

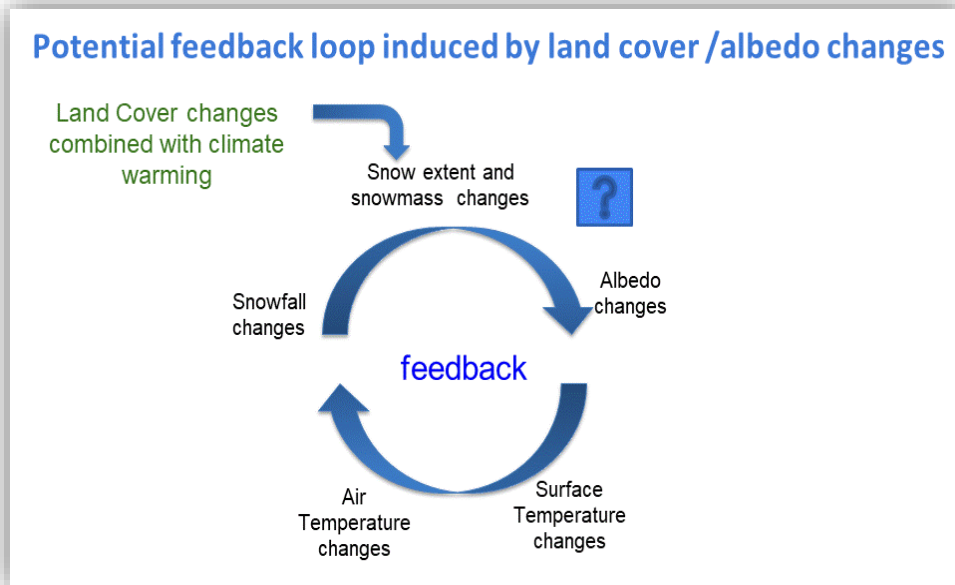
WP5.6: Snow dynamics impacts on temperate / high latitude climate

Proposed by IPSL (LSCE and LMD teams)

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Main project objective

⇒ Improve our understanding and modeling of snow-vegetation-atmosphere feedback, with the IPSL climate model (LMDZ-ORCHIDEE) and various CCI products (especially snow products)



Planned work

• Data Analysis (WP1)

- Consistency check/analysis between Snow Cover (mass & extent), Land Cover and other CCI products (LST; Fire; Biomass; LAI) + Albedo
 - CCI-SNOW (SCF and SWE): MODIS (1km, 2000 - 2020) and AVHRR (5 km, 1982 - 2018)
Making use of SCFV (top of forest) versus SCFG (ground cover)
 - MR-HR Land Cover: 300 m / 30 m data mapped onto PFT at 1km
 - LST (0.05°, 1995-2020); Fire (MODIS; 2001 - 2020); BIOMASS (3 epoch data 1990, 2010, 2018)
- => Analysis of the differences btw short & tall vegetation and Deciduous & Evergreen

• ORCHIDEE model evaluation (WP1)

- Evaluate the simulated snow cover dynamics (mass and extent) and snow albedo using simulations with prescribed climate forcing (e.g., ERA5)
- Define a set of key “homogeneous points” for the identification of model biases

• Planned work

• **Model improvement (WP1 & Synergies with others projects)**

- Improve soil thermics (carbon impact on soil thermal properties; ongoing work) and SCF parameterizations
- Account for Shrubs & the representation of Snow - Veg dynamics (Druel et al. 2019):
Work in collaboration with ongoing H2020 GreenFeedback project)

• **Snow model parameter optimisation (WP2)**

- Model sensitivity experiments to identify critical parameters (Morris / Sobol approaches)
- Multi-site optimization (local/global approaches, History Matching...) using Albedo, SCF and SWE data

• **Coupled Model simulations (WP3 - not funded yet !)**

- Use the Coupled LMDZ - ORCHIDEE model (AMIP type simulation: fixed SST, SIC)
- Historical simulations to analyze the impact of the “improved snow model” on surface-atmosphere feedbacks

Thank you...