



ICAO SEMINAR ON GREEN AIRPORTS

ATHENS, GREECE | APRIL 18-19, 2024

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Session 4: Taking Flight Towards Climate Resilience:
Building Adaptation Strategies for Airports

ICAO work on Climate Adaptation and Resilience

ICAO work on Climate Adaptation and Resilience

Contents:

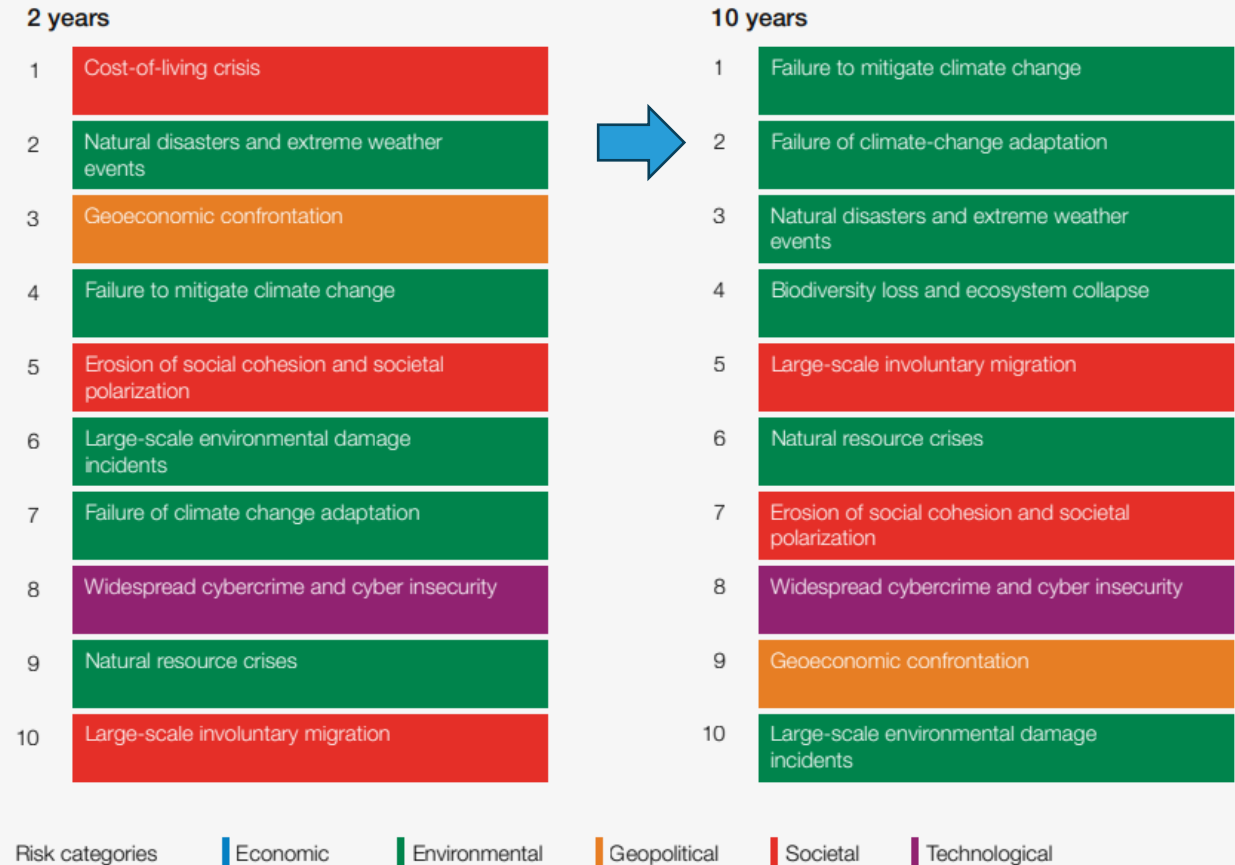
- Background and context;
- ICAO CAEP work on climate adaptation and resilience

Background and Context: Climate Adaptation and Resilience

- **The Global Risks Report 2023** published by the World Economic Forum (WEF)
 - Highlights that climate and environmental risks will take center stage in global risk perception over the next decade;
 - Top 10 risks over the short term and long term, clearly indicates that **climate change adaptation will rank as the second most crucial risk in the next 10 years.**

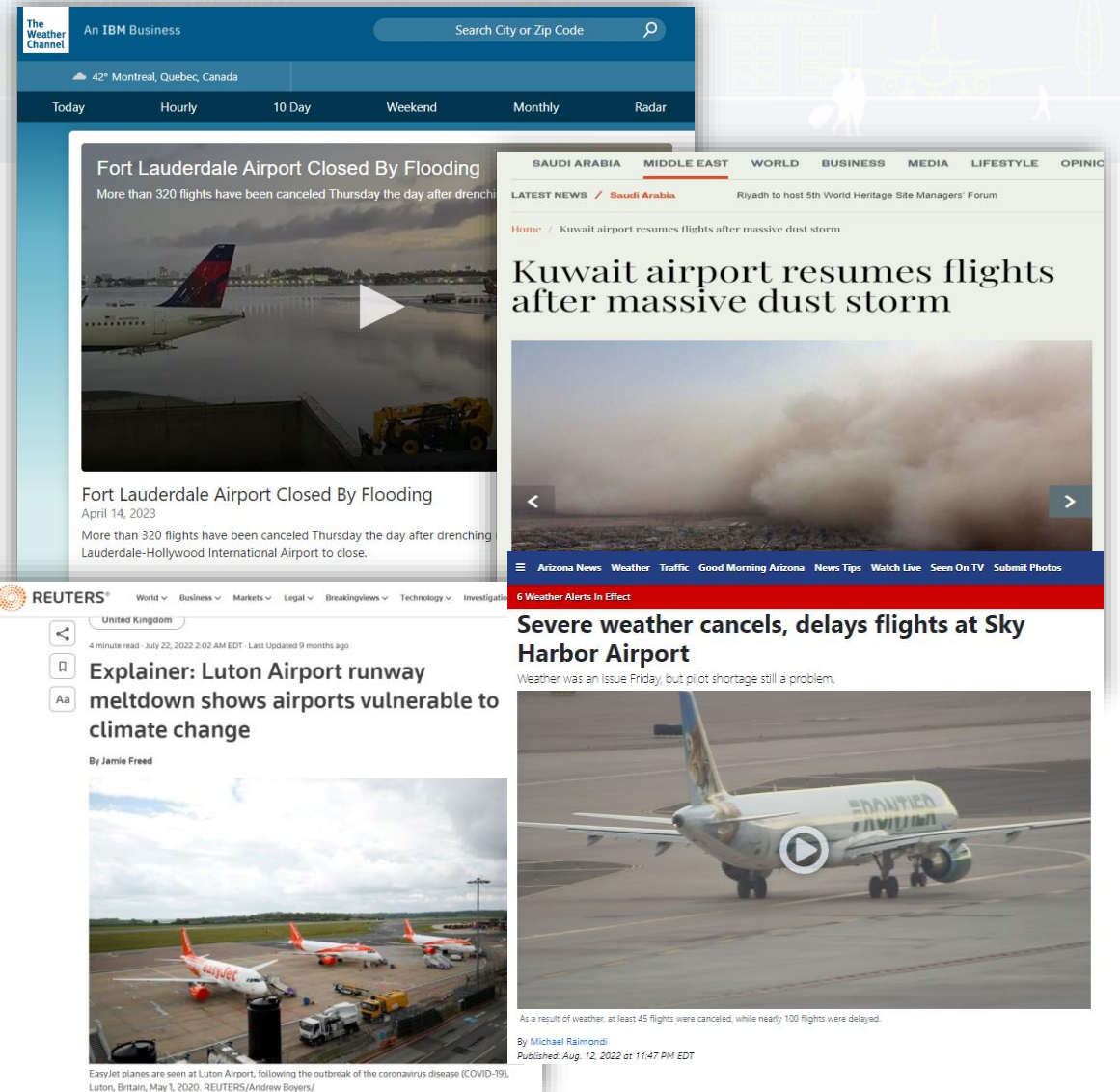
Global risks ranked by severity over the short and long term

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"



Background and Context: Climate Adaptation and Resilience

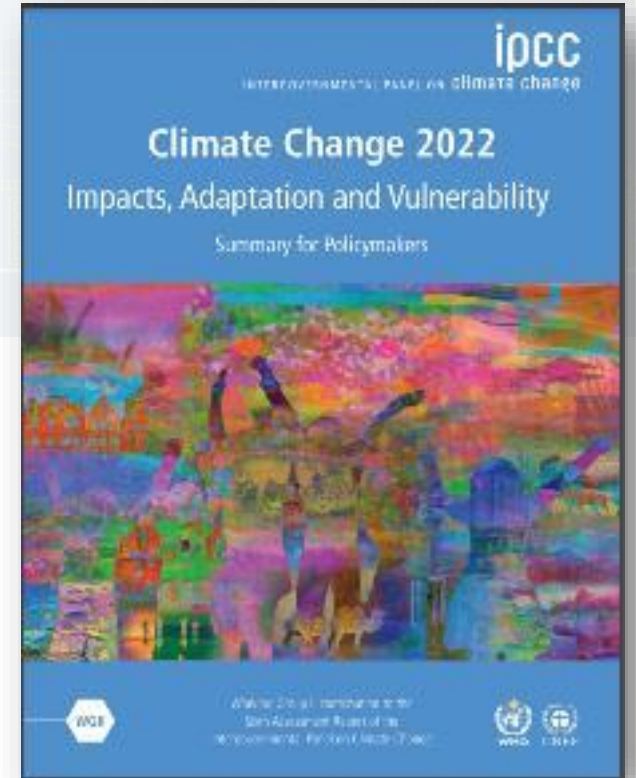
- Extreme weather events caused by the climate change pose a real and increasing **risk to the global aviation industry**;
- Aviation stakeholders already experiencing its impacts in the form of:
 - increased intensity of storms;
 - higher average and extreme temperatures;
 - sea level rises;
 - changes in rain, snow, wind, and storm patterns;
 - desertification, sand and dust storms;
 - more frequent and persistent droughts and wildfires.



Background and Context: Climate Adaptation and Resilience (IPCC WG2)

IPCC Working Group II contribution to the Sixth Assessment Report:

- ✓ assesses the impacts of climate change, looking at ecosystems, biodiversity, and human communities at global and regional level
- ✓ reviews vulnerabilities and the capacities and limits of the natural world and human societies to adapt to climate change
- ✓ reveals that global action on adaptation and mitigation needed now to secure a liveable and sustainable future for all



- Many airports are in the low elevation coastal zone, vulnerable to flooding and sea level rise.
- Under a 2°C scenario, **the number of airports at risk of storm surge flooding increases from 269 to 338 or as many as 572 in the highest emissions no-policy baseline scenario, these airports are disproportionately busy and account for up to 20% of the world's passenger routes** (Yesudian and Dawson, 2021)

Source: <https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/>

ICAO SEMINAR ON ICAO Assembly Resolutions on Climate Change

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Resolution A38-18 (2013) Paragraph 33. Requested Council:

- to **monitor and disseminate relevant information** on the potential impacts of climate change on international aviation operations and related infrastructure, in cooperation with other relevant international organizations and the industry;

Resolution A39-2 (2016) Paragraph 19. Requested Council:

- to identify the potential impacts of climate change on international aviation operations and related infrastructure and **identify adaptation measures to address the potential climate change impacts**, in cooperation with other relevant international organizations and the industry;

Resolution A40-18 (2019) Paragraph 26. Requested Council:

- to identify the potential impacts of climate change on international aviation operations and related infrastructure, identify adaptation measures to address the potential climate change impacts **and develop guidance on climate change risk assessment for international aviation**, in cooperation with other relevant international organizations and the industry

Resolution A41-21 (2022) Paragraph 29. Requested Council:

- to identify adaptation measures to address the potential climate change impacts and **maintain and enhance guidance on climate change risk assessment and adaptation measures** for international aviation, in cooperation with other relevant international organizations and the industry

ICAO Work on Climate Change Adaptation (timeline)

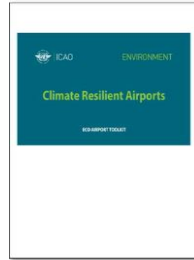
ICAO Joint Support Committee (JSC)

Scoping Study On The Possible Effects Of Climate Change On Air Navigation Services Over The North Atlantic (2015)

Airport Planning Manual Part II — Land Use and Environmental Management



Eco-Airport Toolkit e-publication on Climate Resilient Airports



WMO Statement on the State of the Global Climate in 2018



ICAO Climate Risk Assessment, Adaptation and Resilience Guidance (2022)



2013

2015

2016

2018

2019

2022

2023

38th Session of ICAO Assembly

Assembly Resolution A38-18

39th Session of ICAO Assembly

Assembly Resolution A39-2

ICAO Climate Adaptation Synthesis Report (2018)



40th Session of ICAO Assembly

Assembly Resolution A40-18

41st Session of ICAO Assembly

Assembly Resolution A41-21

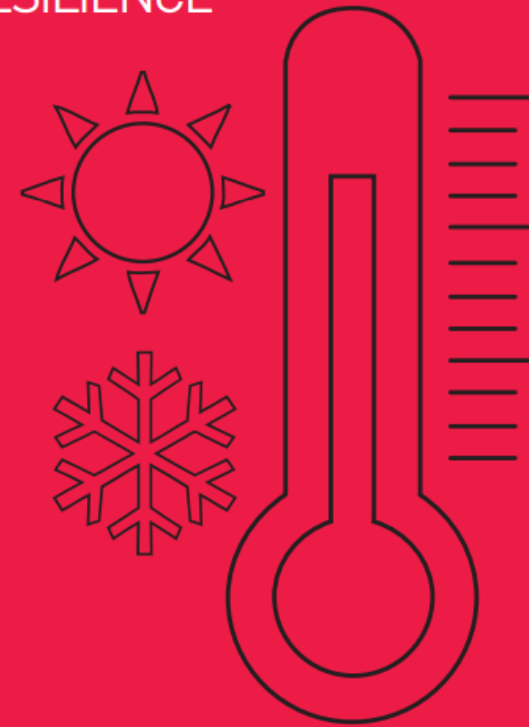
ANC Talks on Adaptation and Clear Air Turbulence

ICAO Work on Climate Change Adaptation

In response to A38-18 (2013):

- ICAO began investigating the effects of climate adaptation
- The Secretariat supported the initiative by the ICAO Joint Support Committee to examine potential impacts of climate change on aviation navigation services over the North Atlantic
- The Secretariat worked with Member States to develop the scoping study report
- Impact and Science Group (ISG) of Committee on Aviation Environmental Protection (CAEP) reviewed the scoping study report
- In 2016, it was decided to CAEP would conduct the necessary research and get an understanding of the environmental impacts of climate adaptation

CLIMATE CHANGE ADAPTATION AND RESILIENCE

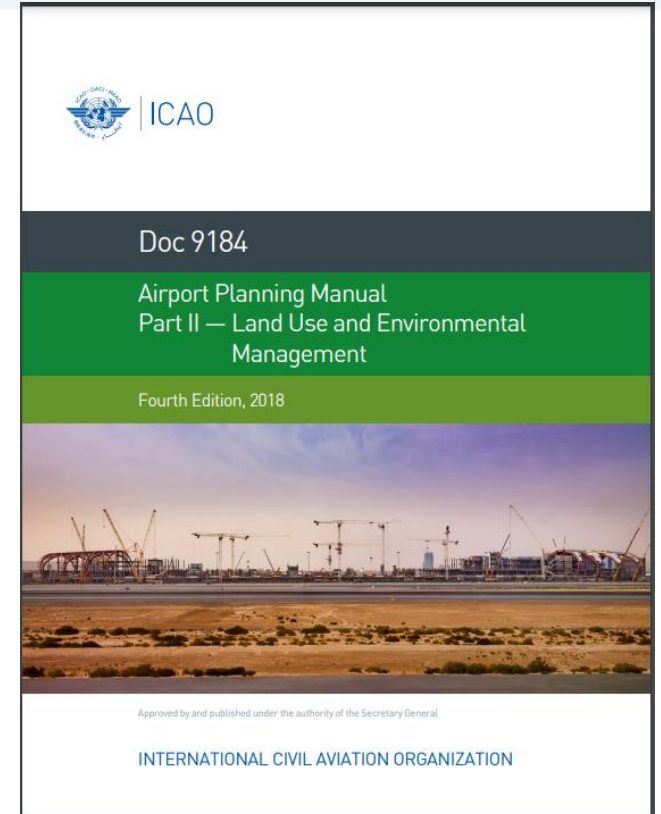


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ICAO Work on Climate Change Adaptation

Update to the Airport Planning Manual, Part 2 (ICAO DOC 9184):

- During the CAEP/9 cycle (2010-2013), Committee on Aviation Environmental Protection (CAEP) updated the Airport Planning Manual, Part 2
- The update included elements on eco-friendly airport planning and best practices in land-use planning and management
- During the CAEP/10 cycle (2013-2016) the group tasked to conduct the full review of the document
- Three new Chapters added:
 - Chapter 4 on “ Infrastructure for Environmental Management”
 - Chapter 8 on “ Heritage Considerations” and
 - Chapter 9 on “ Climate Change Resilience and Adaptation”
- In addition to new Chapters, the manual was updated to include revisions throughout the document, in particular
 - Appendix 2 “Cases of Effective Land Use Management Around Airports” and
 - Appendix 3 “Fact Sheets on land-use planning measures related to airports”



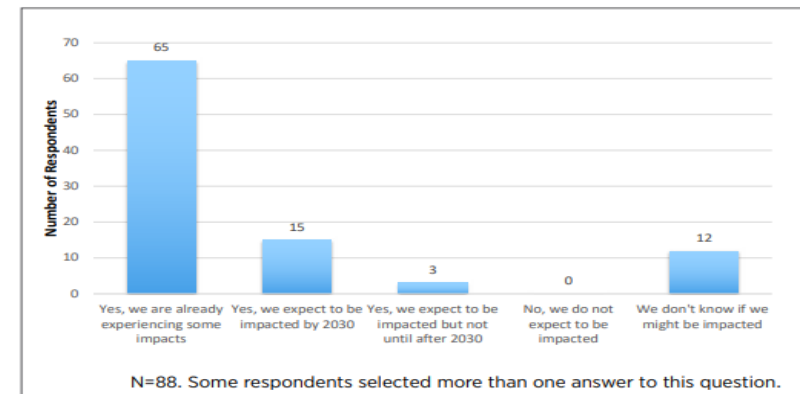
ICAO Climate Adaptation Synthesis Report (2018)

In response to A39-2 (2016):

- ICAO Climate Adaptation Synthesis Report, developed by CAEP, synthesizing existing information on the range of projected climate impacts on the aviation sector to better understand risks for:
 - airports, air navigation service providers (ANSPs), airlines, and other aviation infrastructure
- Survey conducted to gather input from States and aviation organizations (**65 out of 88 responses survey respondents are already experiencing climate change**)
- The impacts which most respondents expect to be the biggest challenges were:
 - increased intensity of storms (42 respondents),
 - changing precipitation (38 respondents), and
 - higher average and extreme temperatures (35 respondents)



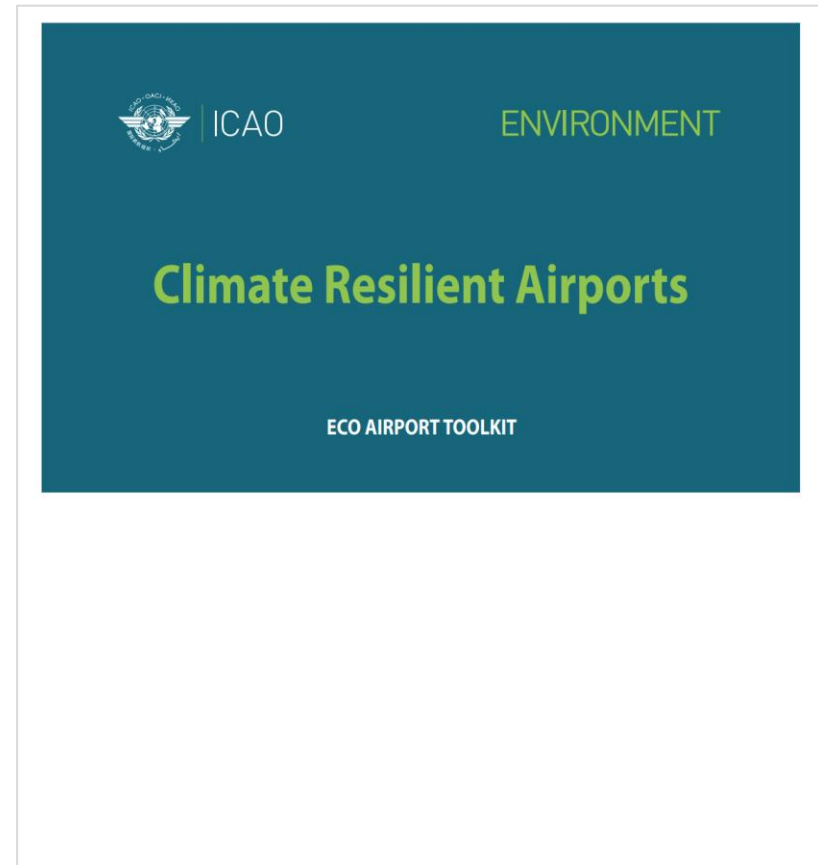
FIGURE 1: Q1 - Do you expect to be impacted by climate change now or in the future?



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Climate Resilient Airports (2018) – Eco Airport Toolkit
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Contents include:

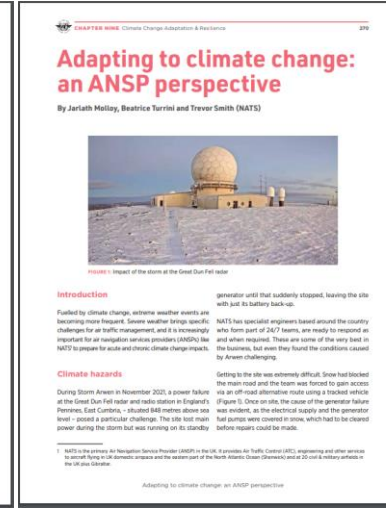
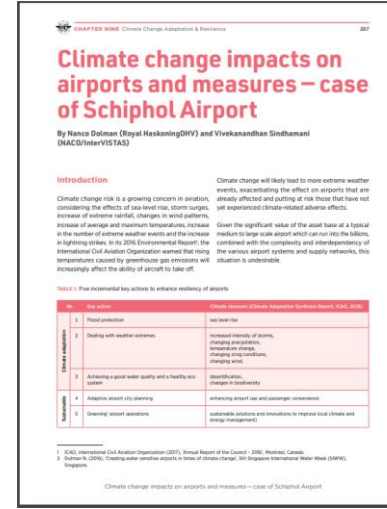
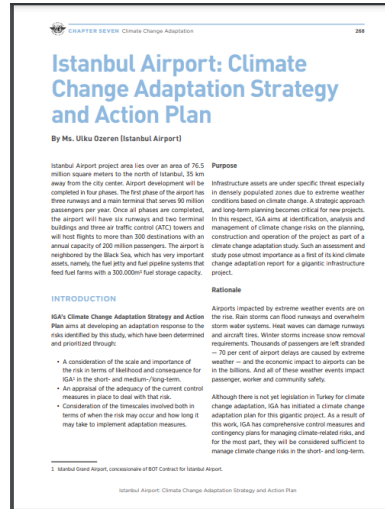
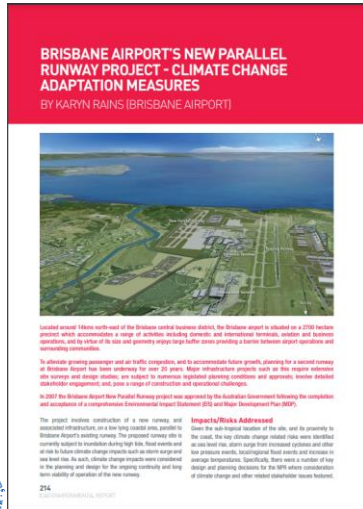
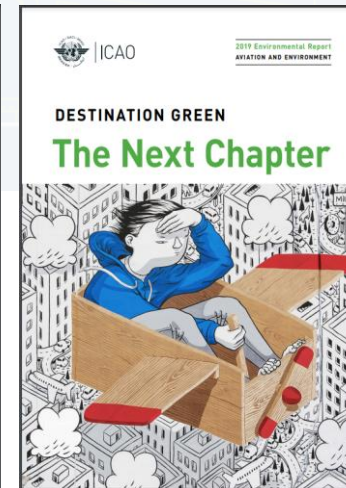
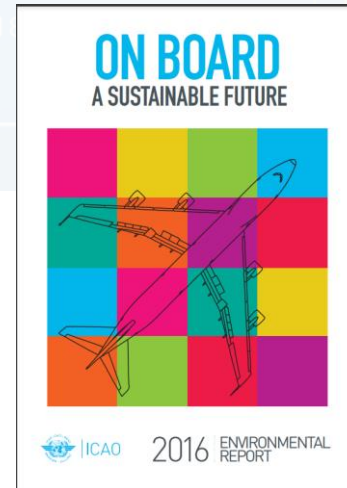
- Industry Recommendations;
- Resilience Planning;
- Reporting and Communications;
- Stakeholder Engagement;
- Combining Mitigation with Adaptation; and
- Some Available Resources Examples of Action



ICAO Environmental Reports (2016, 2019, 2022)

- Dedicated chapter on Climate Change Adaptation & Resilience

- ICAO Work on climate adaptation
- Articles, good practices, lessons learned from aviation stakeholders



ICAO Guidance on Climate Risk Assessment, Adaptation and Resilience (2022)

In response to A40-18 (2019):

- ICAO Guidance on Climate Risk Assessment, Adaptation and Resilience developed by CAEP
- Three interconnected but standalone documents
- Guidance material on risk assessment and adaptation and resilience planning:
 - Includes step-by-step process to carry out a climate change risk assessment and develop and implement a climate change adaptation plan
 - Includes key climate change vulnerabilities for aviation organizations, and
 - Provides menu of adaptation options
- Free of charge on ICAO web-site



Observed Impacts, Effects and Menu of Adaptation Options

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Examples of climate impacts and effects on airports:

CLIMATE IMPACT	RISK CATEGORY	POTENTIAL EFFECT	MENU OF ADAPTATION OPTIONS
Higher Average and Extreme Temperatures	Operations	Runway length: Limits to operations due to reduced climb performance Increased risk of fire	<ul style="list-style-type: none"> - Extend runway length - Cooling runways with recycled water - Pavement design for higher temperatures – design and re-design, maintenance as needed
Increased Intensity of Storms	Business and economics	Revenue losses and/or increased costs linked to: Flight delays, schedule changes, cancellations, and to operations interruptions and others	<ul style="list-style-type: none"> - Early warning systems and emergency management plan - Improved weather data availability and quality for flight planning and during flight execution ^{SIDS}
Sea Level Rise	Operations	Temporary closures of coastal and river airports during recovery from a high tide or storm surge event	<ul style="list-style-type: none"> - Allow a safe degree of inundation ^{SIDS} - Upgrade drainage capacity
Changing Precipitation	Infrastructure	Flooding due to insufficient capacity of storm drainage systems , Disruption to ground transport links	<ul style="list-style-type: none"> - Rainwater catchment systems to adapt to potential water scarcity - Ensure drainage networks are clear, functioning and with sufficient capacity for expected impacts ^{SIDS}

The table adapted from ICAO Guidance on Climate Risk Assessment, Adaptation and Resilience

ICAO SEMINAR ON Ongoing CAEP work on Adaptation (2023-2025)

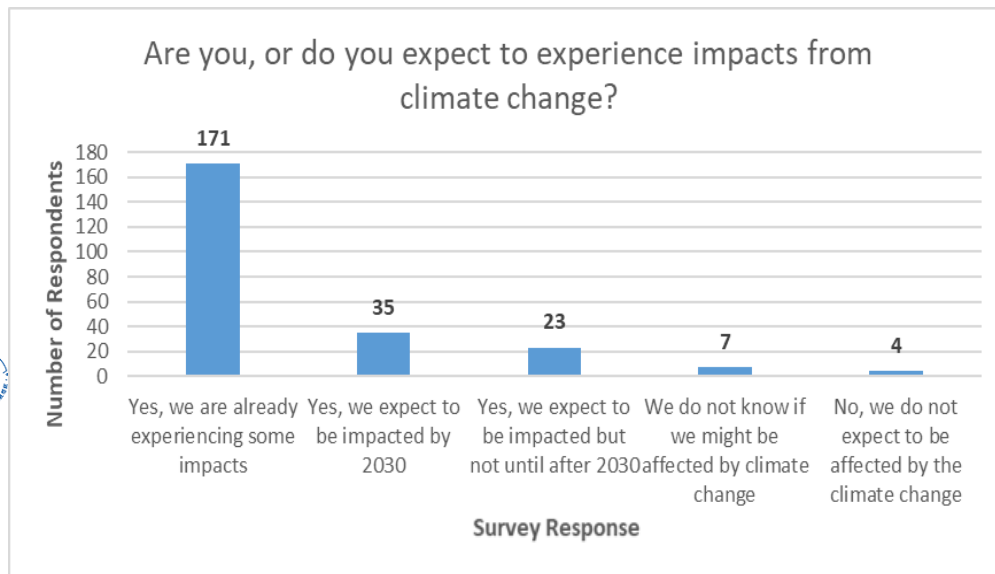
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In response to A41-21 (2022):

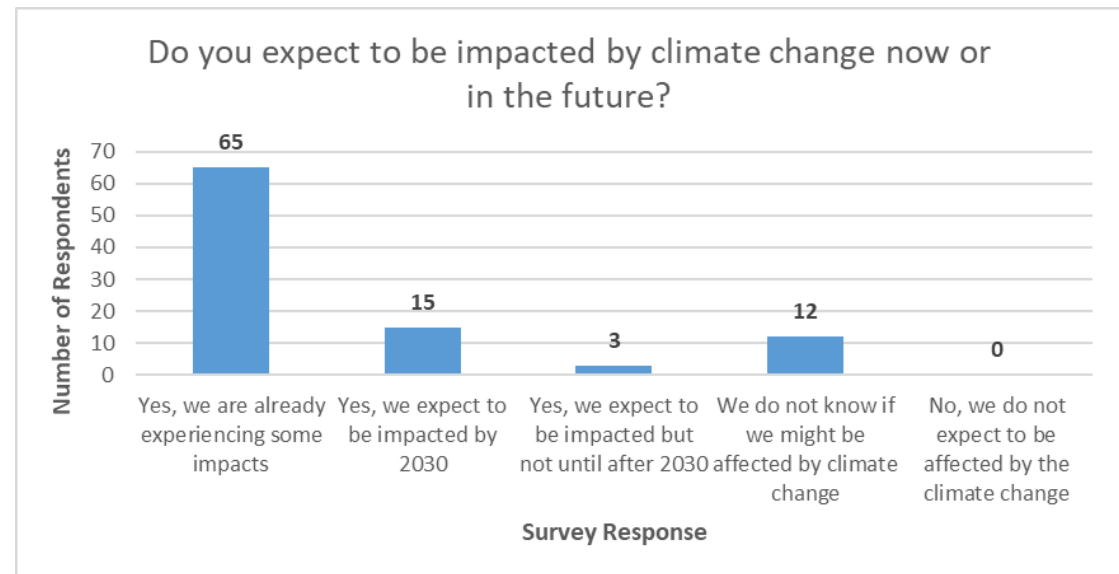
- CAEP WG2 on Airport and Operations
 - Updating the Climate Adaptation Synthesis Report (2018) including re-running the Stakeholder survey
- Preliminary Results Preview
 - Over 250 responses to online survey



2023

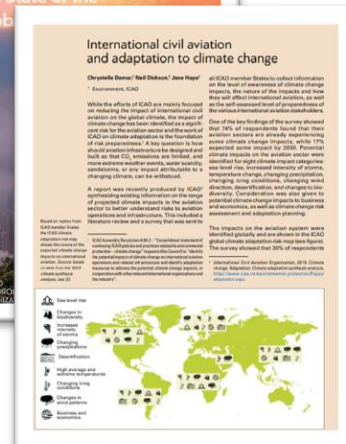
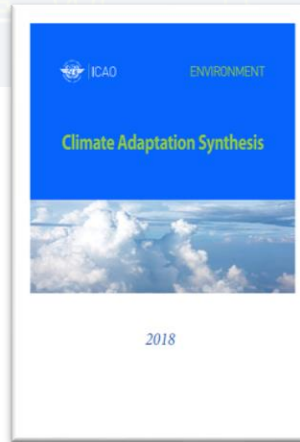


2018



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Thank You

