

Impact of Climate change on fate and transportation of POPs in the Arctic



4th SaGHAA 2017

Presented By

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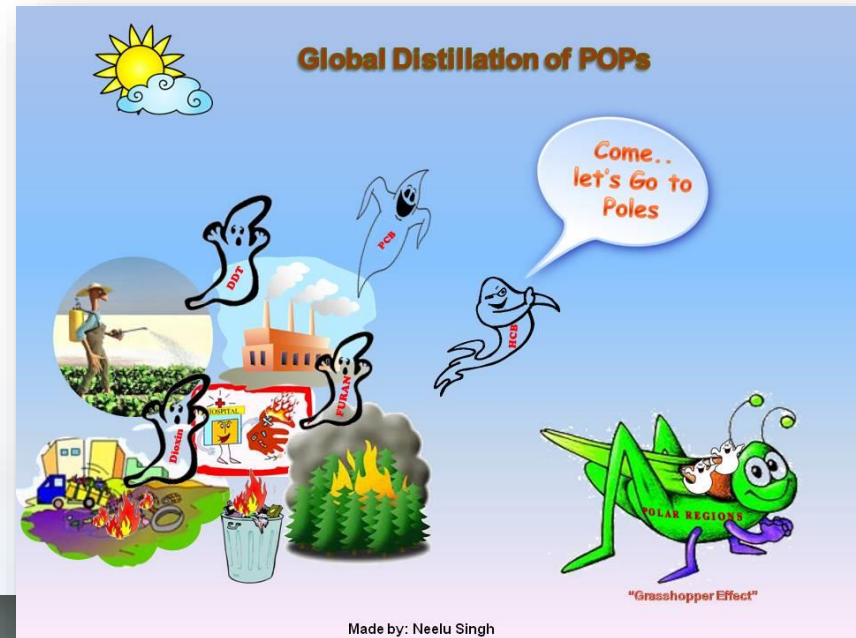
National Committee Coordinator

Association of Early Career Polar Researcher- (APECS)



Persistent Organic Pollutants : 'Global Pollutants'

- ★ Toxic
- ★ Persistent
- ★ Bioaccumulate
- ★ Long Range Transportation



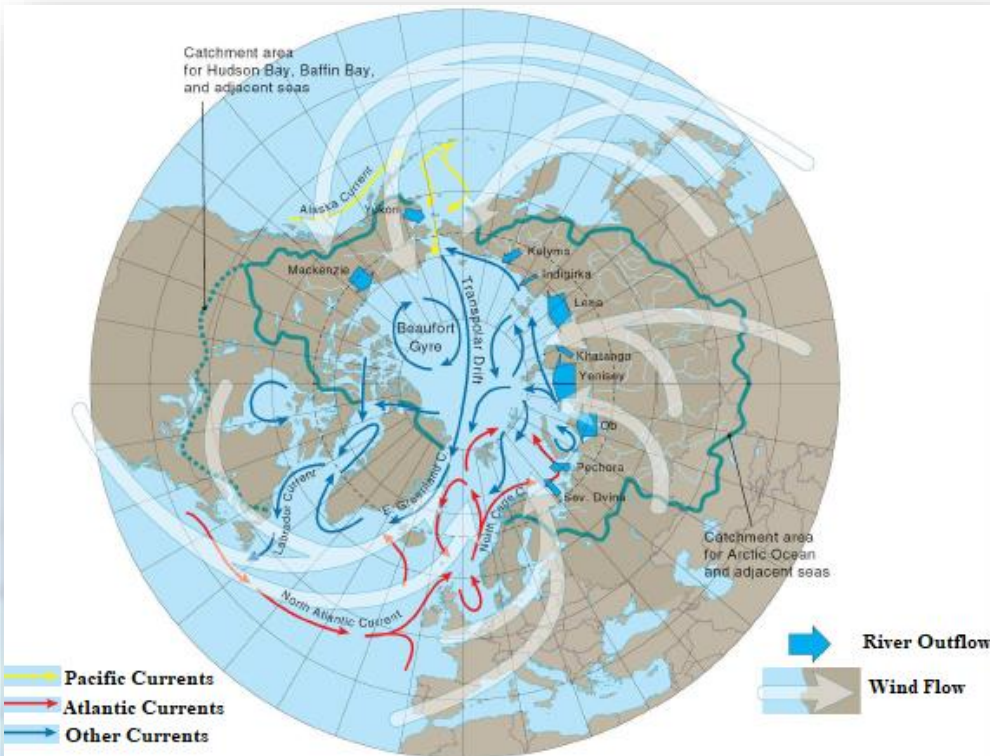
No Natural Sources

Anthropogenic Sources

How do they get to the Arctic ??

Transport to the Arctic via major Ocean Currents*

*Source AMAP 2002



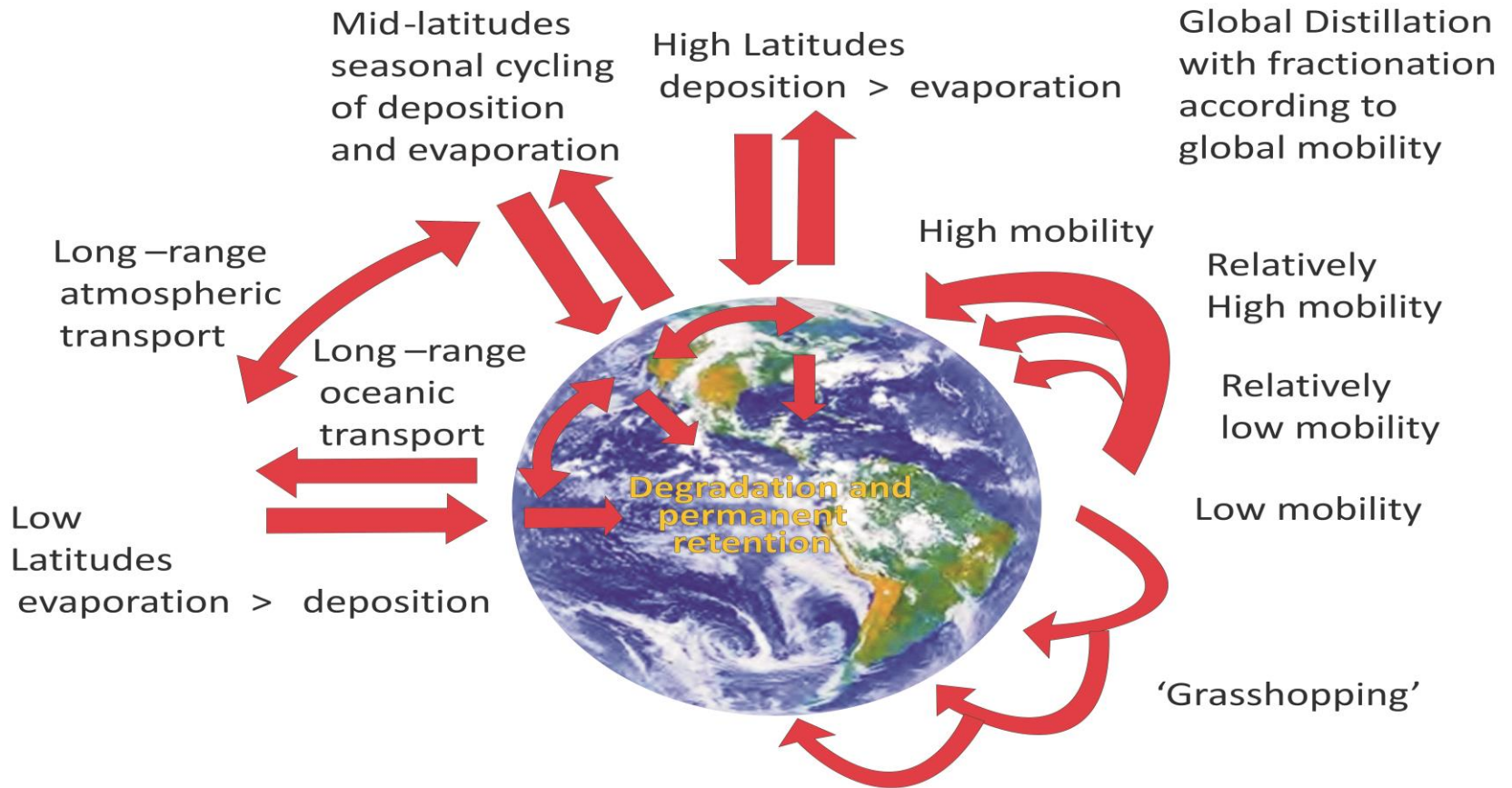
Transport to the Arctic via Atmospheric Currents

-general pattern of movement from the low latitudes to the Arctic*

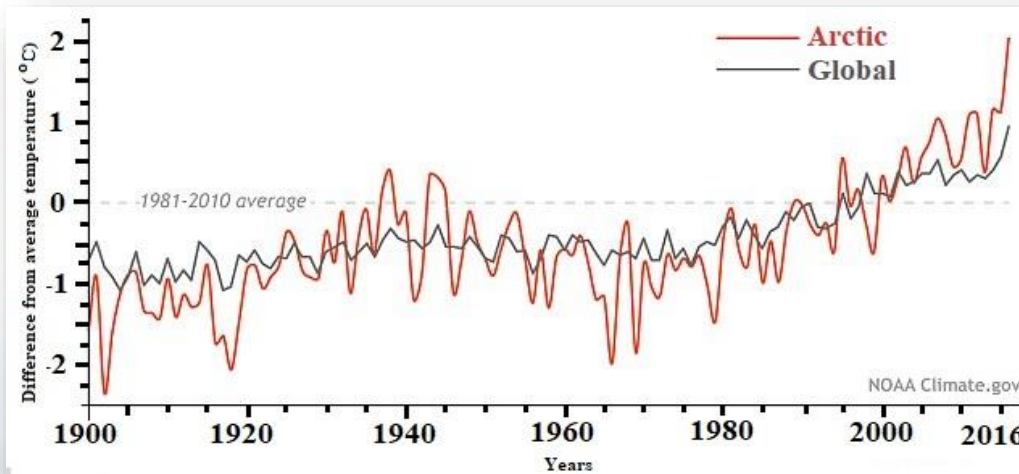
*Source AMAP 2002



How do they



Climate Change and fate of POPs in the Arctic



Modified wind patterns

- Lead to faster and more efficient atmospheric long range transport of POPs

Increasing Temperature

- Increases the secondary emissions from contaminated environments
- Accelerate the atmospheric degradation of POPs

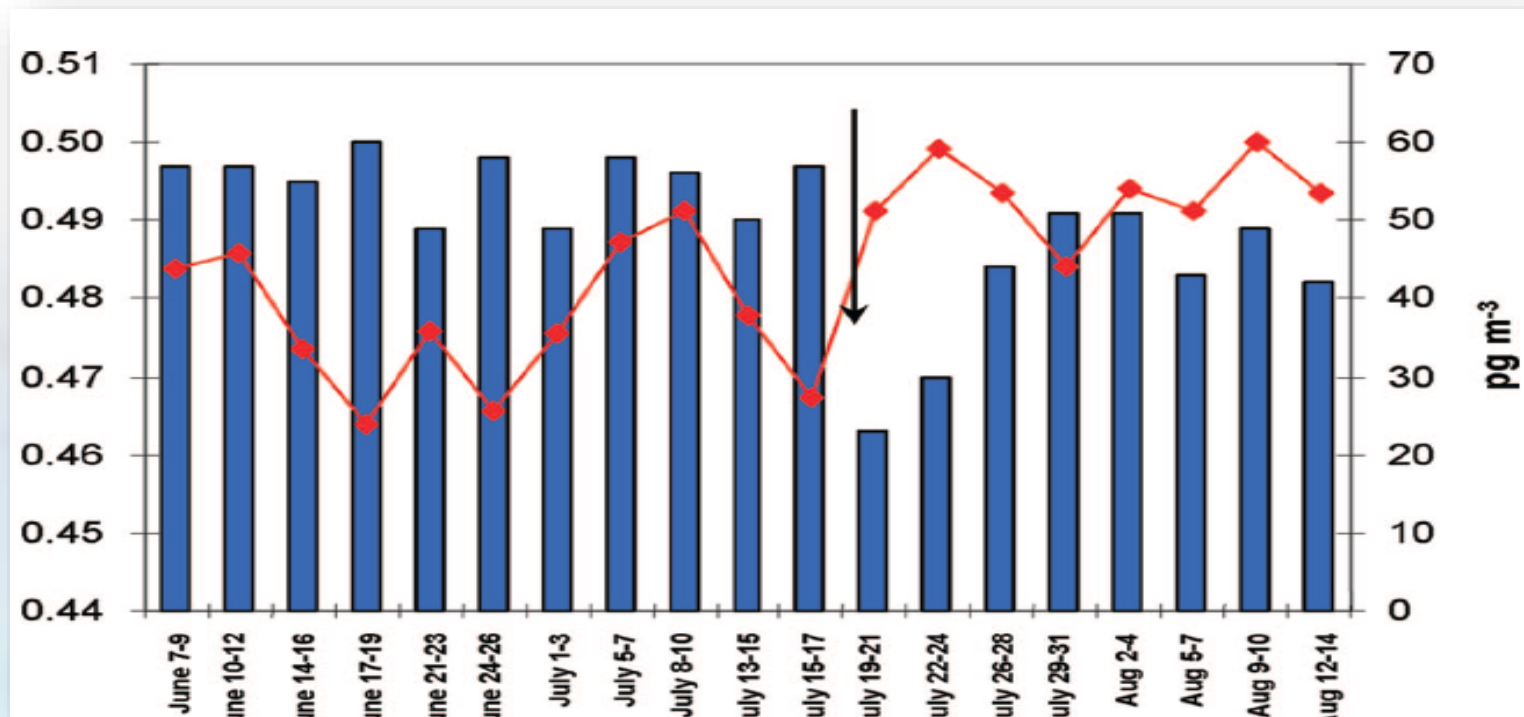
Snow/ice and Glacier melting

- Melting results in release of stored POPs and make them available for transfer to the atmosphere or to aquatic and terrestrial ecosystems

Changing precipitation patterns

- Decreasing precipitation will lead to enhanced volatilization of POPs to the atmosphere
- Increasing precipitation will lead to an enhanced wet deposition of airborne POPs

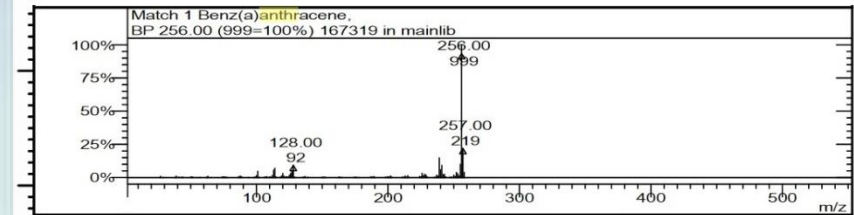
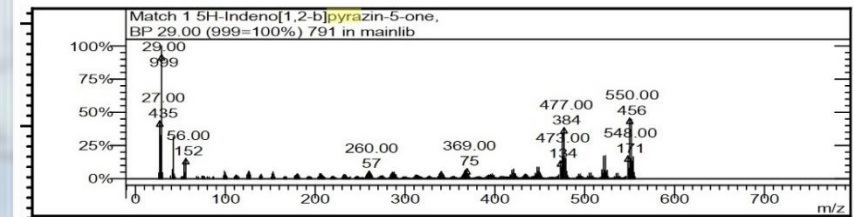
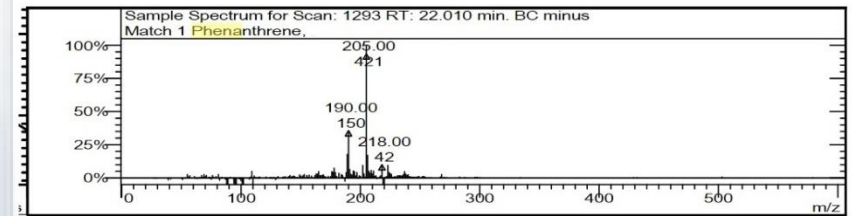
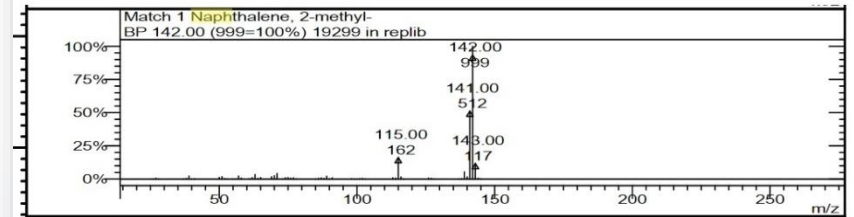
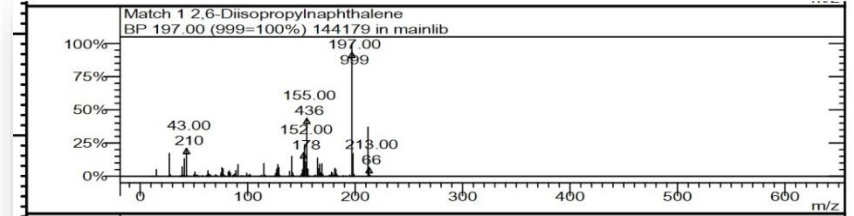
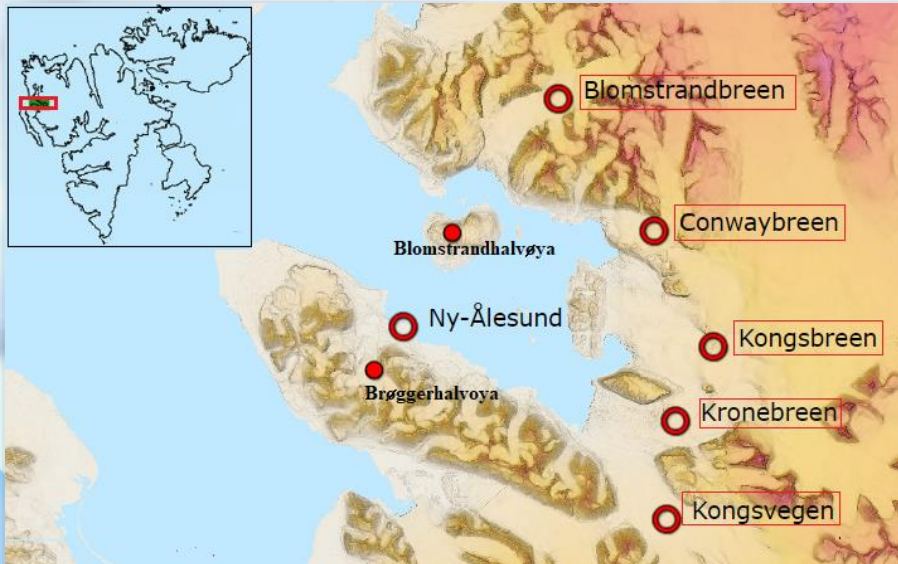
Evidence of climate change and its impacts on POPs in the Arctic



Influence of ice cover on the sea-air exchange of α -HCH

My work : POPs in Ny-Ålesund, Arctic

- 2,6 Diisopropynaphthalene
- Naphthalene
- Phenanthrene
- Anthracene
- Benzo(a) anthracene
- Indeno(1,2,3) Pyrene



Important Points

- **Presence of POPs in Arctic region prove that distance from source is not a factor in its occurrence as a pollutant.**
- **POPs deposited in ice can be released back to the atmosphere when the ice melts, making them available for circulation.**
- **If the POPs enter the food chain and start bio-accumulating, the results could be disastrous for wildlife and humans in the long run.**
- **Further detailed studies are needed to fill the knowledge gap about--**
 - ❖ **Time and spatial trend of pollutants in the Arctic**
 - ❖ **Source apportionment and assessment of source strength**
 - ❖ **The transformation processes as an integrated part of fate assessment of POPs**
 - ❖ **Reliable environmental toxicology and effects studies for the Arctic environment**



"You are not the same as your great-grandparents were. You are partly synthetic."
-UNEP STOCKHOLM CONVENTION

Thank you