

Update of Ozone and Climate Protection Activities



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IASFPWG Meeting

November 19-20, 2008

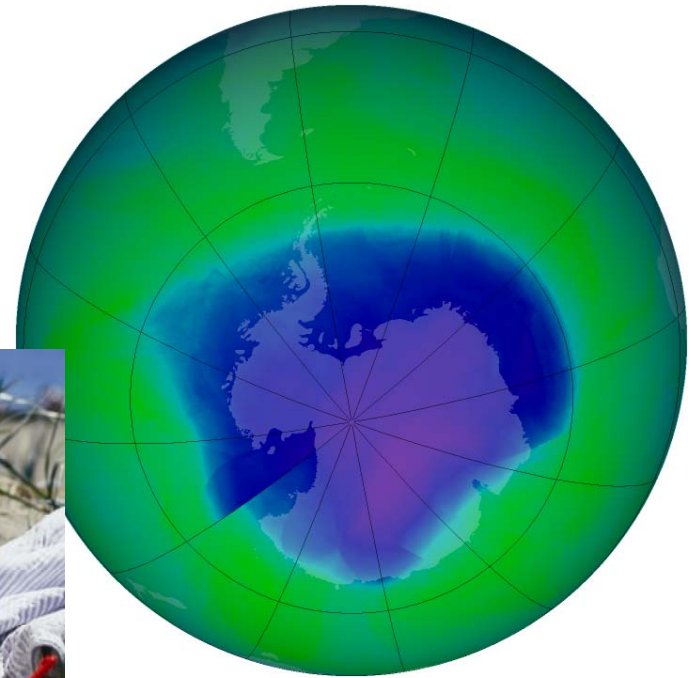
Atlantic City, NJ

Outline

- **Why is recovery of the ozone layer important?**
- **What has the Montreal Protocol accomplished?**
- **What has the US accomplished?**
- **Why are the US and Protocol accomplishments important to climate protection?**
- **What are the challenges for environmental protection for the aviation sector?**

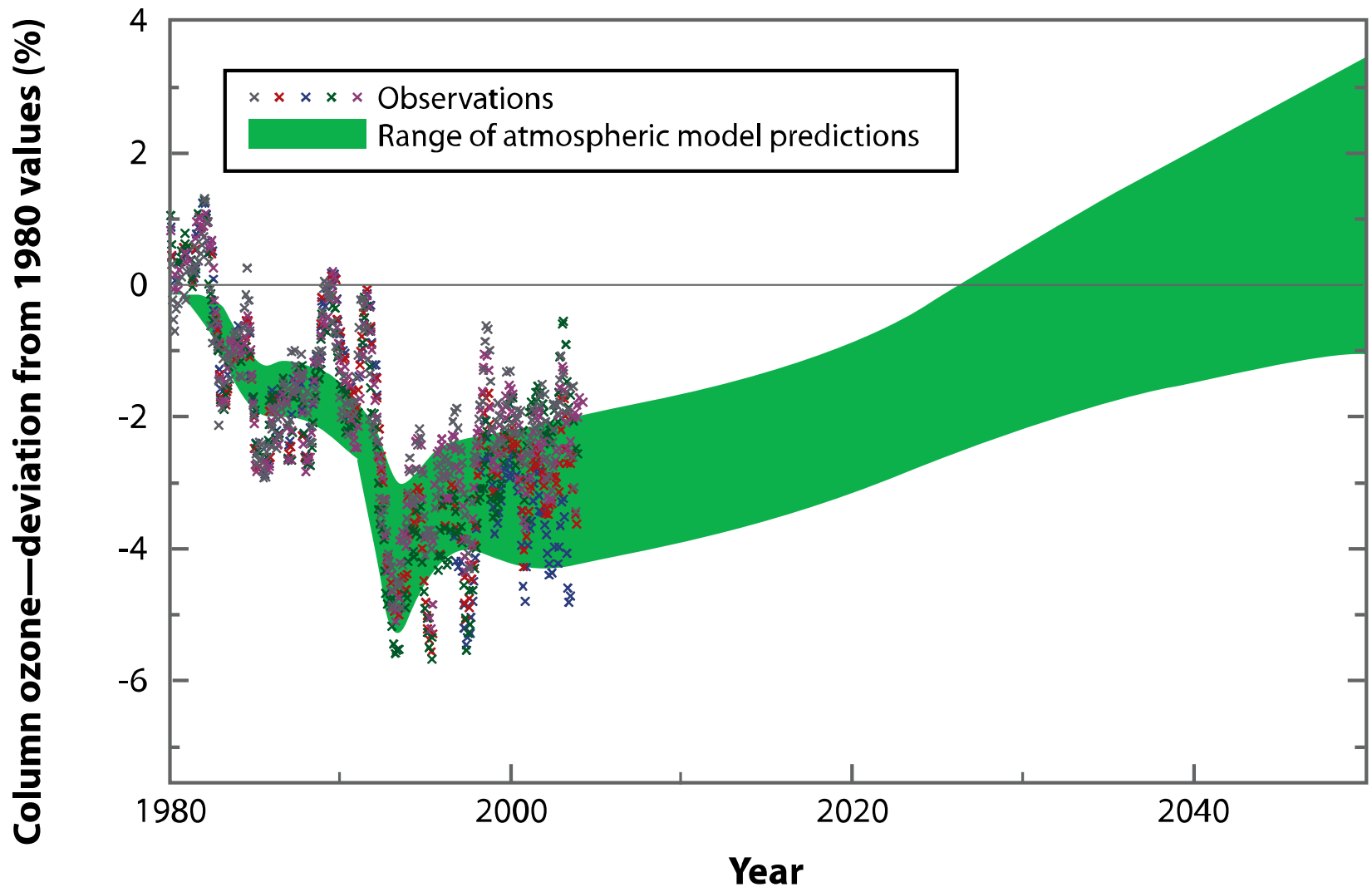
Why is recovery of the ozone layer important?

- Critical shield from overexposure to UVB
- Skin damage
- Eye damage (cataracts)
- Suppressed immune system
- Crop damage
- Stress on marine ecosystems



Nov 15 2008 (NOAA)

Global Ozone Depletion and Recovery



What has the Montreal Protocol accomplished?

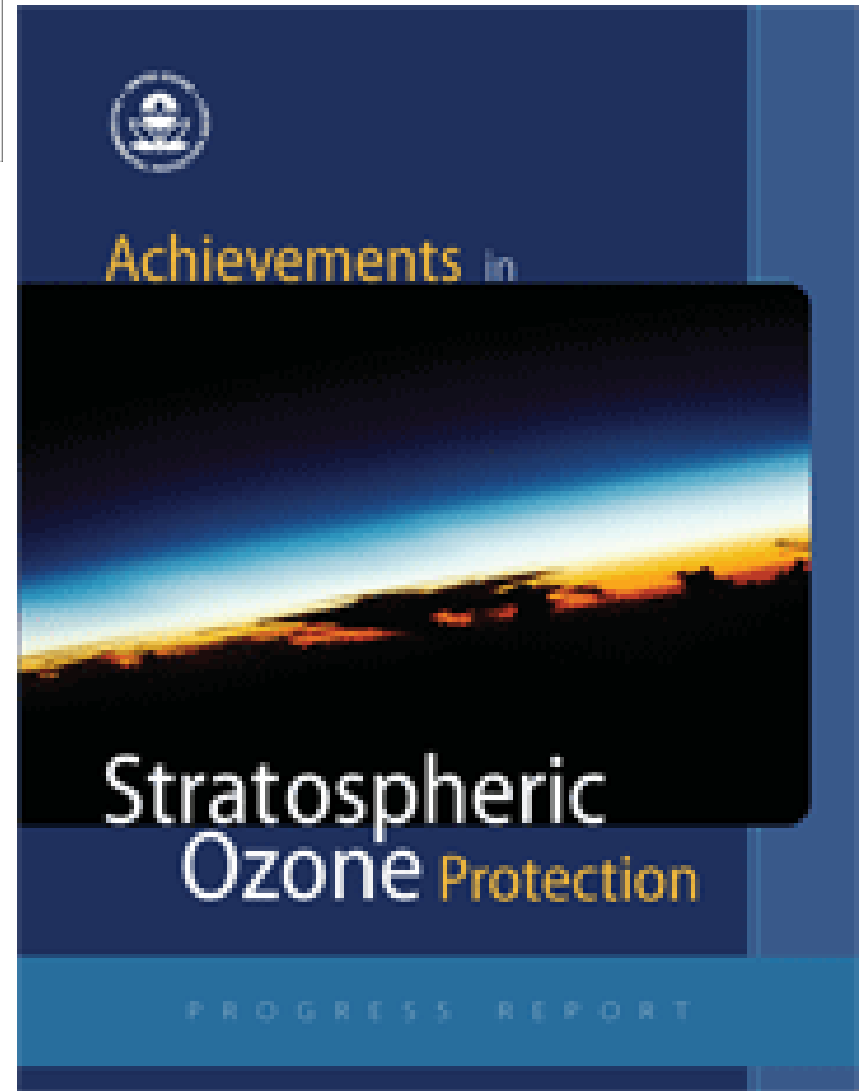
- 1987: 27 countries signed treaty
- 2008: 191 countries are reducing emissions to the ozone layer
- The ozone layer is on track to heal (over many years)
- Protocol is an important framework for addressing a global environmental problem:
 - Measurable goals/actions for achieving success
 - Sound scientific basis, technical expertise
 - Support for developing country transition
- Healing the ozone layer provides important climate co-benefits

2007 Milestone Year for Protocol

- 20th Anniversary year
 - Celebration of success in Montreal
 - Opportunity for improvement
- 19th Meeting of Parties accelerated Class II, HCFC phasedown
 - Global benefits: 47% cut in HCFC production/consumption
 - For ozone layer: About 1 million ODP tons averted
 - For climate: 3,000 – 16,000 MMTCO₂eq averted
(Equivalent to 50% of U.S. cars over 30 years)
- UNEP Ozone Awards
- US EPA Best-of-the-Best Stratospheric Ozone Protection Awards

What has the US accomplished?

- US has been a global leader
 - To restore ozone layer, prevent harmful effects of ultraviolet radiation overexposure
 - CAA regulations balanced by market flexibility
 - Class I phaseout (CFCs, halons) essentially completed
 - Accelerated Class II (HCFC) phaseout underway
 - Support for sector transitions
- Outstanding environmental and health benefits
 - Benefit-cost ratio of 20:1
 - *6.3 million U.S. skin cancer deaths prevented by 2165*
 - *\$4.2 trillion in societal health benefits (1990-2165)*



EPA-430-R-07-001 (April 2007)

Why are the US and Protocol accomplishments important to climate protection?

- ODS are significant greenhouse gases
 - Have contributed approx. 20% of the radiative forcing of CO₂
- By 2010, ozone layer protection will have done *more to mitigate climate change* than initial Kyoto Protocol reduction target
 - Avoided 11 gigatons of CO₂ equivalent per year
 - Delayed climate impacts by approximately 10 years

Source: PNAS 2007



For ozone layer recovery and climate protection...

- Countries must fully comply with their commitments to the Protocol, including required reductions in production of all ODS
- Find solutions to remaining, continued reliance on ODS in some sectors that doesn't erode progress and benefits achieved
- Support or accelerate the transition to substitutes
- Manage remaining banks:
 - Reduce emissions from ODS remaining in use
 - Eliminate emissions altogether through destruction
- Support initiatives to realize climate co-benefits (carbon credits for Class I ODS destruction)

US Halon Activities

- 1994 – ban on production and import; SNAP
- 1998 – ban on halon blends, intentional venting; technician training, proper disposal; imports
- 2000 – US Halon Management Strategy
 - State Dept. to Ozone Secretariat
 - Strong policy, reg, and admin. structures
 - Market movement from non-critical to critical uses while minimizing emissions
- Support for sector transition:
 - Standards and codes: NFPA, ISO
 - Critical users: IMO, DOD, FAA/ICAO
 - Domestic: HARC/HRC, Voluntary Industry Code of Practice
 - International: UNEP Halon Technical Options Committee (HTOC)
- Emerging issues: bank management, imports and carbon credits for destruction

2006 UNEP HTOC Assessment

Report: Halon Inventory

- Halon production for fire protection
 - Only in China and S. Korea
 - China stopped halon 1211 production in 2005; halon 1301 production below allowed
- 2005 global inventories:
 - Halon 1301: 50,000 MT
 - Halon 1211: 90,000 MT
- Adequate global stocks of halons 1211/1301 currently exist to meet needs of existing critical use fire equipment until end of useful lives
- Uncertainty in future market availability

2006 UNEP HTOC Assessment

Report: Civil Aviation

- Alternative methods used on ground-based situations
- Existing civil aircraft and new designs continue to depend on halons
- Given 25–30 year lifespan of civil aircraft, this dependency likely to continue well beyond the time when existing recycled halon stocks expire.
- Sector must look to own stockpiles or to recycled halons in uncertain market



ICAO Resolution A36-12

1. *Agrees* with the urgency of the need to develop and implement halon replacements for civil aviation;
2. *Urges* States to advise their aircraft manufacturers, airlines, chemical suppliers and fire-extinguishing companies to move forward at a faster rate in implementing halon alternatives in engine and auxiliary power units, handheld extinguishers and lavatories; and investigating additional halon replacements for engines/auxiliary power units, and cargo compartments;
3. *Requests* that the Council consider a mandate to be effective in the 2011 timeframe for the replacement of halon in:
 - lavatories for new production aircraft; and
 - lavatories, hand-held extinguishers, engines and auxiliary power units for aircraft for which a new application for type certification has been submitted.



ICAO Resolution A36-12

4. *Requests* that the Council consider a mandate to be effective in the 2014 timeframe for the replacement of halon in hand-held extinguishers for new production aircraft;
5. *Encourages* ICAO to continue collaboration with the International Aircraft Systems Fire Protection Working Group and the United Nations Environment Programme's (UNEP) Ozone Secretariat through its Technology and Economic Assessment Panel's Halons Technical Options Committee on the topic of halon replacement for civil aviation, and
6. *Resolves* that the Council shall report to the next Ordinary Session of the Assembly on progress made with halon replacements in civil aviation.



ICAO State Letter on Halons

- On March 28, 2008, ICAO issued a letter to all member States
 - noting the adoption of Assembly Resolution A36-12 on halon replacement
 - urging them to advise their aircraft manufacturers, airlines, chemical suppliers and fire-extinguishing companies to move forward at a faster rate in implementing halon alternatives
- On May 19, 2008, “Civil Aviation Halon Transition Team” received EPA’s 2008 Stratospheric Ozone Protection Award
 - UNEP Ozone Secretariat and ICAO
 - UNEP HTOC
 - DOT
 - FAA: Aviation Safety, FAA Technical Center, Office of International Aviation



Challenges to Ozone and Climate Protection for Aviation

- “Sky’s the limit” for environmental challenges
- 15 years since halon production ended in the US
- Honest assessment of transition efforts, benefits-costs, outcomes
 - No breakthrough halon substitute
 - Accountability, return on investment, point of diminishing returns
- Past performance indicator of future performance
 - ICAO resolution
 - Response to UL deadline
 - Response to global environmental challenge of ozone depletion
- What is aviation’s Plan B?
 - Halon Management vs. Halon Phaseout Strategy for Aviation?
 - How will airframe manufacturers secure halons for new aircraft?
 - How will airlines secure halons to service existing fleet and new aircraft?

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