

# Malfeasance by Powerpoint



**CERES SET  
2-4 May 2006 W'burg**

# Changes of Radiation Budget at High Latitudes

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# Changes of Ice Cover of Arctic Ocean

- GSFC work



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# Effect of Ice Cover on Regional Radiation Budget

- Ice/Snow has high albedo
- Clear ocean has low albedo
- Melting of Ice cover causes increase of absorbed solar radiation ASR
- ASR is greatest in July when Sun is high and ice has had time to melt.



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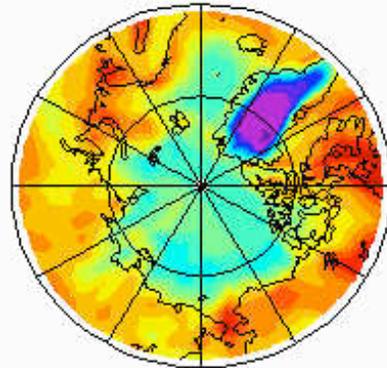
# ERBE and CERES Data

- NOAA 9 scanner data cover July 1985 & 1986.
- NOAA 10 scanner data cover July 1987 & 1988.
- CERES/Terra data cover July 2000 through 2005.

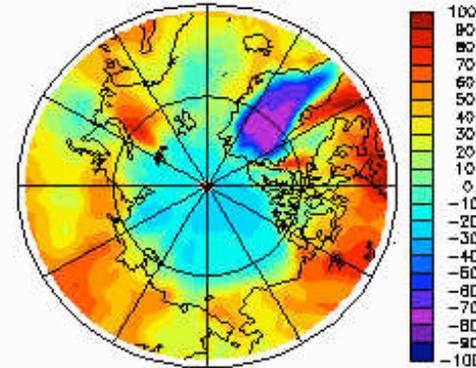


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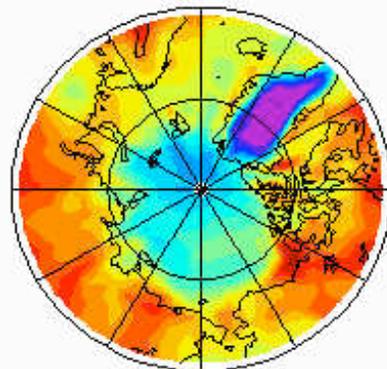
# Net Radiation from ERBE July 1985, -86, -87, -88



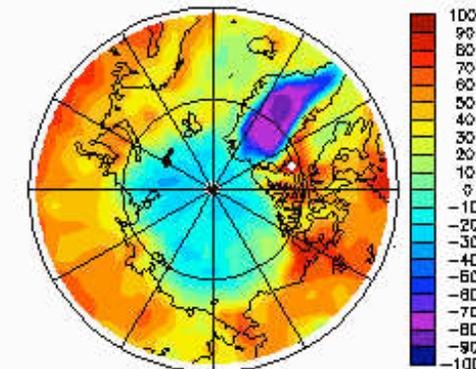
NOAA-9 Net JULY 1985



NOAA-9 Net JULY 1986



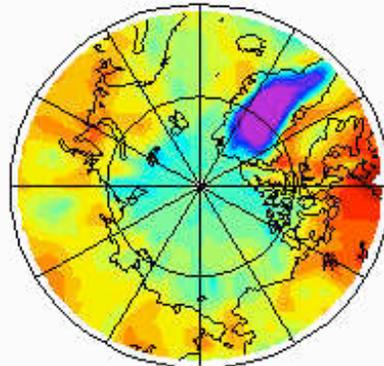
NOAA-10 Net JULY 1987



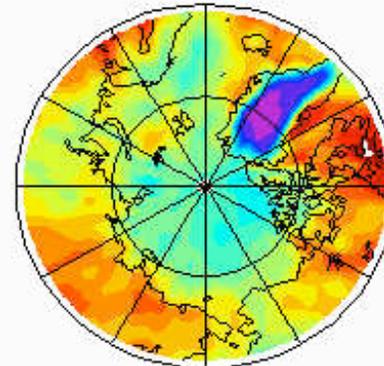
NOAA-10 Net JULY 1988



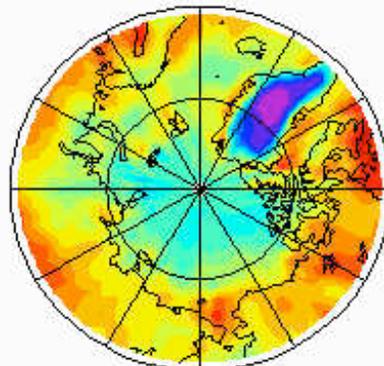
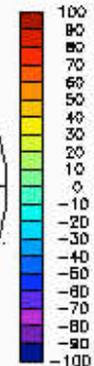
# Net Radiation from Terra/CERES July 2000, -01, -02, -03



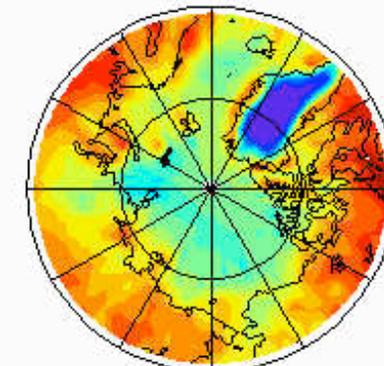
Terra Net JULY 2000



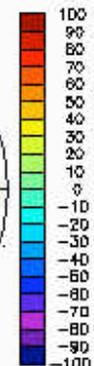
Terra Net JULY 2001



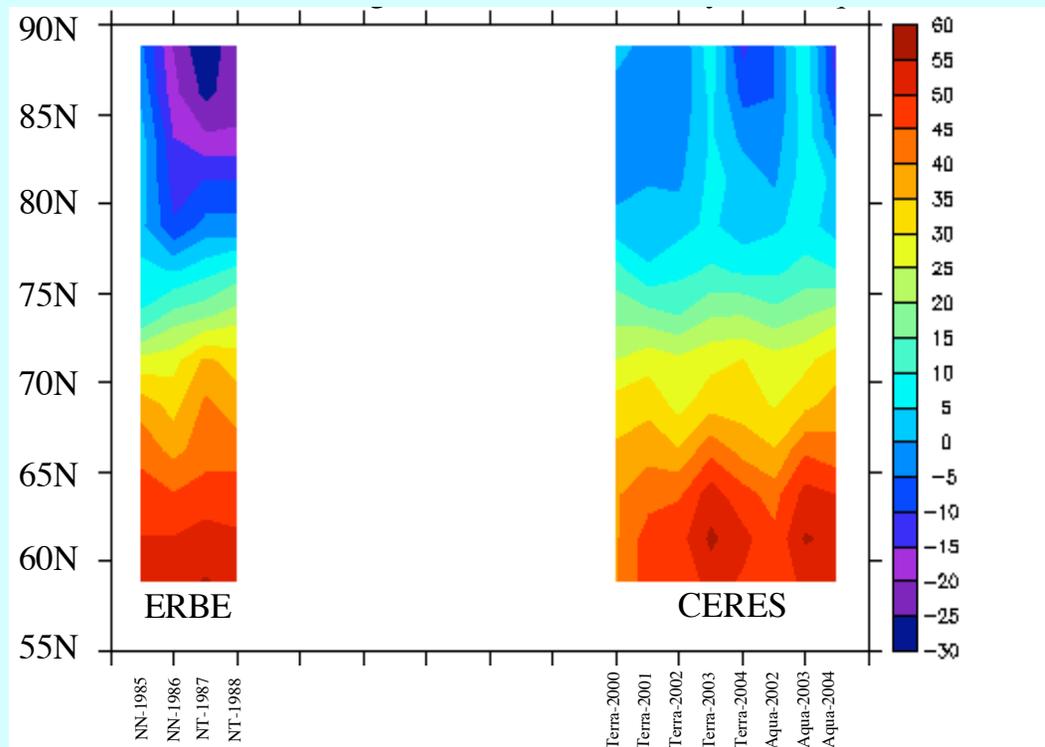
Terra Net JULY 2002



Terra Net JULY 2003

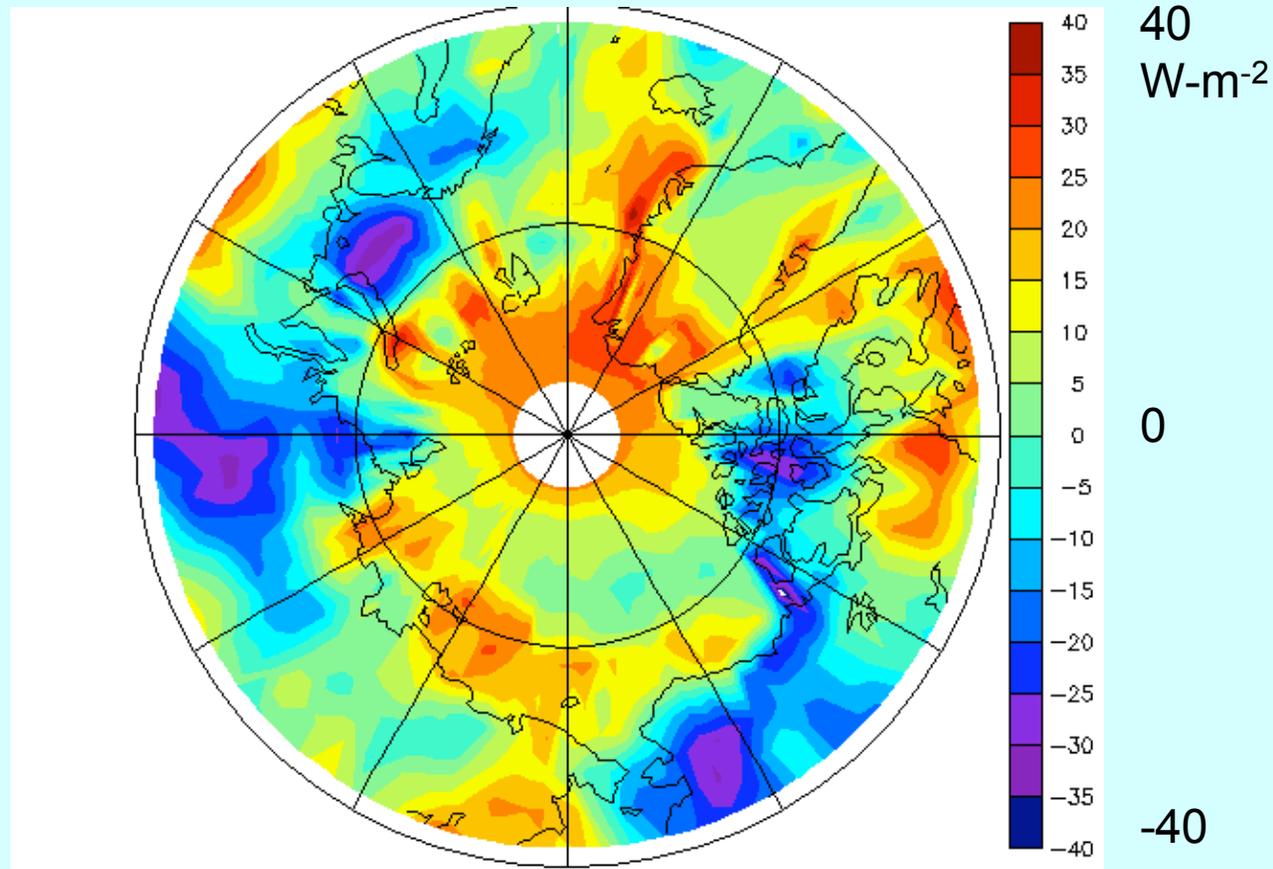


# Zonal Average Net Radiation Flux vs. Latitude and Year



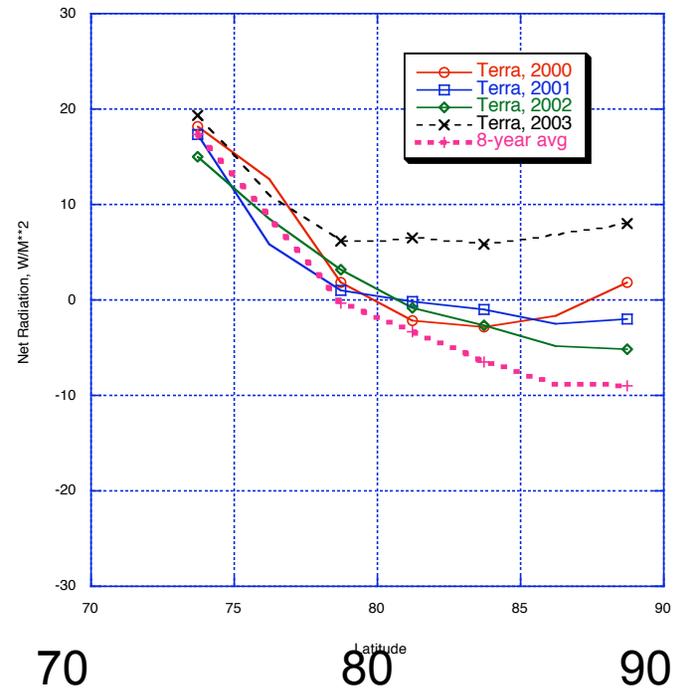
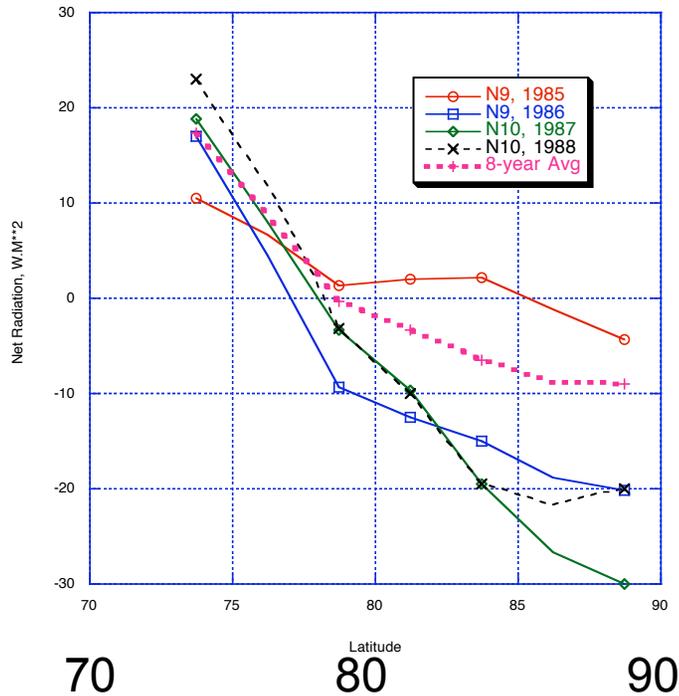
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# Change of Net Radiation from 1980's to 2000's



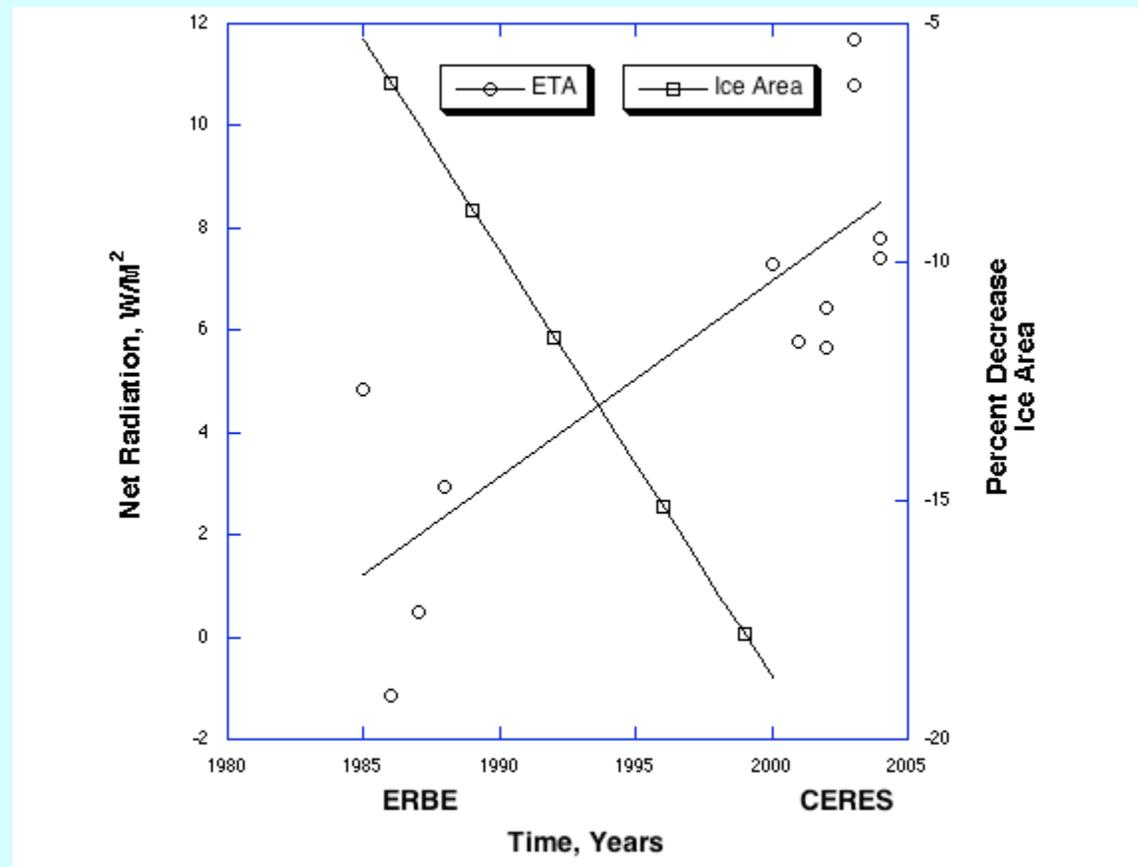
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# Zonal Average Net Radiation over Arctic



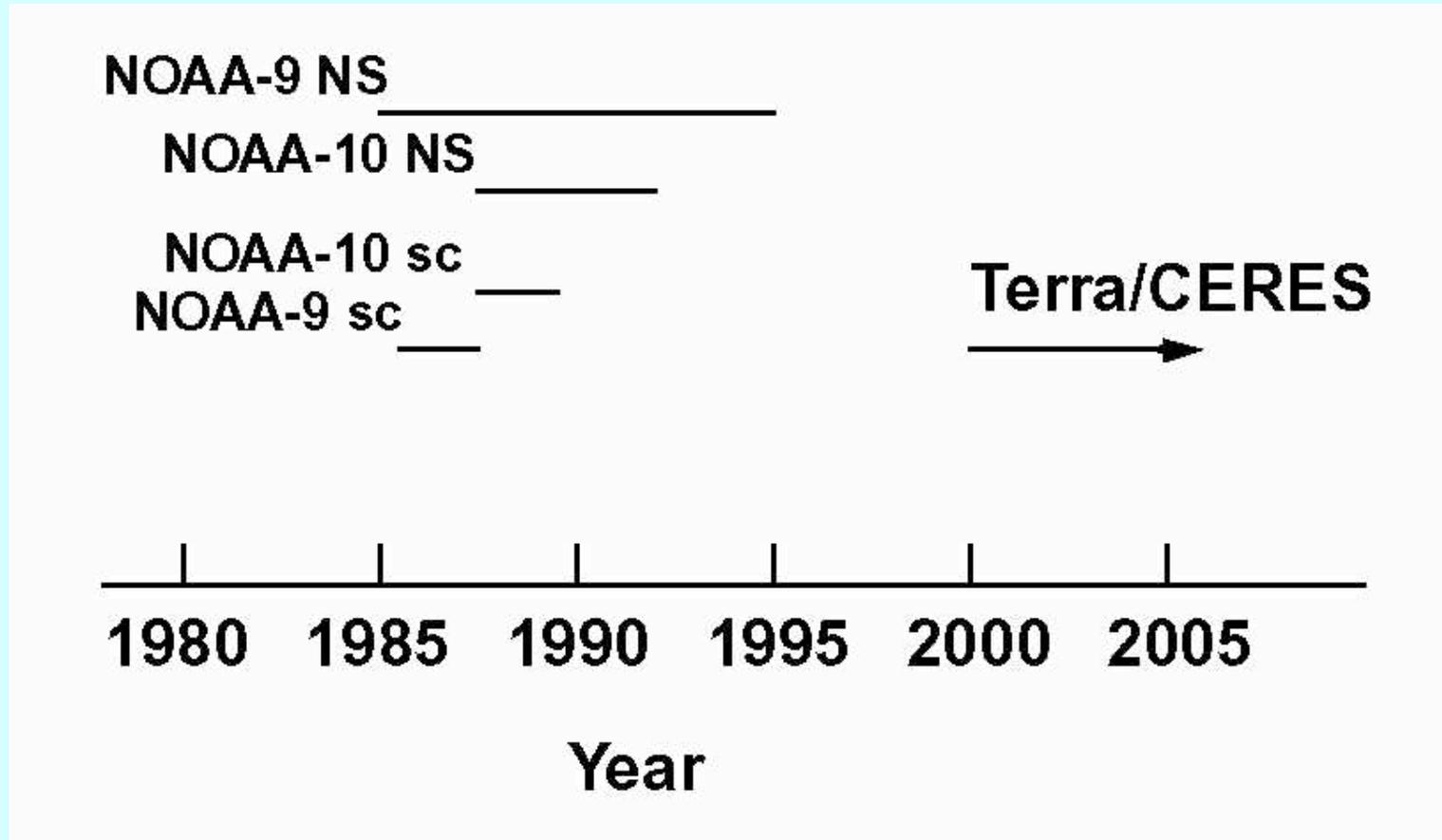
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# Net Radiation and Ice Cover Changes



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# ERBE Nonscanner data would extend data series at high latitudes



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# Conclusions

- OLR changes over Arctic Ocean are small.
- Absorbed Solar Radiation increases by  $10 \text{ W-m}^{-2}$  for latitudes greater than  $70^\circ$  because of albedo increase due to melting of sea ice.
- There is little change of OLR during July for the Arctic Ocean.
- There are variations of radiation over Russia and Canada.



# Ongoing and Future

- We are investigating other months and using SRB data.
- We are checking processes over Russia and Canada.
- NOAA 9 and 10 WFOV data must be put in Public Archive in order to give more years of radiation budget data at high latitudes.



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