

27 October 2023

SAP Side Event on 26 October 2023

Presentation by David Fahey, Scientific Assessment Panel (SAP) Co-Chair: Climate Intervention and Stratospheric Ozone: Introduction and results from the 2022 UNEP/WMO Scientific Assessment of Ozone Depletion

Summary

Climate intervention refers to cooling the Earth by human means to offset the warming and other impacts due to greenhouse gas accumulation. Should it ever become important for society to cool Earth rapidly, climate intervention by solar radiation modification (SRM) methods is the only way that has been suggested by which humans could potentially cool Earth within years after deployment. Projections of continuing emissions of greenhouse gases and growing impacts from climate change are increasing global interest in climate intervention. The leading SRM method is stratospheric aerosol injection (SAI), which would inject aerosol or aerosol precursors into the stratosphere. Observations following explosive volcanic eruptions along with model simulations confirm that increasing stratospheric sulfate aerosols can substantially cool the planet. SAI is expected to change stratospheric ozone chemistry and stratospheric heating which potentially alters the global ozone distribution. In response to the potential importance of SAI to the future ozone layer, the parties to the Montreal Protocol have made an initial assessment of the potential effects on the stratospheric ozone layer in its 2022 assessment cycle. This presentation introduced the concept of climate intervention, described SAI scenarios and response mechanisms, discussed the expected changes in stratospheric ozone from SAI based on global model results, and described recent research results based on stratospheric observations.

Questions/comments after the presentation included clarifying if SAI was not currently being conducted in the world; noting that the peakshaving scenario assumes aggressive mitigation (eg. CDR) of which the availability at scale is highly uncertain; noting that the space activity is likely to increase substantially in projections for coming decades leading to increased space debris in stratospheric particles; and noting the anticipated importance and complexity of the governance of SAI.