IASOA Transports Working Group

May 2, 2018

Attendees: Sara Morris, Chris Cox, Taneil Uttal, Matt Newman, Dorthe Handorf, Elena Konopleva, Ola Perrson, Ralf Jaiser, Timo Vihma, Joseph Sedlar, Jim Overland, Lantao Sun, Xiangdong Zhang

Role Call of group members

Presentation on Diagnosing the Mean Atmospheric Moisture Transport Budget (Newman):

- Atmosphere moisture budget
    - Explore moisture transport by difference time scales
        - Mean moisture budget balance between moisture flux divergence and the water source/sink
    - Winter moisture transport climatology (1968-2007)
        - Mean moisture transport is mostly due to transport by the mean flow
        - Transport by synoptic anomalies is generally greater than transport by climate anomalies, except along west coast
        - Transport by low-frequency anomalies dominates moisture transport into the Arctic
- Seasonal cycle of meridional moisture transport
    - Meridional moisture flux dominated by transport by mean flow for tropics and subtropics
    - Midlatitudes show meridional flux by synoptic anomalies equivalent to meridional flux by mean flow
- Analysis of moisture transport into selected regions
- Meridional moisture transport by synoptic anomalies is important
- Moisture transport is dominated by atmospheric river conditions
    - Total moisture flux compared to moisture flux composited by atmospheric river criterion
- Analysis of moisture and meridional wind climatology
    - High-frequency driven by lateral mixing
    - Low-frequency driven by moisture-wind covariance
- Understanding synoptic vs. low-frequency moisture transport
- Overview of how low-frequency anomalies act to transport moisture in the climatological mean
- Conclusion
    - Mean moisture budget is primarily a balance between moisture transport by the mean flow and mean moisture source/sinks, especially within ocean basins
    - Synoptic and low-frequency variability drive about half of the extratropical meridional mean moisture transport
    - Arctic transport dominated by low-frequency anomalies

Action Items:

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