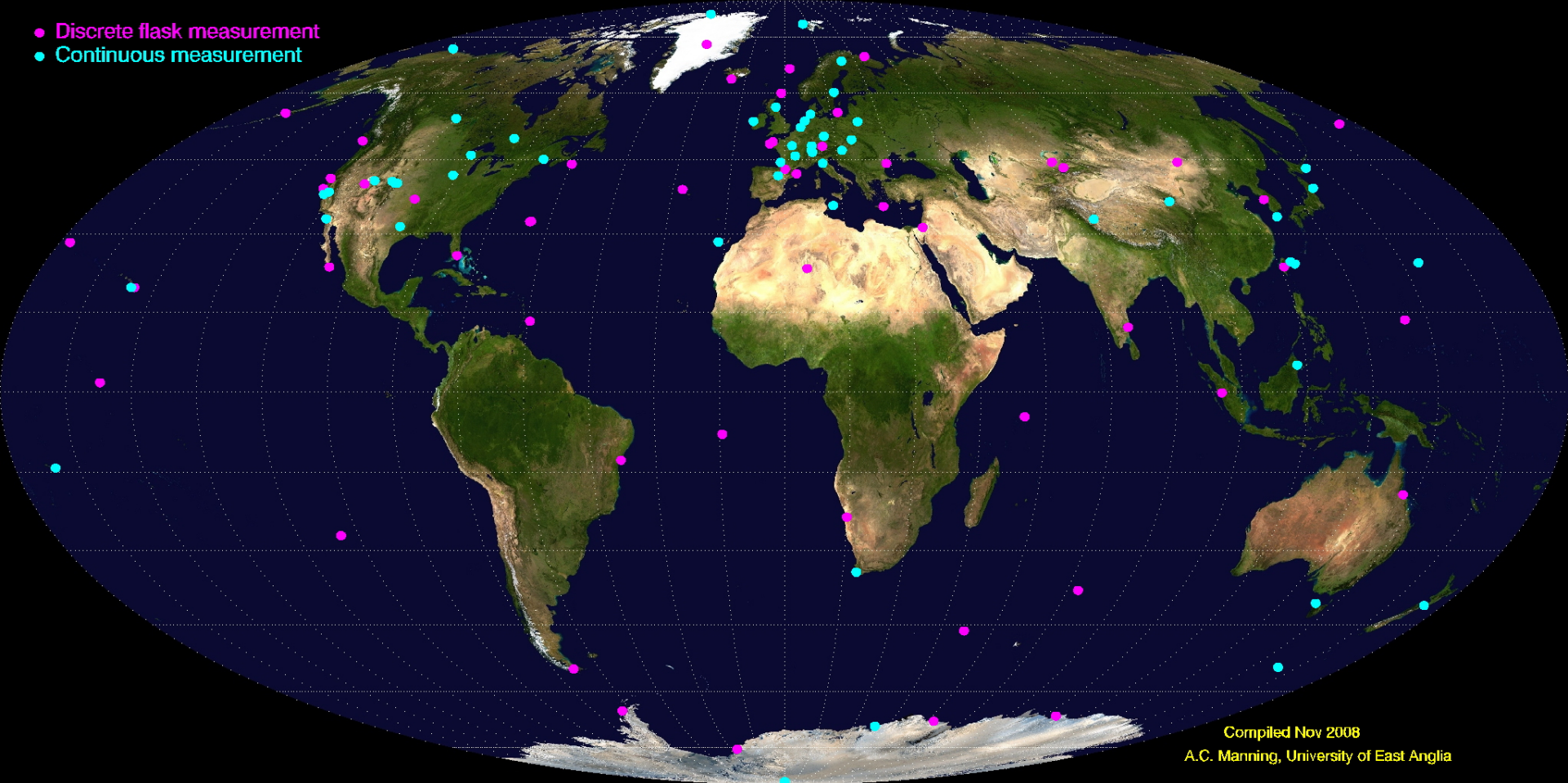


Greenhouse Gases in the Earth System: setting the agenda to 2030

- Discrete flask measurement
- Continuous measurement



The *in situ* monitoring network (reporting to precision suitable for modelling)

NOAA, France, Australia, NZ, China, Japan, South Africa, Finland, Norway, Spain, Hungary, Poland, Switzerland, India, Netherlands, Ireland, Brazil, Canada, etc etc.

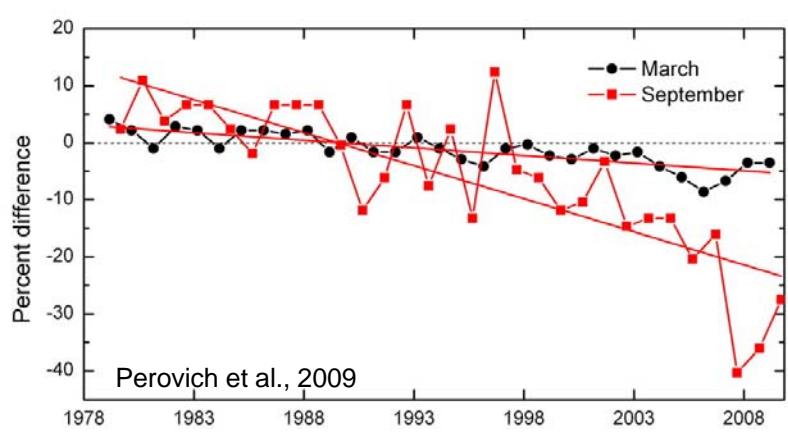


Dave Simond

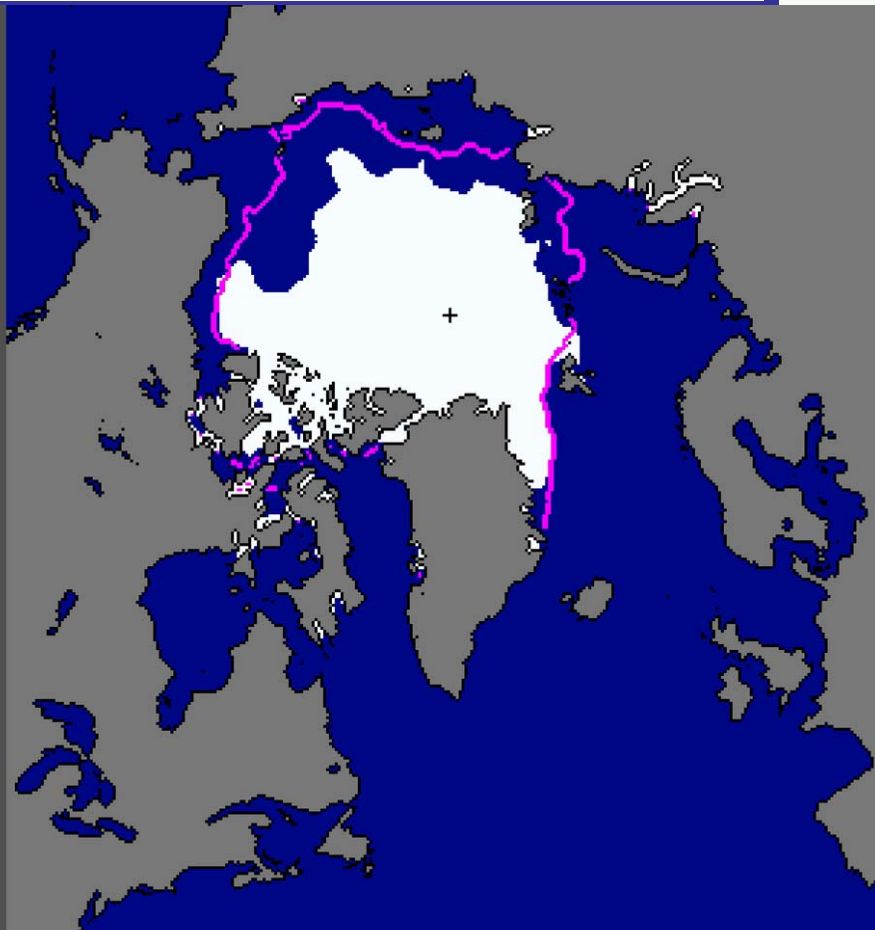
Verification of Emissions

“Trust, but verify” - Ronald Reagan

1. Emissions are currently self-declared at all levels.
2. The Nuclear Test Ban Treaty succeeded because it was verified by the worldwide network of seismographs. That also gave us Plate Tectonics.
3. There is a need for a similar independent verification mechanism for greenhouse agreements, and for carbon trading.
4. Such a system should include networks of *in situ* ground-based stations, aircraft sampling, and satellite cover. An *in situ* network would not be very costly - comparable to the seismograph network.



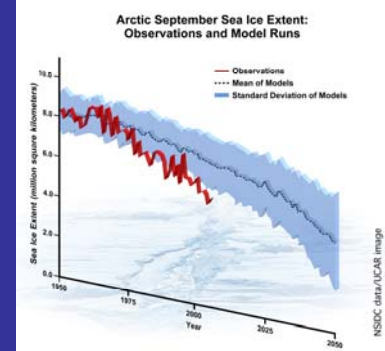
Sir Edwin H. Landseer, RA: *Man Proposes - God Disposes*



Sept. 2009

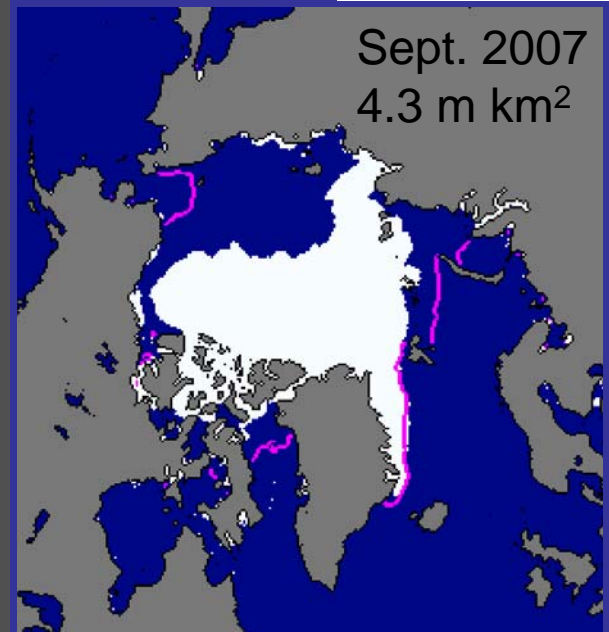
Total extent = 5.4 million sq km

The warming Arctic



NSIDC
maps and
graphs

median
ice edge



Sept. 2007
4.3 m km²