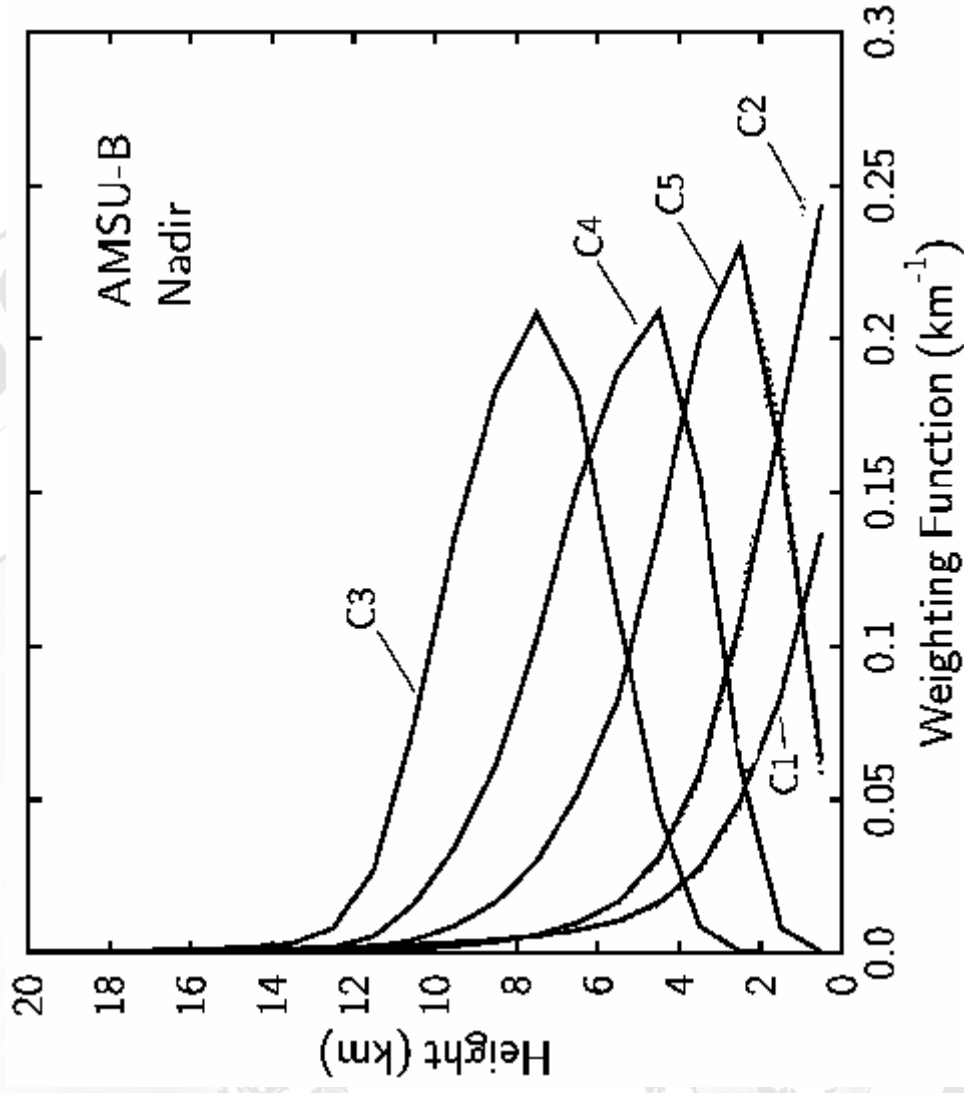# Improving NWP models

- NWP - HIRLAM 48 h forecast.
- Short cut off – less than 2 h.
- Initial state error has strong affect on forecast quality.
- Artic vital part of model area.
- Arctic is well covered by polar orbiting satellites.
- Successful assimilation of AMSU-A and –B over sea.
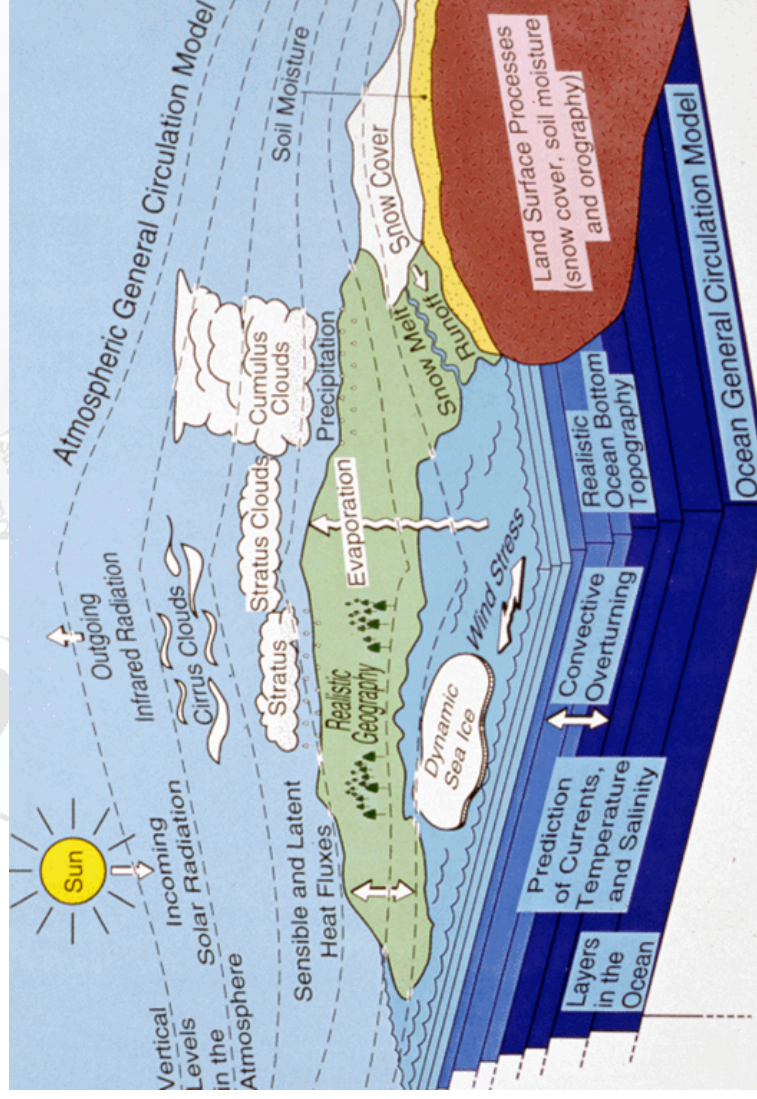- Extend to sea ice.

Humidity assimilation

AMSU-B
Nadir

- **AMSU-B:**
  two window channels &
  three humidity channels.

- **Sensitivity depends on**
  temperature & humidity.

- **Need co-located AMSU-A**
  for temperature.

- **Artic is dry – low peaks.**

- **Need good description**
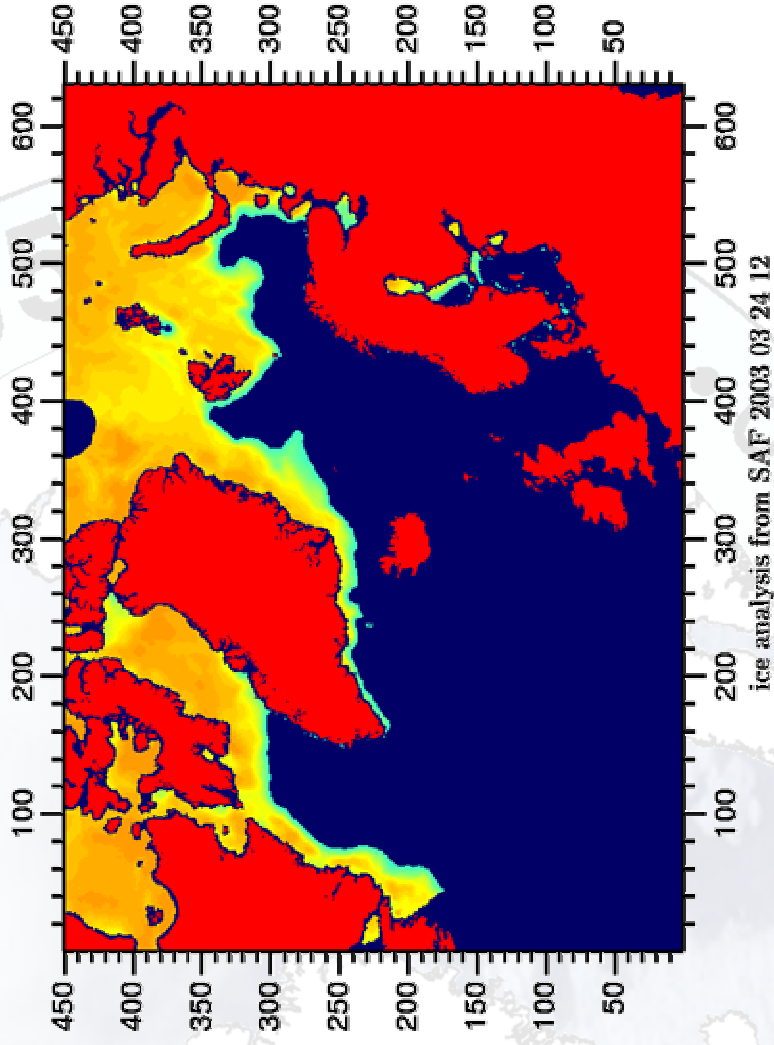 **of surface emissivity.**

Surface heat flux

- Sea ice reduces flux up to two orders of magnitude.

- HIRLAM use full coverage within ice edge.

- New surface scheme with different tiles.

- Ice concentration from IOMASA subproject.

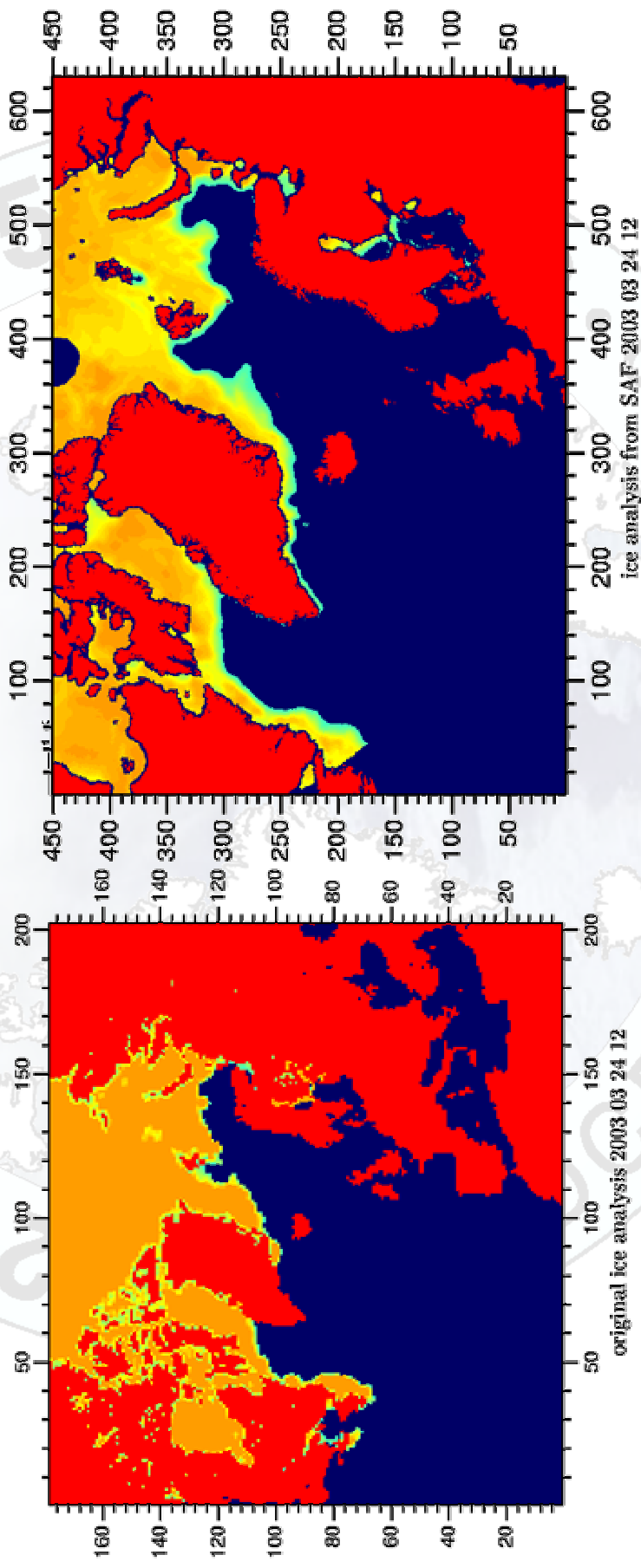- New formulation for stable conditions.

Setup of operational data stream – ice concentration

ice analysis from SAF 2003 03 24 12

- Test data from the Ocean & Sea Ice SAF.
- Resolution – 10 km.
- Super-observations on HIRLAM scale – ca 40 km.
- Analysis with successive corrections.
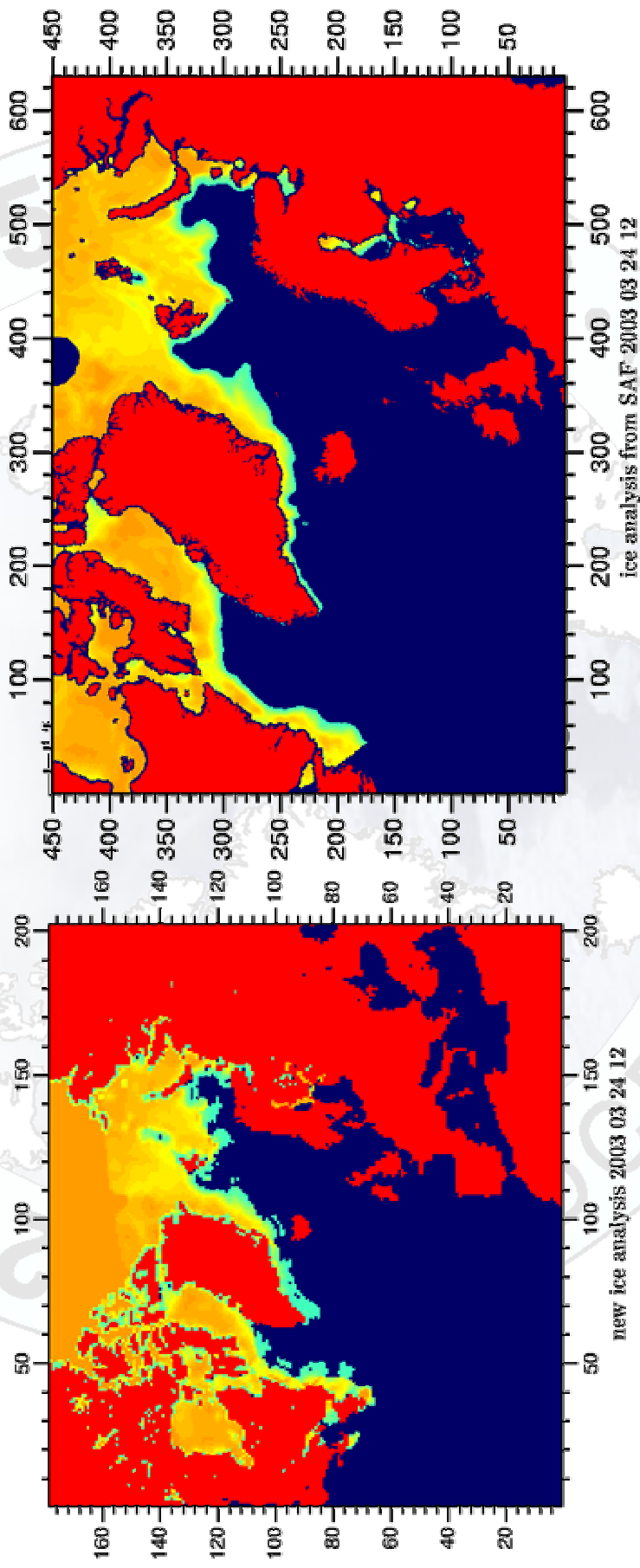- Modify SST and fraction of water afterwards.

Climatological ice concentration

Ocean & Sea Ice SAF

ice analysis from SAF 2003 03 24 12

Old HIRLAM

original ice analysis 2003 03 24 12

Assimilated ice concentration

Ocean & Sea Ice SAF

ice analysis from SAF 2003 03 24 12

New HIRLAM

new ice analysis 2003 03 24 12