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Carbon Balance under Changing Processes of Arctic and Subarctic Cryosphere (CARB-ARC)

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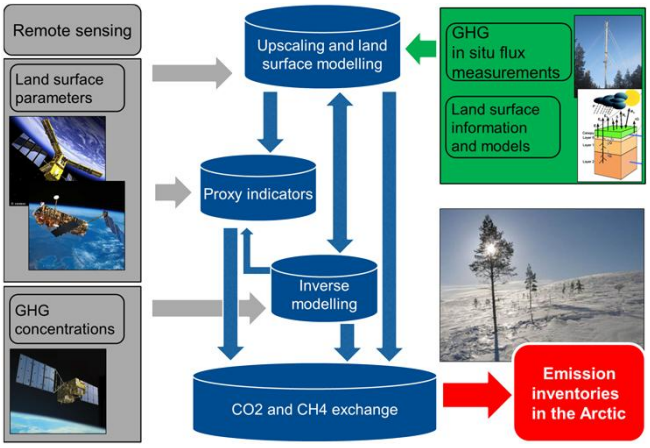
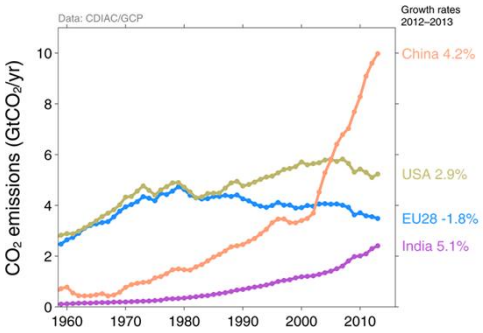
Overall strategy of CARB-ARC

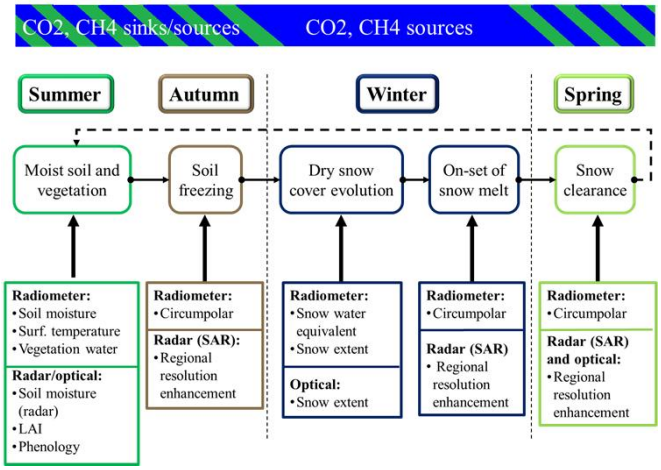


Increased need for carbon monitoring:
Anthropogenic CO_2 source growth impacts natural (ecosystem) sinks and sources through climate change feedbacks



Source: CDIAC; Le Quéré et al 2014; Global Carbon Budget 2014

Suggested approach combining current and near-future satellite sensors

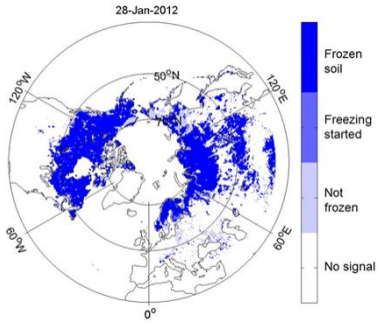


Suggested approach: Advanced assessment of carbon balance at high latitudes requires the combination of ***in situ*** **data** (flux measurements), **processes modelling** and the development and implementation of an **integrated Earth Observation monitoring system** of atmospheric and terrestrial cryosphere processes related to carbon exchange

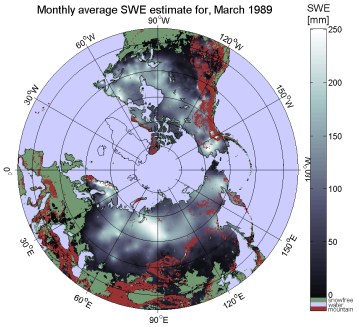
Advanced approach to monitor terrestrial processes: Synergistic use of space-borne optical and microwave sensors to monitor the status of soil-vegetation system including phase changes of water:

- Use of ground station *in situ* data as a fundamental part of the monitoring system

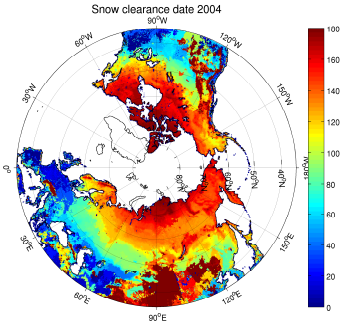
Available novel satellite products by CARB-ARC



Soil frost status of the Northern Hemisphere based on ESA SMOS



GlobSnow Snow Water Equivalent (SWE), SSM/I + in situ snow depth; http://www.globsnow.info/swe/archive_v2.0/



Snow melt day estimated from passive microwave data (SSM/I)