Overview

• Overall History
• Airport Life – My Story
• September 20, 2017
• From Surviving to Resiliency
• Lessons Learned
• PR Climate Change Council
• PR Resiliency Commission
• Moving Forward
Puerto Rico

- Located in Caribbean Region
- Commonwealth of the United States
- 3.5 million American Citizens (61% live in coastal communities)
- Coastline: 799 mi / 1,225 beaches (60% moderate to severe erosion)
- Built up coastline: 24%
- 81 industrial parks on the coast
- Shallow coral reef designated for protection: 49%
- Marine protected areas: 27.2%
Central Mountain Range (3,500 – 4,300 ft)
Hurricane Hugo – 1989 (Cat 3-4)

Category 4, SC landfall
135 mph wind, 935 mb pressure

Category 3, Puerto Rico
120 mph wind, 958 mb pressure

Category 5
160 mph wind, 918 mb pressure

Category 1
75 mph wind, 994 mb pressure
Hurricane Georges – 1998 (Cat 3)
Hurricane Irma – 2017 (Cat 5)
Hurricane Maria – 2017 (Cat 4-5)
SJU Airport

- First major Public Private Partnership in Puerto Rico and of any Category X Commercial Airports in the mainland US
- Managed by Aerostar Airport Holdings, LLC since February 2013
- Approximately 11,000,000 passengers moved per year
- Coastal airport with SLR related impacts
SJU Airport Resiliency Components

Targeted Plans:

• Emergency Management Plan
• Hurricane Plan
• Operational Areas Inspection Plan
• Spill Prevention Control and Countermeasures Plan
• Stormwater Pollution Prevention Plan
• Business Continuity Plan (In process)
SJU Airport Resiliency Components

Practice, Actions, and Leadership:
• Tabletop Exercises
• Quarterly Drills
• Tri-Annual Live Event
• Monthly Stakeholder Meetings
• Routine Maintenance of Critical Equipment
• Understanding of Critical Infrastructure
• Committed and Organized Team
## SJU Airport Resiliency Components

<table>
<thead>
<tr>
<th>Significant Issue</th>
<th>Adverse Effect</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>Power outage (entire Island)</td>
<td>- No HVAC (significant heat)</td>
<td>- Redundancy – emergency generators</td>
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<td></td>
<td>- Limited illumination in areas</td>
<td>- Staff assisted passengers</td>
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<td>- TSACheckpoint failure</td>
<td>- Adaptive management</td>
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<td></td>
<td>- Condensation in floor</td>
<td>- Safe corridors</td>
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<td>Communications failure (FAA radar, radios, mobile phones)</td>
<td>- Limited and cancelled commercial flights</td>
<td>- Meetings, meetings, meetings</td>
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<tr>
<td>Debris, flooding, and water damage in multiple locations</td>
<td>- Limited operational areas</td>
<td>- Continued orientation to passengers</td>
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<tr>
<td></td>
<td>- Mold</td>
<td></td>
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<tr>
<td>Downed trees and perimeter fence</td>
<td>- Security and compliance</td>
<td>- Interagency agreements to address</td>
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<tr>
<td></td>
<td>- Blocked access</td>
<td></td>
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<tr>
<td>Waste management</td>
<td>- Accumulated waste in sterile areas and in main dumpster zone</td>
<td>- Adaptive management (alternate routes, storage areas, heavy machinery, and “collaboration”)</td>
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<td>Emergency Medical Response</td>
<td>- Not enough resources to manage potential threats</td>
<td>- Set fixed EMS stations</td>
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<td></td>
<td>- Communication limitations</td>
<td>- Law enforcement support</td>
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<td></td>
<td>- Heat strokes</td>
<td></td>
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<tr>
<td>SJU was perceived as a shelter (food and water)</td>
<td>- Potential for vandalism</td>
<td>- Proactive communications</td>
</tr>
<tr>
<td></td>
<td>- Affected operations</td>
<td>- Limited water and food provided</td>
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<tr>
<td>Personal matters, emotional health, and physical fatigue</td>
<td>- Employee depression and desperation</td>
<td>- Teamwork approach and delegation</td>
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<tr>
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<td>- Potential mistakes / risk</td>
<td>- Aerostar headquarters adopted a “home” environment</td>
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<tr>
<td></td>
<td>- Affected operations</td>
<td>- Family support (water, gasoline, special assistance, daycare)</td>
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<tr>
<td>Back to “normal” operations</td>
<td>- Lack of reliable / stable electricity</td>
<td>- Development of “standard” alternative plans</td>
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<td>- Emergency management all over again (2-5 times per week)</td>
<td>- Adaptive management</td>
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<td>- Waste management, TSA, access, checkpoint, condensation, etc</td>
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Lessons Learned

• Develop Plans
• Study and Understand your Facility (applies also to community and environment)
• Practice, Learn, Modify, and Practice Again
• Adaptive Management (flexible) with Structure (organized)
• Lead by Example and Motivate
• Build strong Teams (internal and external)
• Take Care of Employees and Operational Team
• Celebrate Success (Mission Accomplished 24 / 48)
Puerto Rico Climate Change Council

Mission

...assess the state of Puerto Rico’s climate, using the best science and knowledge available, understand our social-ecological vulnerabilities and develop adaptation strategies to build a resilient society.
PRCCC – Volunteer Partners
PRCCC – Before and After Hurricane Maria

• Created in 2009 as a collaborative effort after two failed attempts at high levels of government (Executive Order in 2008 and Law in 2009)
• Led by Ernesto Diaz, CZM Program at PRDNER, and funded by NOAA (vision and initial strategy included NOAA Coastal Fellow to fill information gaps)
• Currently gathers 150 professionals in engineering, architecture, science, sociology, and other, from government, academia, non-profit organizations, and private industry.
• Collaboration via email (daily) and 1 yearly summit
• Small seed investment has achieved documentation equivalent to millions ($)
• Most recent achievement: US Caribbean to have a “stand alone” section in 4th National Climate Assessment Report
PRCCC – Before and After Hurricane Maria

• Road to Resilience Adaptation Guide – Published in 2014: Focused on Island, Municipal, Community, and Individuals as disaster response and recovery responsible

• Road to Resilience Part 2 – After 2014 extreme drought and 2017 hurricanes: Refocuses on Individuals, Neighborhood, and Community as disaster response and recovery leads (via community based groups, religious organizations, and private industry)
Resilient Puerto Rico Advisory Commission

Created in November 2017 as an independent and inclusive body. Locally led, and supported by The Rockefeller Foundation, the Open Society Foundations, and the Ford Foundation, the Commission’s project, ReImagina Puerto Rico (RePR or ReImagina), developed recommendations to help rebuild Puerto Rico in a way that makes the island stronger – physically, economically, and socially – and more prepared to confront future challenges. The intent of the recommendations is to support Congress, federal agencies, and the local government and municipalities in their efforts to drive long term recovery on the island.

• The Commission is independent, non-partisan, non-governmental, and receives no public funding.

• Working groups were composed of local and external experts focused on strategic matters.
ReImagina Project

- 6 Working Groups:
  - Economic Development
  - Energy
  - Housing
  - Physical Infrastructure
  - Natural Infrastructure
  - Health, Education and Social Services
- 18 Working Group Sessions
- Community Involvement (including children)
- Stakeholder Involvement (Press, Executives, Other)
- Town Hall Meetings

www.resilientpuertorico.org