FOTO35
Future of the Ocean 2035

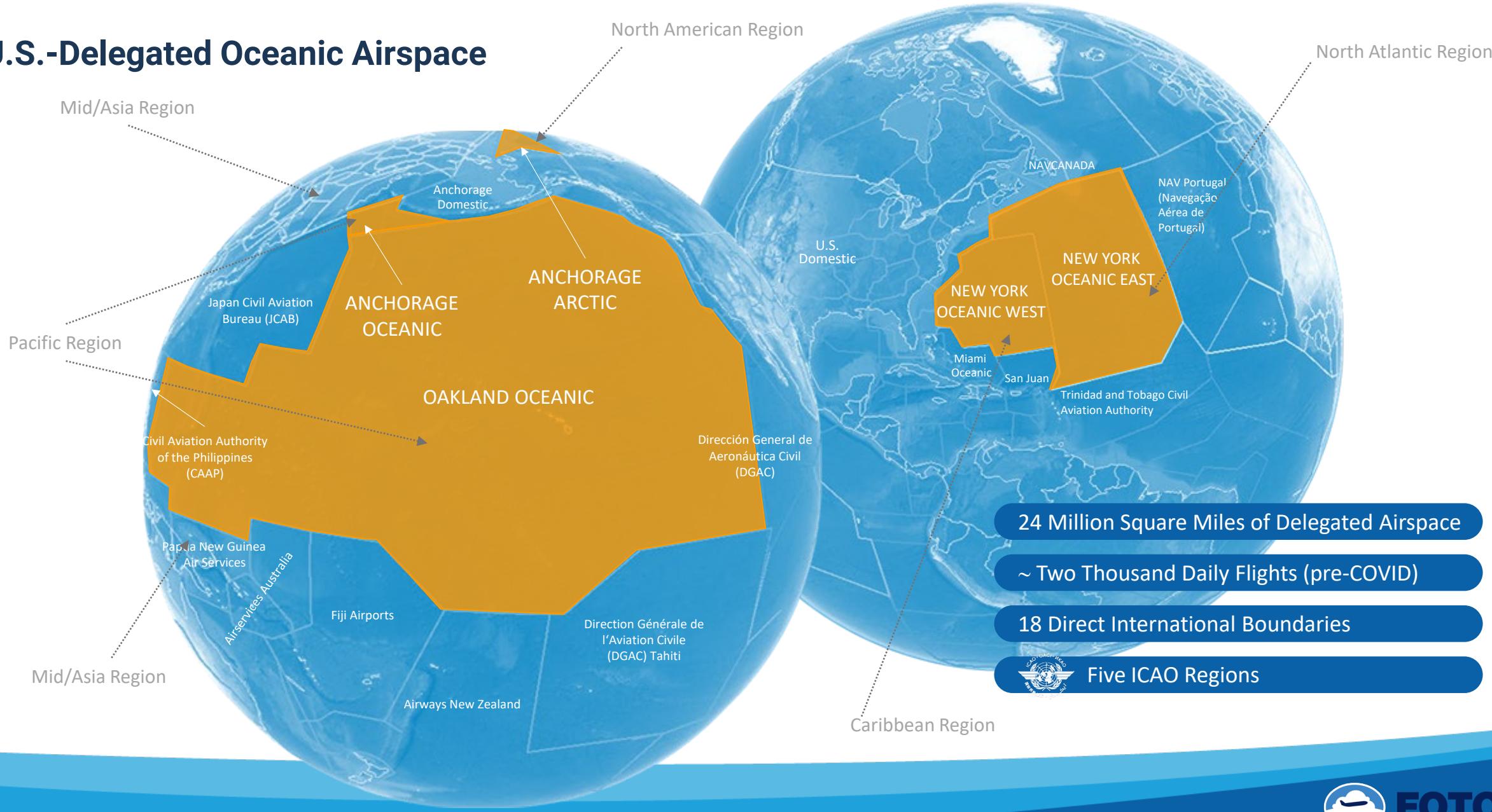
CROSS POLAR WORKING GROUP & FUTURE OF THE OCEAN 2035 (FOTO35)

Program Overview

September 15, 2021

Federal Aviation Administration

U.S.-Delegated Oceanic Airspace



- 24 Million Square Miles of Delegated Airspace
- ~ Two Thousand Daily Flights (pre-COVID)
- 18 Direct International Boundaries
- Five ICAO Regions

OCEANIC SHORTFALLS *and* SOLUTIONS

	Efficiency, Predictability, and Productivity	Capacity and Flexibility	Seamless Operations	Resilience	Environment
Shortfalls	Unable to file and fly preferred altitudes, routes, and/or trajectories Inefficient arrivals/departures	Inability to integrate emerging users & space operations Lack of integrated flow management during capacity/demand imbalances	Flights not able to transition smoothly as they cross international boundaries	Improve operational continuity during emergency scenarios and system outages	Lack of integrated flow management during capacity/demand imbalances between domestic and oceanic domain increases fuel burn
Solutions	✓ Seamless end-to-end solution ✓ Enhanced trajectory-based oceanic control with Four-Dimensional Trajectory (4DT) collaborative decision making ✓ Situational awareness ✓ Real-time surveillance	✓ Automate, to the extent possible, emerging user air traffic services ✓ Enhanced oceanic separation procedures	✓ Integrated domestic and oceanic trajectories ✓ Air Navigation Service Provider (ANSP) data sharing	✓ Improved Air Traffic Management (ATM) automation system which increases resiliency, adaptability, and enables portability during emergencies	✓ Integrated domestic and oceanic trajectories ** These are just a few of the current oceanic shortfalls identified by FOTO35. There are 32 total shortfalls identified.*

FOTO35 PROGRAM GOALS

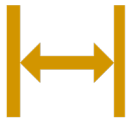
Implement Dynamic End-to-End Trajectory Operations (DETEOps)

Realize efficiencies achieved by:

- Improved procedures for processing flight plans
- More frequently updated trajectories
- Leveraging weather and cost-index data

Safely Integrate Emerging Users & Space Operations

Automate input of all emerging user and space operations data, including airspace use, planning and coordination. Establish policies, procedures and technologies to effectively integrate all users.



Enhance Oceanic Separation Procedures

Improve operational safety and efficiency

- Horizontal-radial separation procedures
- On-demand tactical maneuver capability
- Efficient management of pair-wise aircraft performance differences

Implement real-time, low-latency voice communications and enhanced surveillance

Implement Improved Oceanic ATM Automation

Implement automation capabilities, such as machine learning, to improve seamless, efficient and safe oceanic operations. More agile development of functionalities for ATC and users.

Increase ATM system resiliency.

FOTO35 OUTCOMES

	Dynamic End-to-End Trajectory Operations (DETEOps)	Enhanced Oceanic Separation Procedures	Integrate Emerging Users & Space Operations	Improved Oceanic ATM System
Near Term	• Conduct stakeholder outreach programs • Achieve concept consensus with industry, international ANSP partners and FAA domestic/offshore operations • Assess user needs • CONOPS • Conduct limited operational trials	• Achieve safety/efficiency gains in specific oceanic scenarios • Implement reduced separation standards and enhanced procedures, such as tactical on-demand operations	• Conduct stakeholder outreach programs • Assess user needs • Perform an emerging user operator data sharing assessment	• Conduct stakeholder outreach programs • Complete requirements for readiness decision and investment analysis and readiness decision • Engage industry and ANSPs
Mid Term	• Finalize procedures and system requirements in collaboration with industry	• Develop and introduce improved technology and procedures based on performance requirements to safely reduce separation standards	• Increase emerging user services • Socialize with industry • Conduct trial data connections	• Complete final investment analysis • Continue to engage industry and ANSPs
Long Term	• Implement global optimized dynamic end-to-end trajectory operations	• Continue to implement reduced separation standards and enhanced procedures	• Safely integrate new entrants in FAA oceanic operations and continue industry outreach	• Conduct trials, tests and implementation

FOTO35 IMPROVEMENTS AND EFFICIENCIES

Implement Dynamic End-to-End Trajectory Operations (DETEOps)

- Fly closer to desired profiles
- Optimized flight plans
- Reduced fuel burn, carbon emissions/time
- Real-time data enables ability to modify flight plans/ optimized flights
- More predictable flight times
- Less Delays

Safely Integrate New Entrants & Space Operations

- Enhances services for non-conventional users
- Increases controller situational awareness
- Increases automation of non-conventional user operational data

Enhance Oceanic Separation Procedures

- Allows more flexibility during conflict/deviation scenarios
- Maximizes benefits to all system operators based on equipage
- Increases accommodation and resolution of critical aircraft contingency scenarios
- Improves departure/arrival ATC services into remote oceanic airports

Implement Improved Oceanic ATM System

- Increases operational efficiencies
- Enables DETEOps & On-Demand Tactical Operations
- Safety with improved outage detection/ improved conflict resolution capabilities
- Reduces interface complexity/ controller workload
- Increases compatibility with other systems
- Increases resiliency, adaptability, and enables portability during emergencies

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We appreciate your support.

For more information contact

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