



Plans for validation and use of CloudSat data at CCRS

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Summary of proposed activities

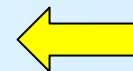
- 1) Validation of radiative fluxes and heating rates using independent method for computations and boundary conditions; comparison with ground and aircraft observations available from MAGS region (Mackenzie basin GEWEX Study) and EC/MSU validation experiments;
- 2) Use of L-3 (cloud layering statistics) for improving surface/atmosphere radiation budget climatology and climate radiative forcing in Northern latitudes. Diurnal cycle from sun-synchronous observations?
- 3) Use of CloudSat cloud detection mask and optical depths for developing improved cloud detection schemes for passive optical sensors, especially in winter conditions (AVHRR/3, MODIS and future VIIRS/NPOES)
- 4) There is also some interest to use CloudSat observations in combination with additional data for ground applications (ice/ snow mapping and surface moisture determination) and biomass burning aerosols (+CALIPSO).

CloudSat data products and our objectives

<i>Product ID</i>	<i>Standard Data Product</i>	<i>Required CloudSat Input</i>
1A-AUX	Level 1A Auxillary Data	DEF_EPHEM, AN_DEM, Raw CPR
1B-CPR	Level 1B CPR	1A-AUX
2B-GEOPROF	CPR Geometrical Profile	1B-CPR 2A-MODMASK AN- STATEVAR
2B-CLDCLASS	Cloud Classification	2B-GEOPROF
2B-TAU	Cloud Optical Depth	2A-MODRAD 2B-GEOPROF
2B-LWC	Cloud Liquid Water Content	2B-GEOPROF 2B-TAU
2B-IWC	Cloud Ice Water Content	2B-GEOPROF 2B-TAU
2B-FLXHR	Atmospheric Radiative Fluxes and Heating Rates	2B-GEOPROF 2B-TAU 2B-LWC 2B- IWC
AN-MODMASK	MODIS MASK	1A-AUX
AN-MODRAD	MODIS RADIANCES	1A-AUX
AN-STATEVAR	Global Anal. Subset along CloudSat Track	1A-AUX
AN-DEM	Digital Elevation Database	1A-AUX

We can contribute here

+
use L-3 data for
radiation budget
climatology

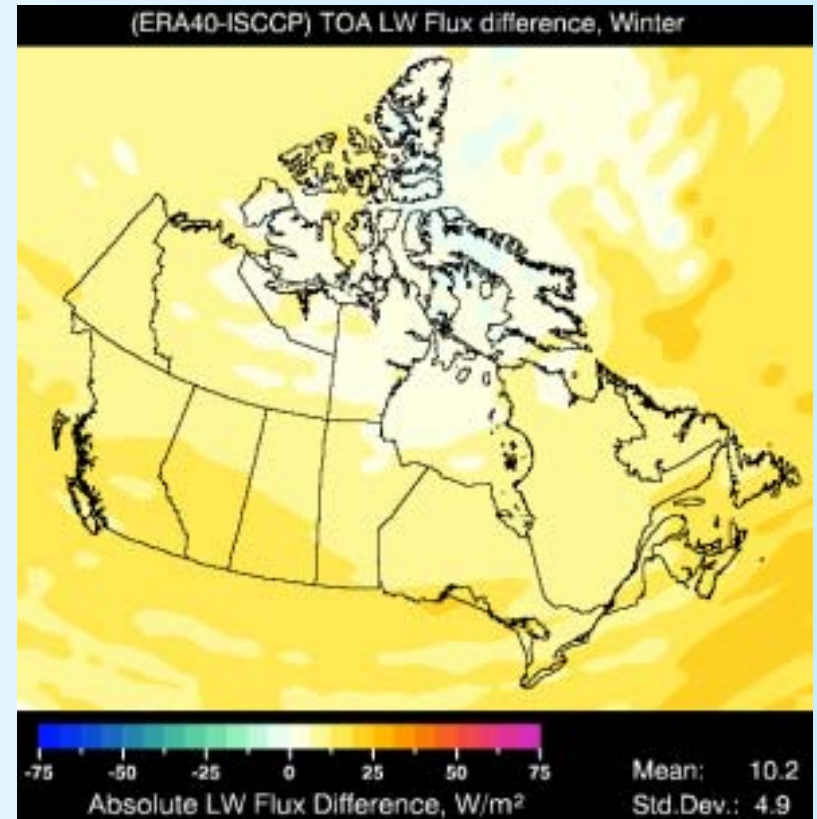
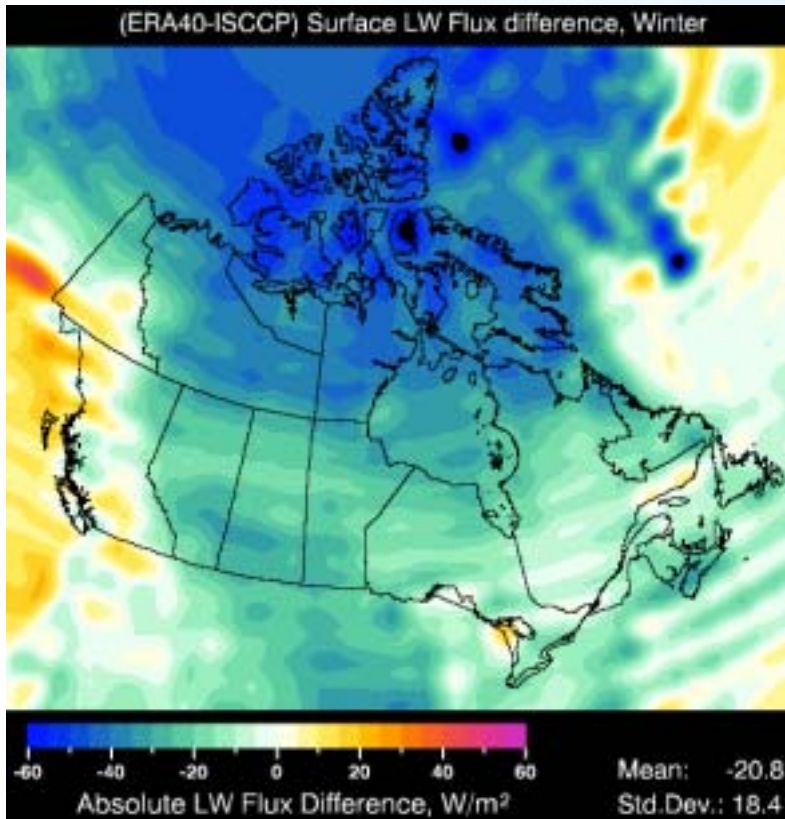


Regional level

Difference between ERA40 and ISCCP FD LW fluxes: Seasonal mean values for 1983-2001 over Canada

surface level

TOA level



Uncertainty in cloud properties causes major differences in the estimates of climate radiation budget and radiative forcing of climate change