CLIMATE CHANGE AND METHANE: WHAT WE KNOW

AMANDA STAUDT, Ph.D., Director
Board on Atmospheric Sciences and Climate
Polar Research Board
National Research Council (NRC)
National Academy Of Sciences (NAS)
NAS has published dozens of reports on climate change since the 1970s.
We know that...

- Human activities are changing climate

Find it at: americasclimatechoices.org
We know...

- why CO$_2$ and other greenhouse gases cause warming
We know that...

- Greenhouse gases are increasing...
  - CO$_2$ increased by 40%
  - Methane increased by 150%

- and are higher now than anytime in last 800,000 years.
We know that...

- The planet has warmed 0.8°C (1.4°F) since 1900.
We know that...

- Ice and snow are decreasing.
We know that...

- Ocean heat and sea level are increasing.
We know that...

- More warming is expected as CO$_2$ and other greenhouse gases increase.
- Reductions in emissions can limit future warming.
We know that...

- a few degrees is cause for concern
  - Widespread changes in regional and local temperature and precipitation
  - Weather extremes: more frequent heavy rainfall and snowfall events and heat waves
  - Impacts on human societies and the natural world
How can we limit future warming?

- “The United States needs: prompt and sustained strategies to reduce greenhouse gas emissions” (NRC, 2010)
U.S. Greenhouse gas emissions, 2012

EPA estimates of U.S. greenhouse gas emissions 2012
Methane is a significant Short-Lived Climate Pollutant (SLCP)
Controls on CO$_2$ and SLCP affect different aspects of climate

- “The effect of mitigation of methane and black carbon is thus to trim the peak warming rather than limit the long-term warming to which Earth is subjected. If the early action to mitigate methane emissions was done instead of action that could have reduced net cumulative carbon emissions, the long-term CO$_2$ concentration would be increased as a consequence.” (NRC, 2011)
Temperature response to reductions in emissions of CO$_2$, SLCPs, or both.

SOURCE: Shoemaker et al., 2013.
Methane has many sources

- Energy (40.5%)
- Waste (20.7%)
- Agriculture (35.5%)
- Land use, land-use change, and forestry (2.7%)
- Industrial processes (0.7%)

EPA estimates of U.S. anthropogenic methane emissions 2012
THANK YOU!

For more information, visit americasclimatechoices.org.