Preliminary discussion of the new report on increased emissions of CFC-11

Scientific Assessment Panel

Bonfils Safari, John Pyle,

David Fahey, Paul A. Newman

& Steve Montzka

The issue

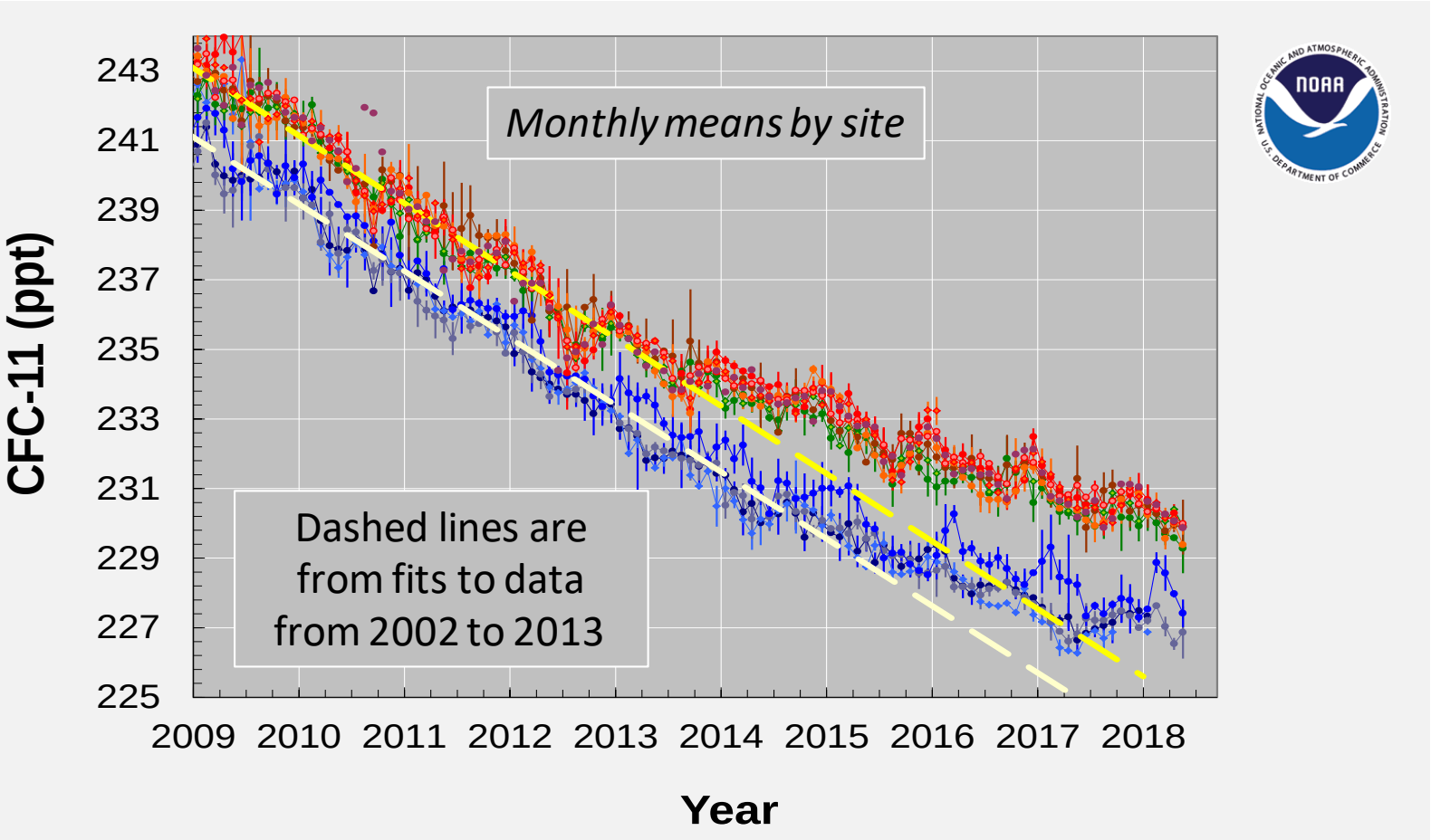
The evidence for increasing emissions of CFC-11

S.A. Montzka, G. Dutton, P. Yu, E. Ray, R. Portmann, J. Daniel, L. Kuijpers, B.D. Hall, D Mondeel, C. Siso, J. D. Nance, M Rigby, A.J. Manning, L. Hu, F. Moore, B.R. Miller, and J.W. Elkins.

Nature, *557*, 413-417, 2018.

https://doi.org/10.1038/s41586-018-0106-2

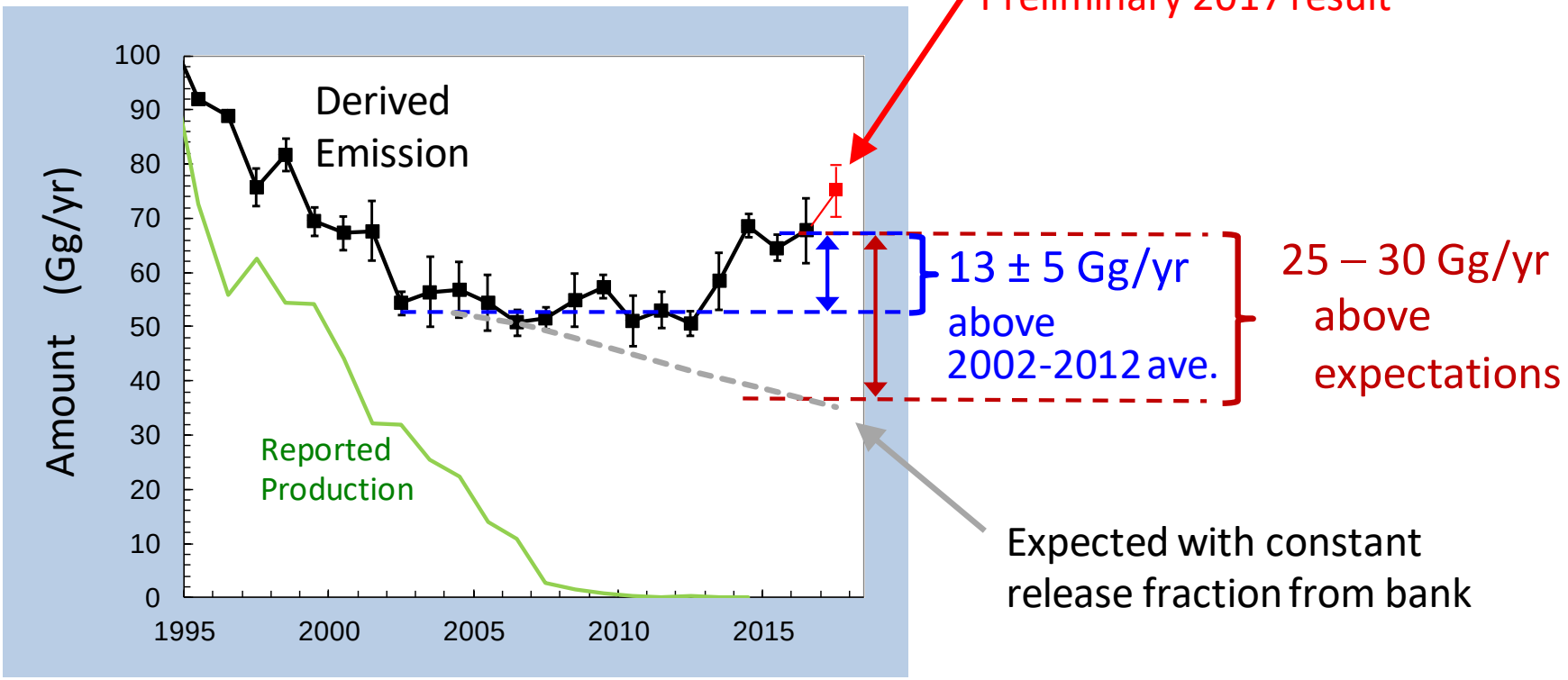
Measured CFC-11 concentrations at multiple sites around the world



→ The decline in atmospheric CFC-11 has been unexpectedly slow recently (or since 2013)

Montzka et al. (2018)

Global emissions are easily derived from atmospheric concentration data



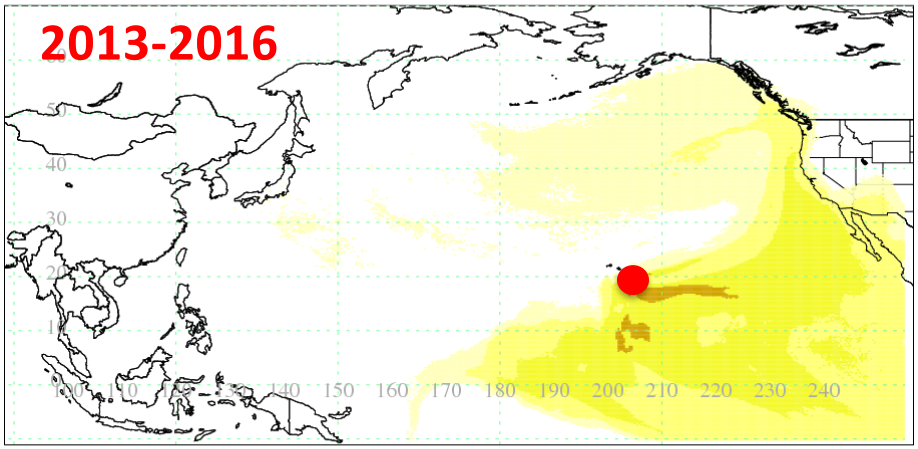
→ CFC-11 emissions have increased since 2012

Montzka et al. (2018)

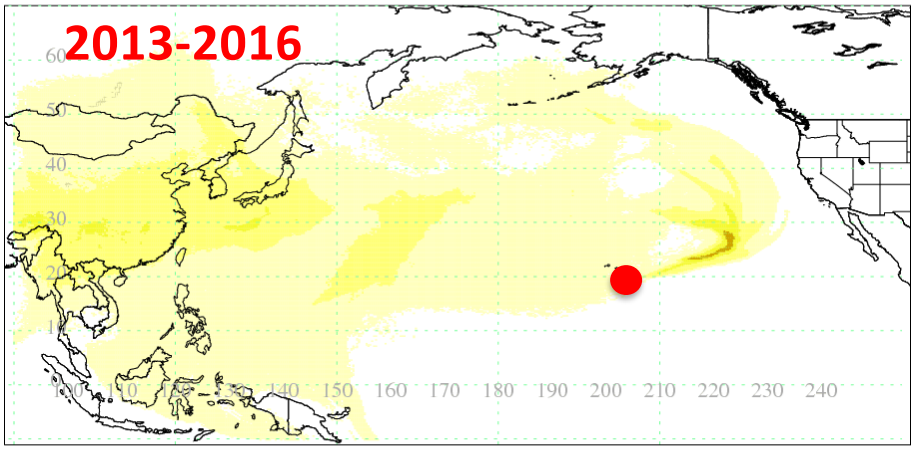
Surface regions influencing measurements at Hawaii

→ Backward tracing of air using meteorological data

Lower [HCFC-22] & [CFC-11]



Higher [HCFC-22] & [CFC-11]



→ Elevated CFC-11 concentrations observed at Hawaii since 2013 are tied to surface emissions from eastern Asia

→ Other evidence indicates that emissions from eastern Asia have increased since 2013

Montzka et al. (2018)

Montzka et al. Summary Points

1. Since 2013, the annual decline in CFC-11 concentration ***has been only half as fast*** as it was over the previous decade (2002-2012). → *a very robust result*
2. Emissions of CFC-11 ***increased after 2012*** and have remained elevated in all years since. → *2017 emission is also high*
3. ***Emissions of CFC-11 from eastern Asia have increased*** since 2012. → *exact country not identified by these data*
4. The ***observations suggest unreported production of CFC-11*** after the 2010 global phase-out. → *but we don't have proof*

- Detecting and diagnosing atmospheric composition change depends on a global network of high quality measurements, and analysis tools.

CFC-11 response

- The results from Montzka et al. are included in the "Scientific Assessment of Ozone Depletion: 2018"
  - The Source Gas Chapter 1 affirms the Montzka et al. results, with consideration of additional observational evidence
  - The Scenarios and Information for Policymakers Chapter 6 shows the implications of these emissions → sustained CFC-11 emissions delay ozone layer recovery
- The Executive Summary (ES) will be written by scientists next week; it will include the assessed understanding of CFC-11 by the international science community
  - This ES will be available to the Parties in the Fall prior to the MOP,
  - SAP co-chairs will present the main findings at the MOP.
  - The complete assessment will be published by 31 Dec. 2018.
- More work has been set into motion by the Montzka et al. paper → this will take time, and we estimate that new papers should become available sometime in 2019