# Airport Environmental

Presented to: REDAC Subcommittee on Airports By: Lauren Vitagliano Date: September 8, 2021



Federal Aviation Administration

# **Airport Environmental**

#### Research Co-Sponsored by:

- FAA Office of Airports, Planning and Programming
  - Planning and Environmental Division (APP-400)
- FAA Office of Environment and Energy
  - Noise Division (AEE-100)

#### **Airport Environmental Research Purpose:**

Explore ways to improve the environmental performance of airports while continuing to support community needs for efficient access to transportation services. This research develops effective analytical capabilities, such as data integration and digital tools, to improve airport decision making on infrastructure development plans. Consideration of sustainability, climate change, and resilience factors is needed to better integrate plans for effective outcomes. The users of these research products are FAA Environmental Protection Specialists, airports operators and industry stakeholders.



# Airport Environmental Current Projects

#### **Environmental**

Geospatial Environmental Map Tool (AppMap)

Future Climate Scenarios for Runway Length

\* Resilience at Vulnerable NPIAS Airports with Climate Change and Severe Weather

Budget			
FY21	FY22		
320K	1.2M		



# FAA AppMap

Centralized geospatial mapping tool to improve internal workflow, streamline planning/environmental process and support NEPA reviews.





# **FAA АррМар**

#### **Development Updates**

- New Data Tree Growth Eco-Regions
- Enhance querying capabilities – IFR Access
- Enhance User Interface





# FAA AppMap http://appmap.faa.gov





## Airport Environmental Research Future Climate Scenarios for Runway Length

- FAA evaluates runway length needs for civil airports using Advisory Circular (AC 150/5325-4B), which contains the runway length requirements for airplanes for a range of weights, runway conditions, temperatures, and airport elevation
- Future environmental changes in precipitation patterns (wet or dry) and average high temperatures might effect key inputs that were used to evaluate runway length
- A thorough understanding of future climate trends and their effect on aircraft performance are needed with an update to the AC's methodology

U.S. Department of Transportation

Federal Aviation Administration

Subject: RUNWAY LENGTH REQUIREMENTS FOR AIRPORT DESIGN

Date: 7/1/2005 Initiated by: AAS-100

Advisory

Circular

AC No: 150/5325-4B 5-100 Change:

1. PURPOSE. This Advisory Circular (AC) provides guidelines for airport designers and planners to determine recommended runway lengths for new runways or extensions to existing runways.

2. CANCELLATION. This AC cancels AC 150/5325-4A.

3. APPLICATION. The standards and guidelines contained in this AC are recommended by the Federal Aviation Administration strictly for use in the design of civil airports. The guidelines, the airplane performance data curves and tables, and the referenced airplane manufacturer manuals *are not to be used* as a substitute for flight planning calculations as required by airplane operating rules. For airport projects receiving Federal funding, the use of this AC is mandatory.

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David L. Bennett Director, Office of Airport Safety and Standards



# Airport Environmental Research Future Climate Scenarios for Runway Length

- Reviewed National Climate Assessment's Climate Resilience Toolkit
- Historical data analyzed
- Adjustment to AC was tested with case studies for 30 busiest airports

DOT/FAA/TC			
Federal Aviation Adr William J. Hughes T. Aviation Research D Atlantic City Internat New Jersey 08405	DOT/FAA/TC-xx/xx Federal Aviation Administration William J. Hughes Technical Center Aviation Research Division Allantic City International Airport New Jersey 08405	Future Climate Scenarios for Runway Length: Assessment Future Temperature and Precipitation Trends	of
		August 2021	
		Final Report	
		This document is available to the U.S. public through the National Technical Information Services (NTIS), Springfield, Virginia 22161.	
		This document is also available from the Federal Aviation Administration William J. Hughes Technical Center at actilibrary.tc.faa.gov.	
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		U.S. Department of Transportation Federal Aviation Administration	



Airport Environmental Research \*New Research\*

# Resilience at Vulnerable NPIAS Airports with Climate Change and Severe Weather

Duration – 5 year study (at least) Budget - \$1.5mil (to start) Support – Volpe Research Center



#### **Background**

- *Flooding* 13 of the Nation's 47 largest airports have at least 1 runway within reach of moderate to high storm surge.
- Permafrost Collapse AK relocated 1 airport, others in danger
- Climate Change "sunny day" flooding
- Sea Level Rise Micronesia needs near term solutions

# Plans are needed to address short-medium term and long term scale.



# **EXECUTIVE ORDERS**

EO 14008 of January 27, 2021 – Tackling the Climate Crisis at Home and Abroad

EO 14030, Climate-Related Financial Risk, (reinstating Executive Order 13690 of January 30, 2015) 86 FR 27967 (May 25, 2021).

\*Mandate development of climate action plan and evaluation of flood risks.



#### <u>Purpose</u>

- Develop prioritized, risk-based recommendations for how FAA and airport operators can address climate change and severe weather impacts.
- Develop tools that will help FAA determine which airports are the most vulnerable

FAA/AEE Climate Action Plan submittal to U.S. Department of Transportation (March 11, 2021): *"The FAA does not currently have a formalized process in place to evaluate facilities."* 



#### FAA Role in Micronesia

- FAA currently provides technical, navigational, airspace and AIP funding support for airports under the Compacts of Free Association and in American Samoa.
- Compacts apply to the Federated States of Micronesia (FSM), Republic of the Marshall Islands (RMI), and Palau.
  - These three are the Freely
    Associated States (FAS)







#### MAJURO INTERNATIONAL AIRPORT

## PAGO PAGO INTERNATIONAL AIRPORT

U.S Army Kwajalein Atoll Garrison, Ronald Reagan Ballistic Missile Test Site (USAKA)



## Work Plan

- **1.Inventory Airport-Related Vulnerable Assets**
- 2.Incorporate Resilience Data into Existing FAA Tools (AppMapp, ATO NISIS)
- **3.Complete System-Level Studies of Vulnerable Airports**
- 4.Conduct Case Studies at Specific Airports
- 5.Develop Framework for a Sustainability Resilience Pilot Program



## <u>Work Plan – Inventory Airport Related Vulnerable</u> <u>Assets</u>

- ID and prioritize the regions where flooding and erosion are most likely to trigger asset damage and operational loss of use.
- Apply climate scenarios over one or most scales (10,20,30, 40, years) based on National Climate Assessment hazard info
- Delineate airport-related assets in regions exposed to flooding/erosion due to permafrost loss



## Work Plan – Incorporate Resilience Data into Existing FAA Tools

- ID Tools and datasets to add resilience-related data; NAS Integrated Status Insight System (NISIS)
- ID data gaps for future research prepare recommendations about the types of resilience data that are useful to integrate into FAA tools
- Develop approach for integration



#### <u>Work Plan – Complete System-Level Studies of</u> <u>Vulnerable Airports</u>

• Alaska, Micronesia – to ID airports for further case study.

\*multiple high-risk airports where collaboration between various levels of government & military is critical\*



## <u>Work Plan – Conduct Case Studies at Specific</u> <u>Airports</u>

- Screening criteria for additional case studies factors like:
  - elevated spending, diverse locations, resilience strategy, hub/GA/freight, applicability to airports nationwide
- Perform case studies based on the above ranking criteria.
  - Analysis



## Work Plan – Develop Framework for a Sustainability Resilience Pilot Program

- Best practices for Pilot program framework.
- Would assist airports with conducting resilience pilots in repeatable and effective manner.
- Would address projected impacts over varying timescales and scenarios



## Next Steps:

- Complete contracting FY21
- Initial Project Management Plan 30 days NTP
- Work Plan 60 days NTP



# **Questions?**

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