

# On Generating Trajectories in Response to Dynamic Weather Systems Within an Airspace Planning and Collaborative Decision-Making Model (APCDM)

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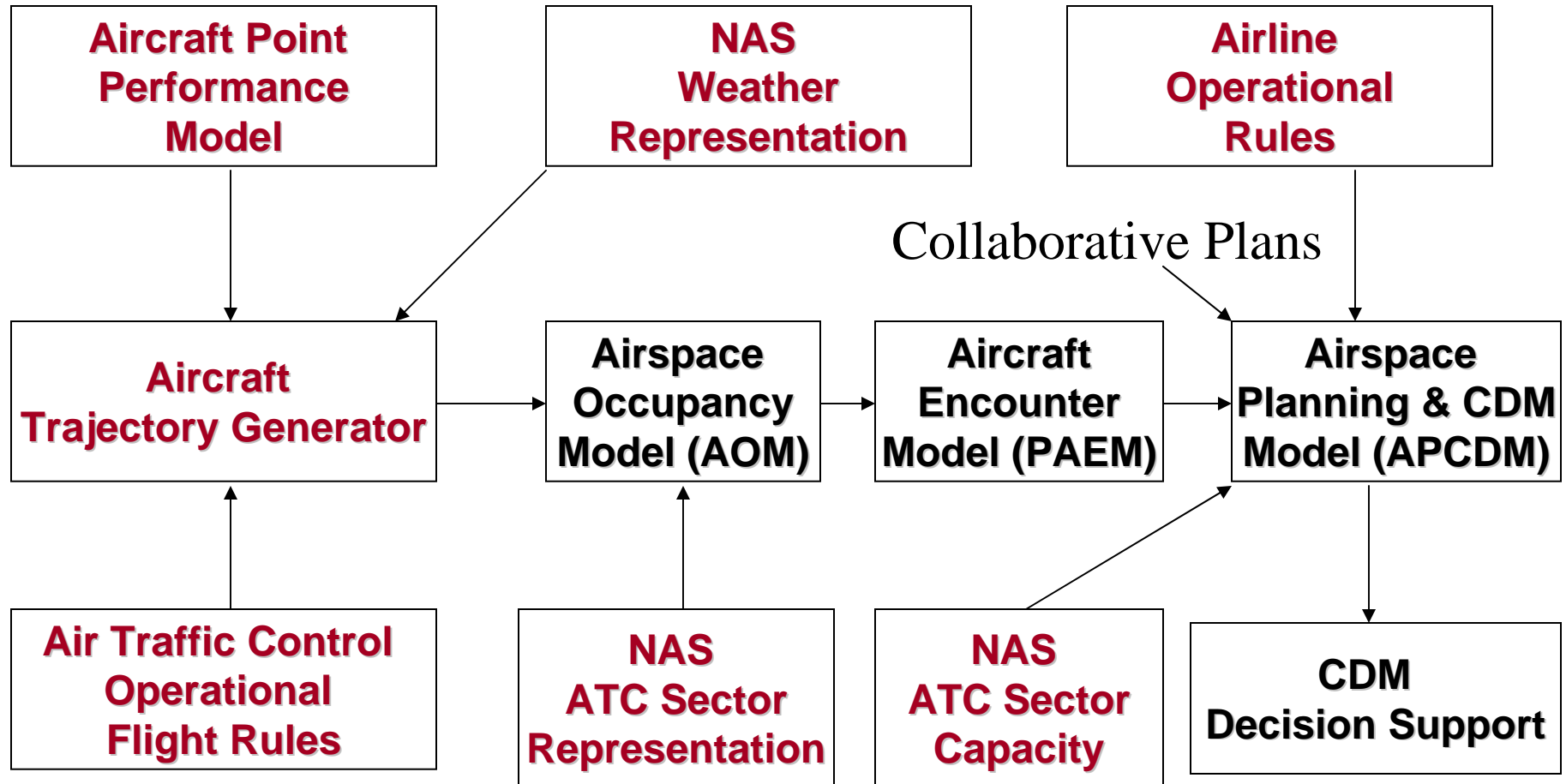
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# Research Goals

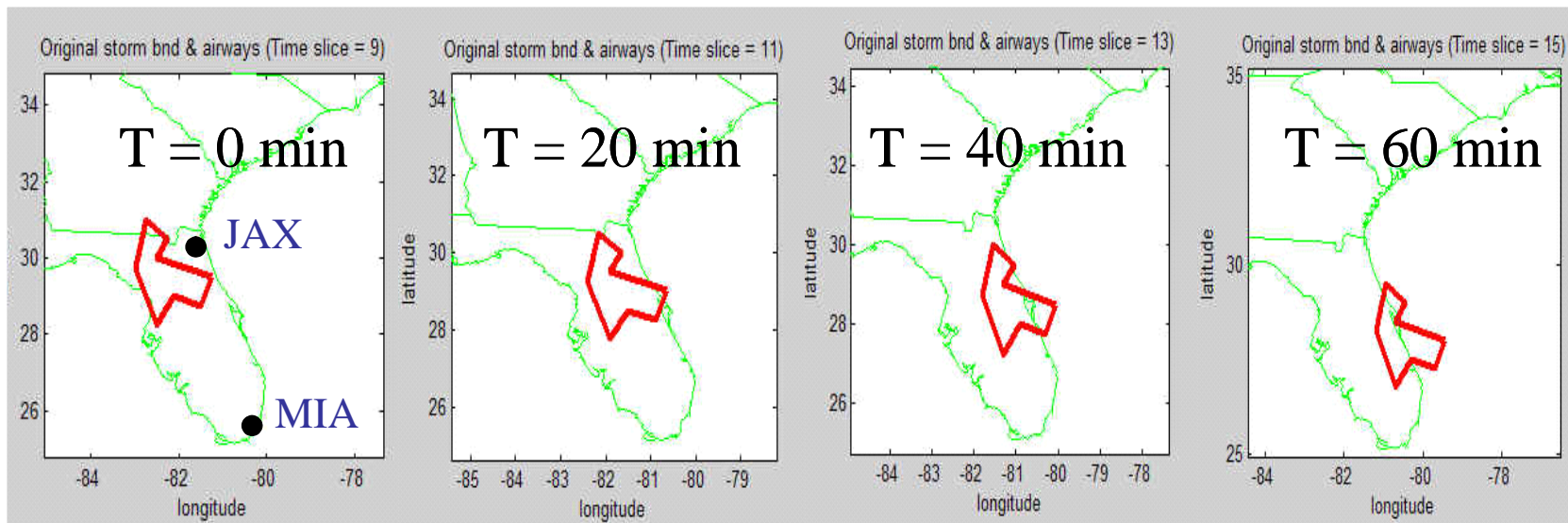
- To create **alternative surrogate flight plans** for given flights considering
  - Severe weather conditions, and
  - Aircraft performance.
- Each flight plan is generated in terms of a **flight trajectory** defining by a series of way-points between the origin and destination airports. Each way-point is represented as  $(x, y, z, t)$ .
- Resulting flight plans are used as basic input data for the model comprised of three-sub models:
  - AOM (Airspace Occupancy Model)
  - PAEM (Probabilistic Aircraft Encounter Model), and
  - APCDM (Airspace Planning and Collaborative Decision Making Model).

# Airspace Planning and Collaborative Decision Model (APCDM)



# An Example of a Flight Path Generation

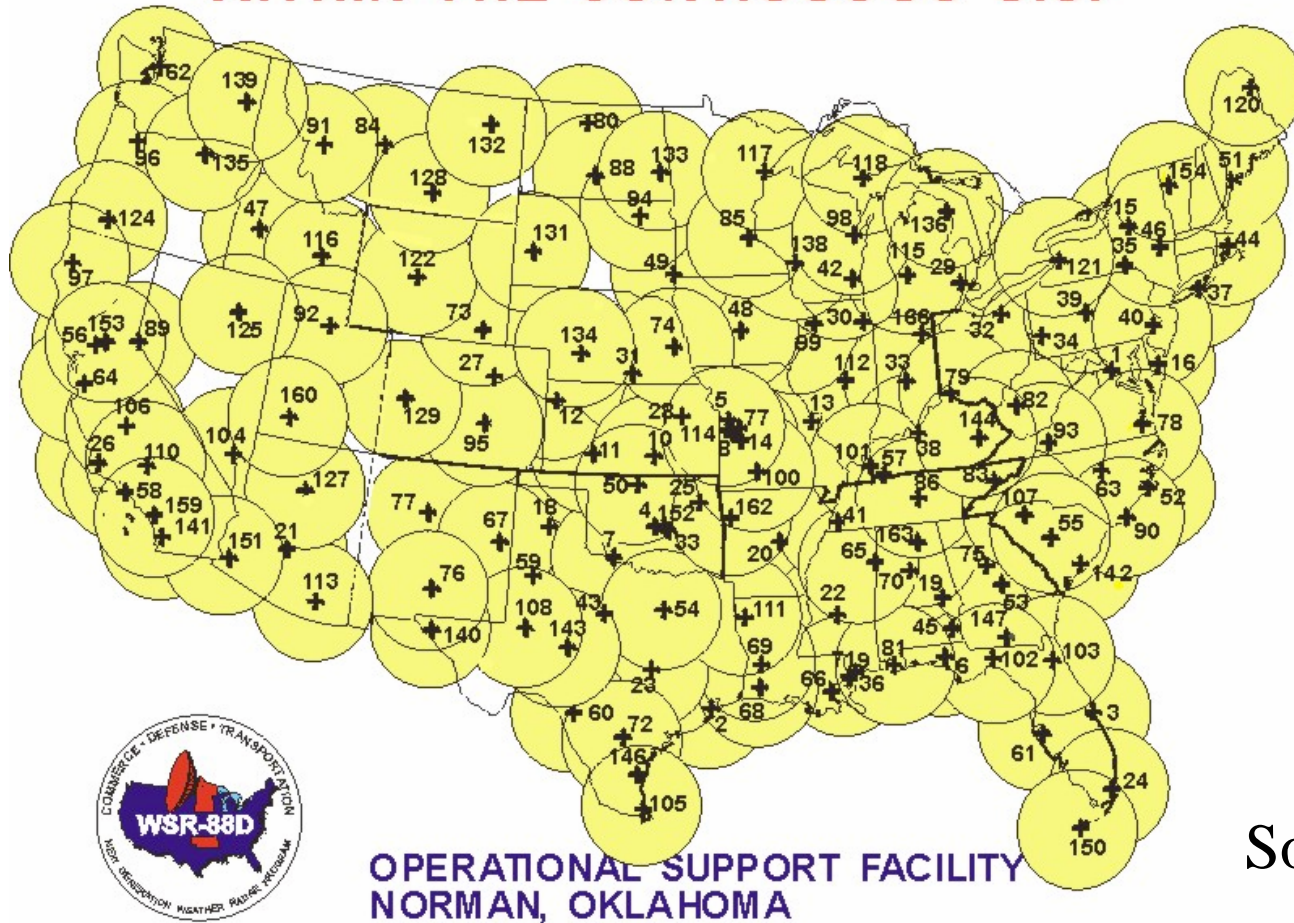
- Given:
  - A flight: JAX, FL → MIA, FL. (GCD: 282 nm)
  - Aircraft: Airbus 320 (loaded 80% of Payload).
  - Cruising Altitude: FL250.
  - Severe weather situation is expected for next 60 minutes.



- Find the best, and second to best flight path for the flight.

# How Do We Collect Weather Data?

## COMPLETED WSR-88D INSTALLATIONS WITHIN THE CONTIGUOUS U.S.



Source: NWS