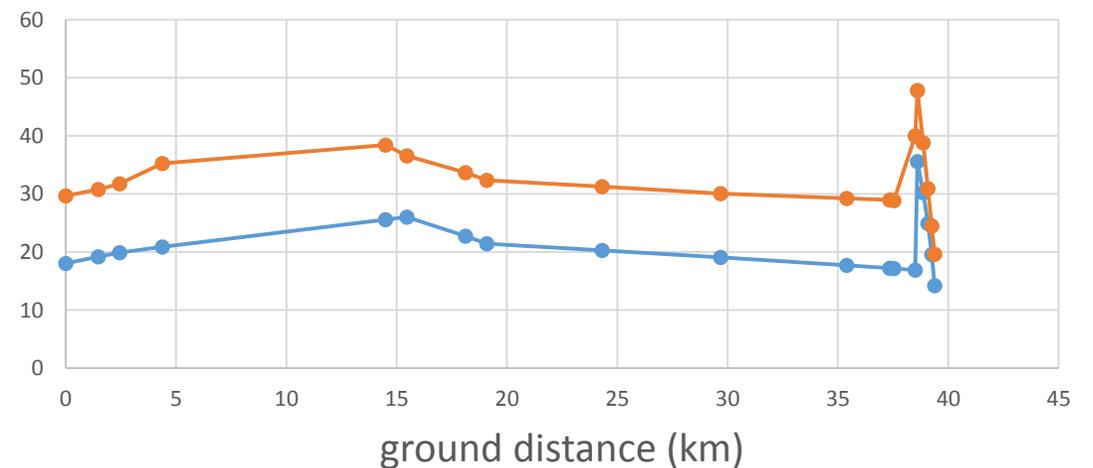|	Fuel (kg)	Flight distance (km)	Flight time (minutes)
normal descent	**378.6**	39.5	9
efficient descent	**370.5**	39.5	9

ED saved 8Kg Fuel

Results Analysis: Aircraft Performance Report

- Detailed flight performance report segment by segment.
- Export the data into Excel for further analysis conveniently.
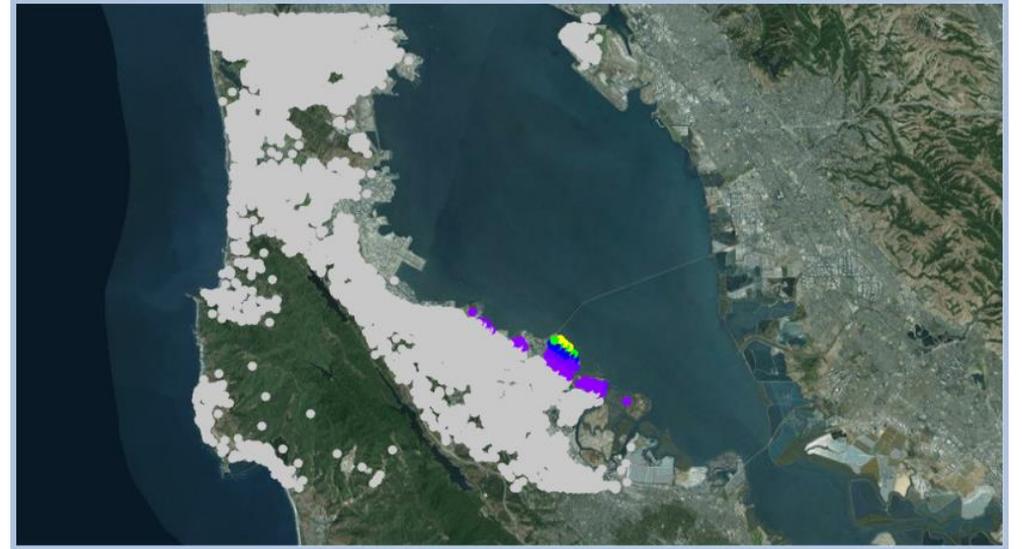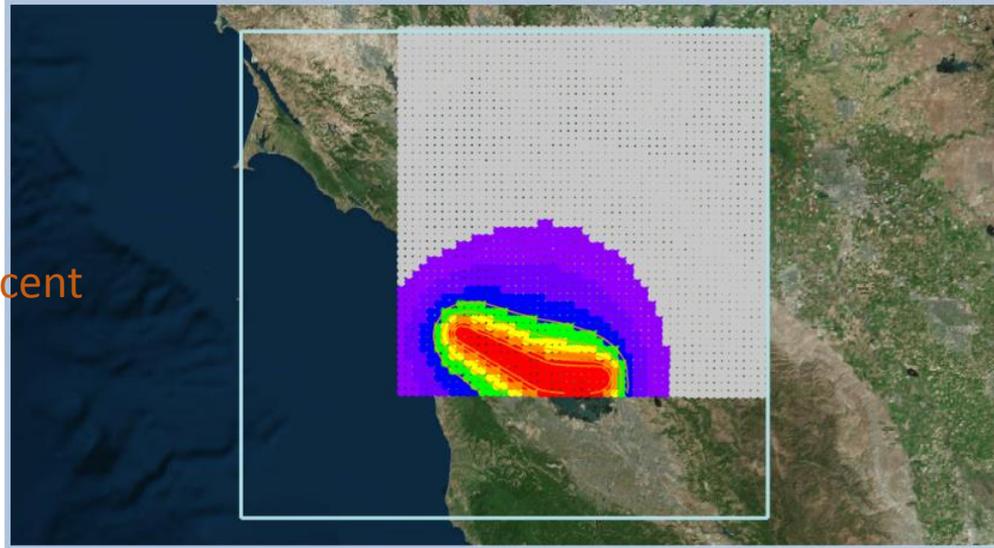
Really helpful!

Results Analysis: Emissions

- Detailed emission reports segment by segment can be the input to our climate model to analyze the aircraft global warming impact due to Ozone and Contrails.
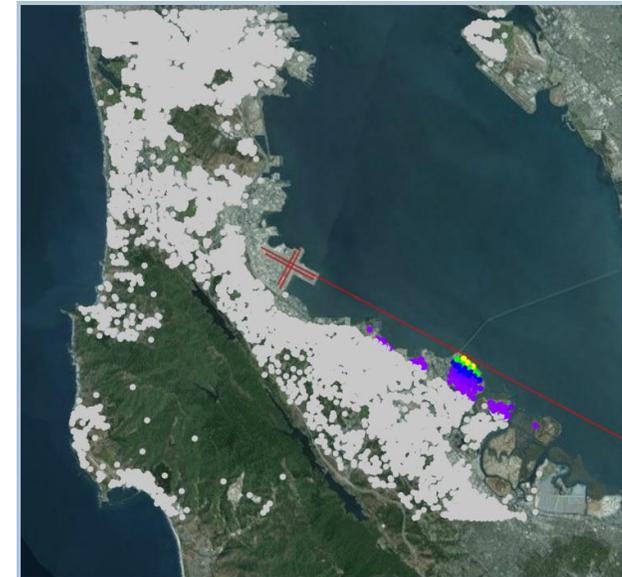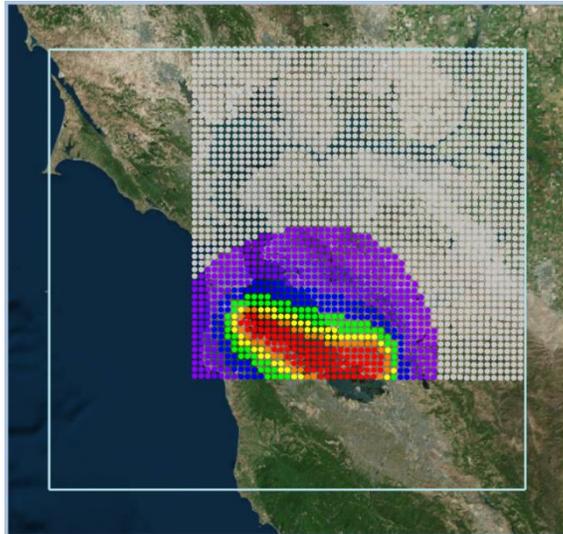
	CO2(kg)	NOx (kg)	PM2.5(g)
normal descent	1440.0	3.6	29
efficient descent	1120.0	3.1	22

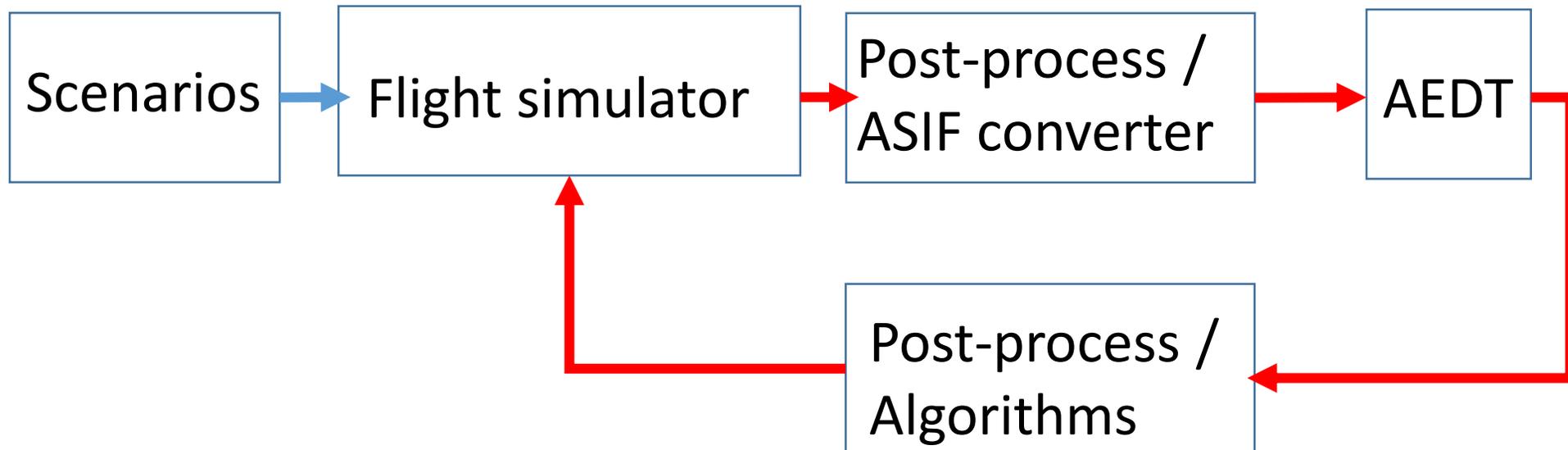# Results Analysis: Noise

Normal descent

Efficient descent

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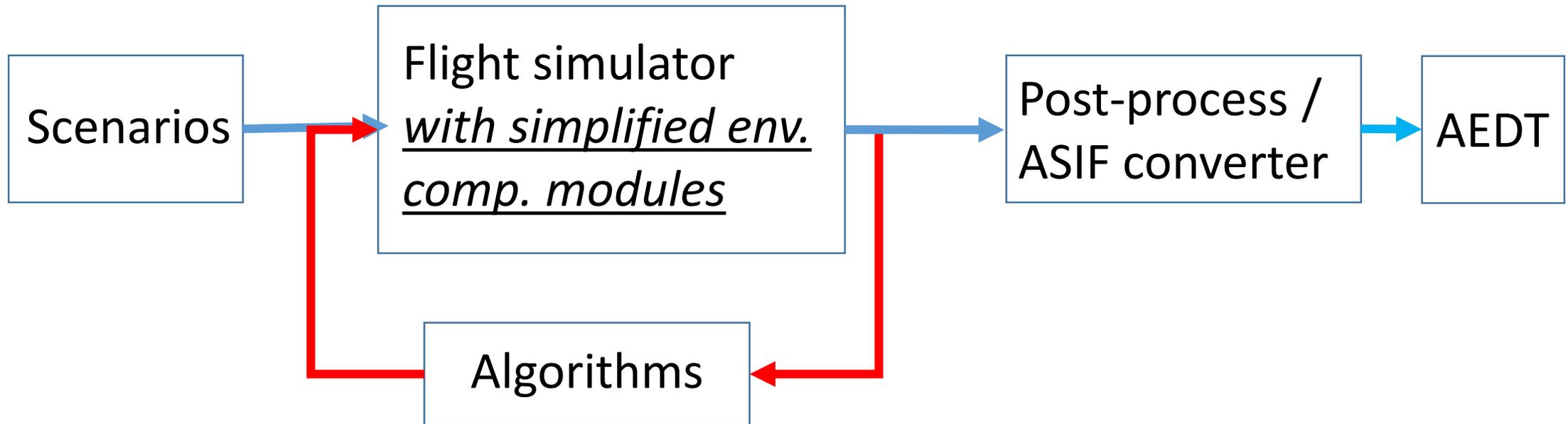• Design and assessment strategy

Design and Assessment

- Environmental-friendly ATM and Flight operations using AEDT2b. Way #1:

Design and Assess

- Environmental-friendly ATM/Flight operations using AEDT2b. Way #2:

Summary

- All-in-one integrated aviation environmental assessment tool
- Gate to gate simulation
- Can generate detailed reports
- Capable of running large scale global air traffic environmental impact analysis

Suggestions / Interested Features / Questions

- Could it be more user configurable?
  - Non-standard descent profile with recorded/customized flight performance data
  - More convenient for data loading (ETMS/ASDI, OAG, radar data | ASIF converter, direct database port)
- En-route flights (wind data integration, read flight plans)
- More details on running census noise exposure
- Contact: Jinhua Li (jinhua.li@nasa.gov)