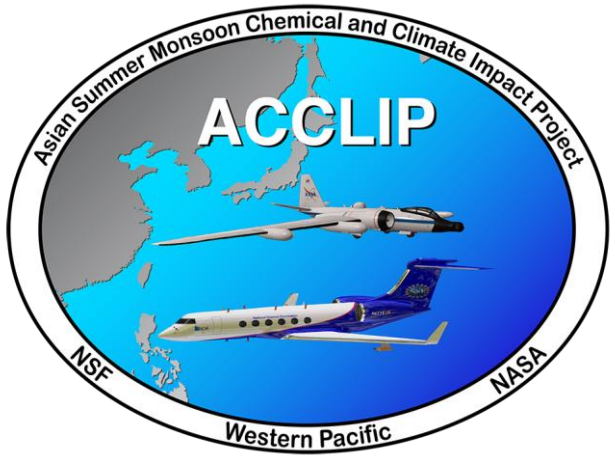
The Asian Summer Monsoon Chemical & Climate Impact Project

Principal Investigators: Laura Pan (NCAR/ACOM), Paul Newman (NASA/GSFC)
Lead Co-Investigators: Elliot Atlas (Univ. Miami), William Randel (NCAR/ACOM), Troy Thornberry (NOAA/CSL), Brian Toon (CU Boulder)



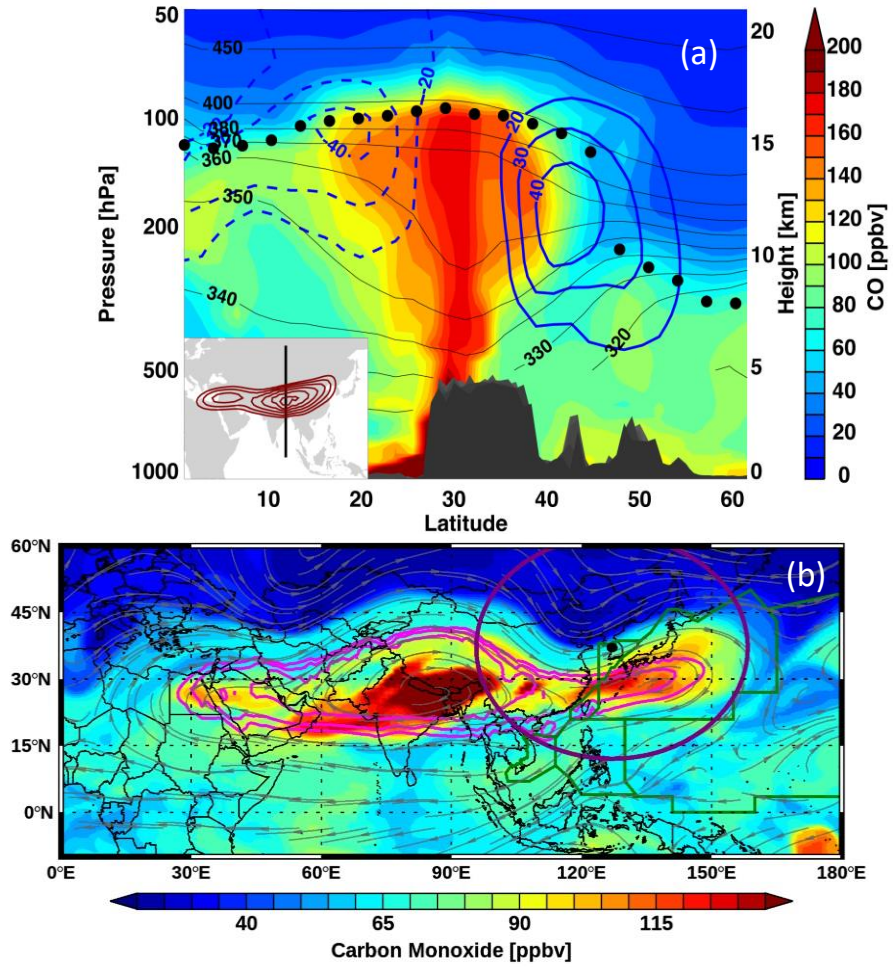
- **ACCLIP** is an airborne field campaign, jointly sponsored by NSF and NASA
- The campaign is scheduled to take place in July – August 2022, operating from Osan AFB, Republic of Korea
- For more information, see our website under the NCAR Atmospheric Chemistry Observations & Modeling Lab: https://www2.acom.ucar.edu/acclip

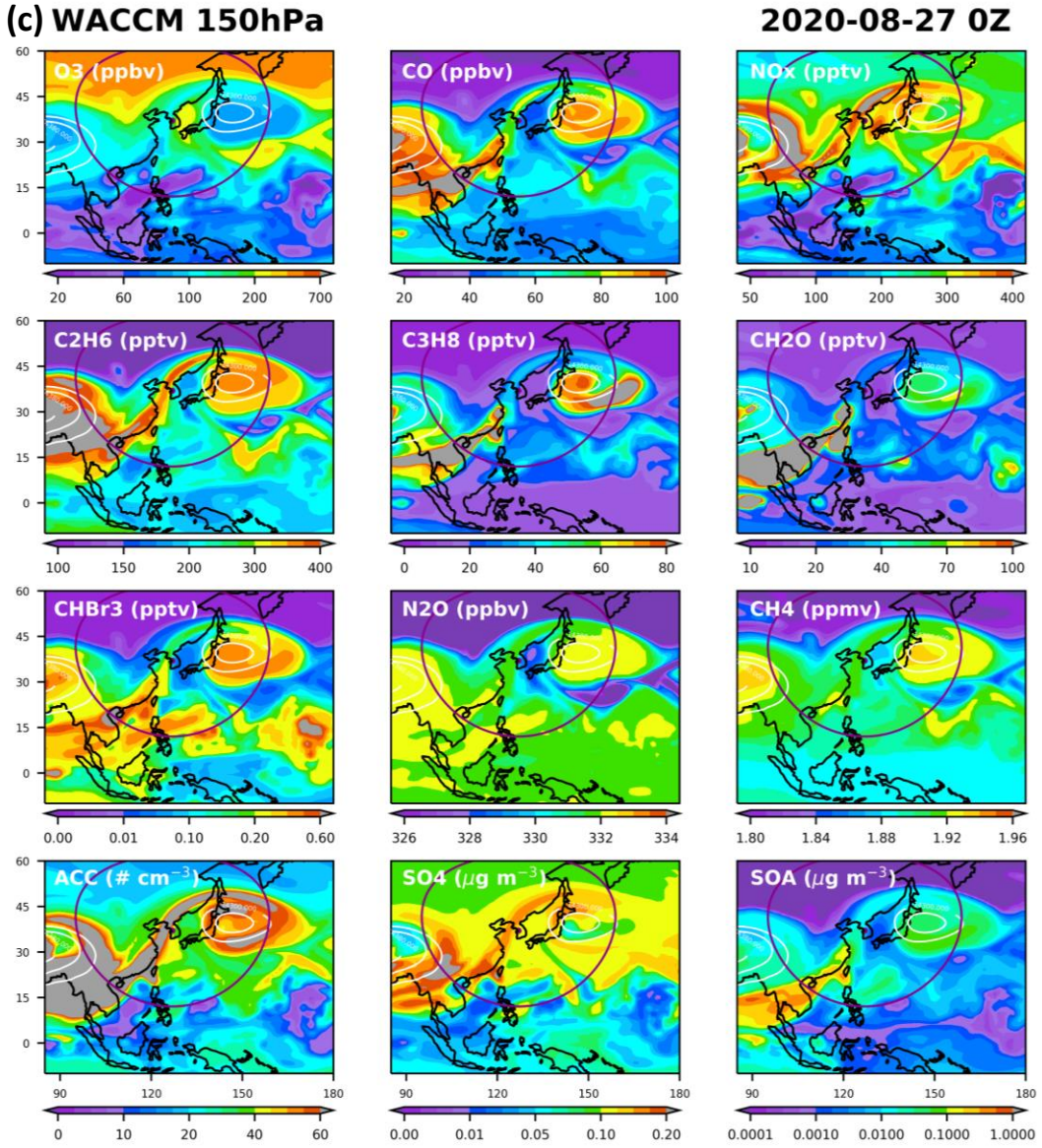
ACCLIP Science Background

Primary Goal: **To investigate the impacts of Asian gas and aerosol emissions on global chemistry and climate via the linkage of Asian Summer Monsoon (ASM) convection and associated large-scale dynamics**

- Asian Summer Monsoon convection creates a large anticyclone at the upper troposphere and lower stratosphere (UTLS), which contains air masses of distinct chemical and aerosol content.
- Satellites and model studies show that the monsoon convection is a significant transport process connecting the polluted Asian boundary layer to the UTLS. The lifted surface air contains various chemical compounds and particles (aerosols) from populations, industry, agriculture, biological processes, and other activities
- The questions are: what are the active chemical content in this layer, such as short-lived chlorine and bromine species relevant to ozone chemistry? What's the detailed content of the aerosol layer and its climate effect?
- In situ measurement is the only way to obtain this information. The ACCLIP campaign with two research aircraft, NCAR Gulfstream V (GV) and NASA WB-57, is expected to yield significant information for chemistry-climate model studies of this large-scale system.

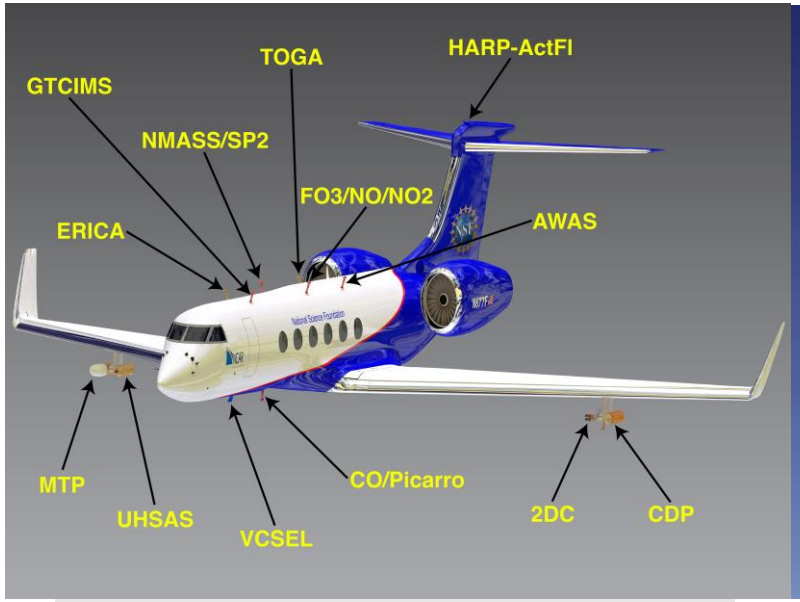
ACCLIP Science Background



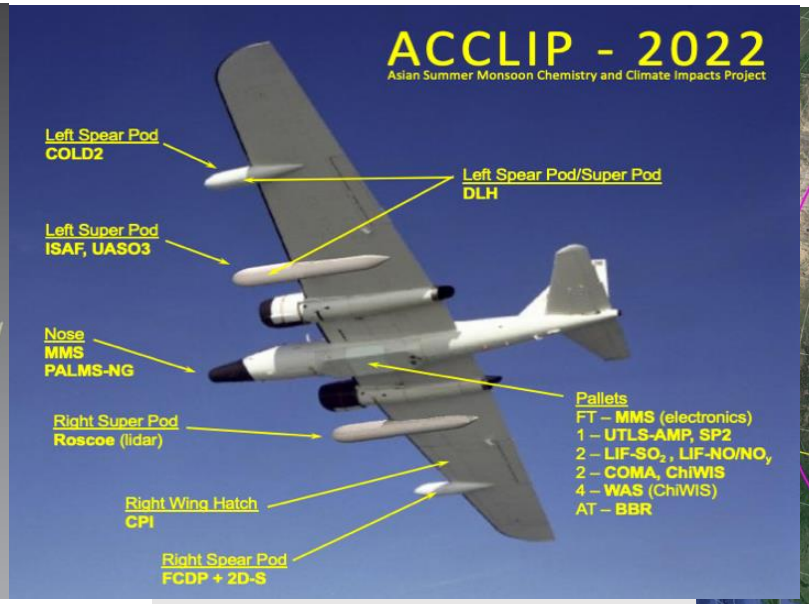


NCAR WACCM model result showing how (a) pollutants (represented here by carbon monoxide) are lofted by deep monsoon convection to 15-17 km altitude; (b) then periodically horizontally shed out into the Western Pacific region at upper levels throughout the monsoon season; and (c) the enhanced natural and anthropogenic gases and aerosols contained within such shedding air masses

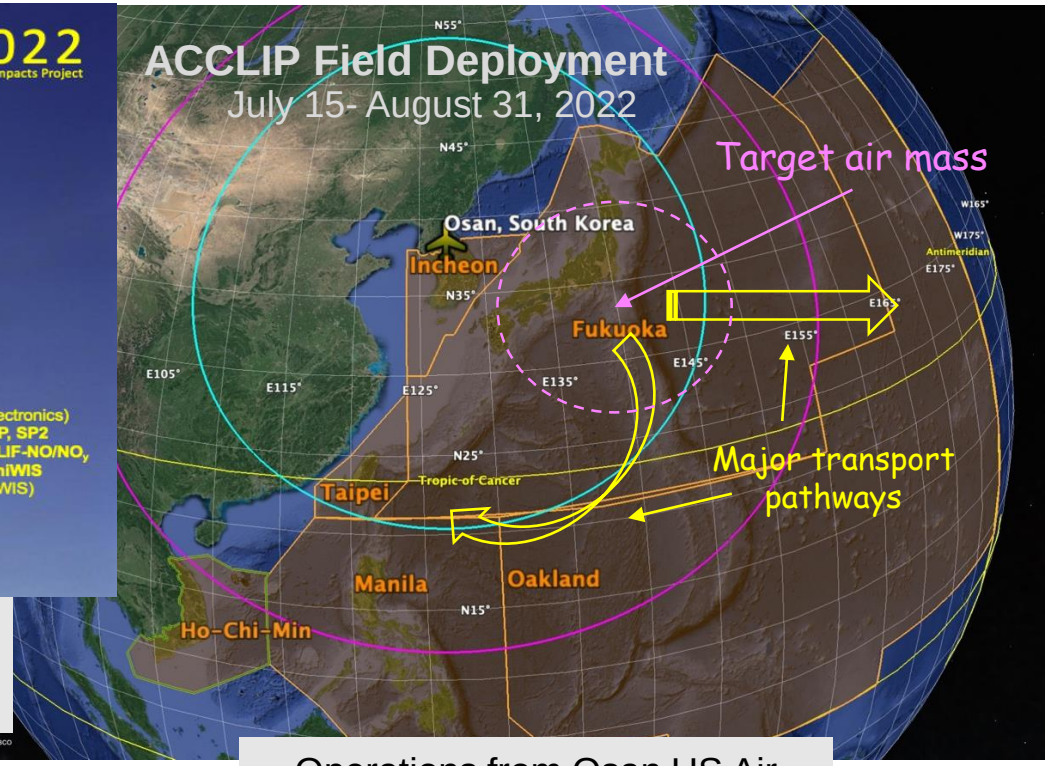
The Asian summer monsoon Chemical and Climate Impact Project (ACCLIP):



NSF/NCAR Gulfstream V (GV)
Duration: ~ 8 hr flight
Altitude range: ~ 0.3 - 14.7 km



NASA WB-57
Duration: ~ 6 hr flight
Altitude range: ~ 13 - 19 km



Operations from Osan US Air Force Base, Republic of Korea

The two research aircraft are equipped with full chemistry and aerosol payload!

For ACCLIP GV and WB-57 data product information:
https://www2.acom.ucar.edu/acclip/gv-payload
https://www2.acom.ucar.edu/acclip/wb-57-payload