

SvalGlac

Glacier dynamics modelling group activities

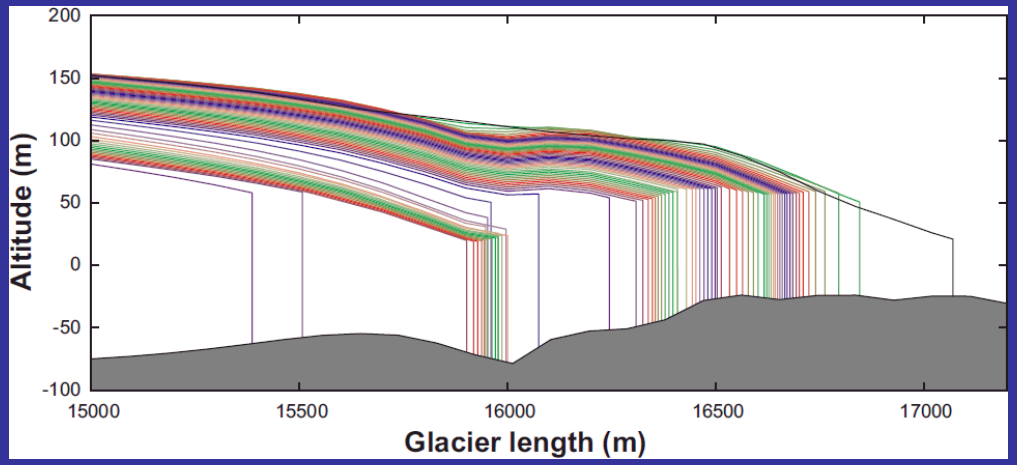
GROUP MEMBERS:

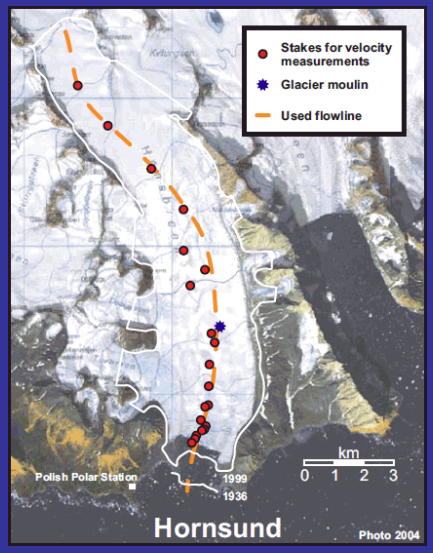
Bucchignani, Edoardo (Italy)
Cerimele, Maria Mercede (Italy)
Corcuera, María Isabel (Spain)
Cuadrado, María Luisa (Spain)
Dunse, Thorben (Norway)
Forieri, Alessandro (Italy)
Mansutti, Daniela (Italy)
Navarro, Francisco (Spain)
Otero, Jaime (Spain)
Pettersson, Rickard (Sweden)
Schäfer, Martina (Finland)

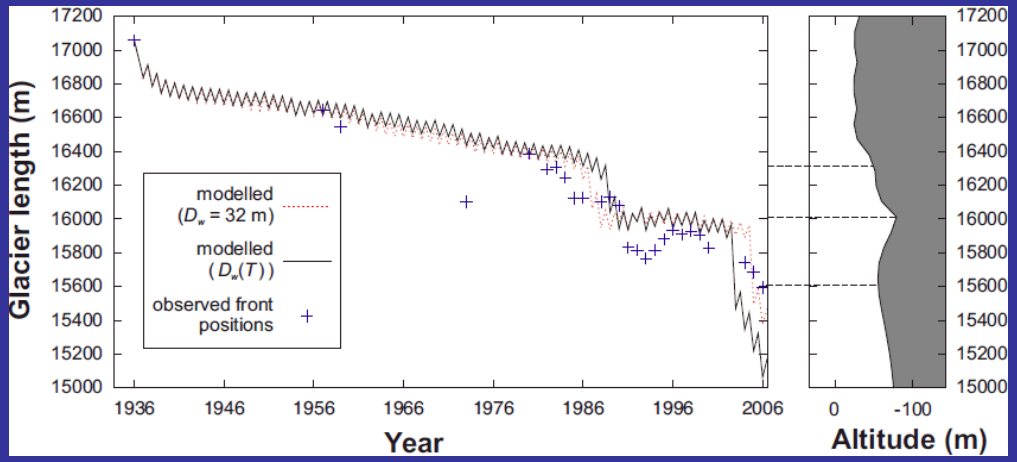
SvalGlac Steering Committee Metting, Oslo, 30 October 2011

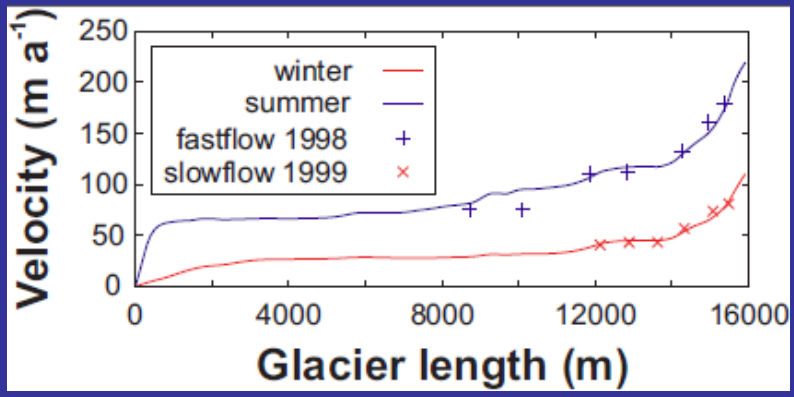
Spanish team:

- Performed 2D full-Stokes (Elmer) modelling of the transient dynamics of Hansbreen, including test of a Benn-type calving low.
- Simulated period 1936-2007.
- Analized model sensitivity to changes in mass balance & amount of water filling the crevasses (constant, and as function of temperature).



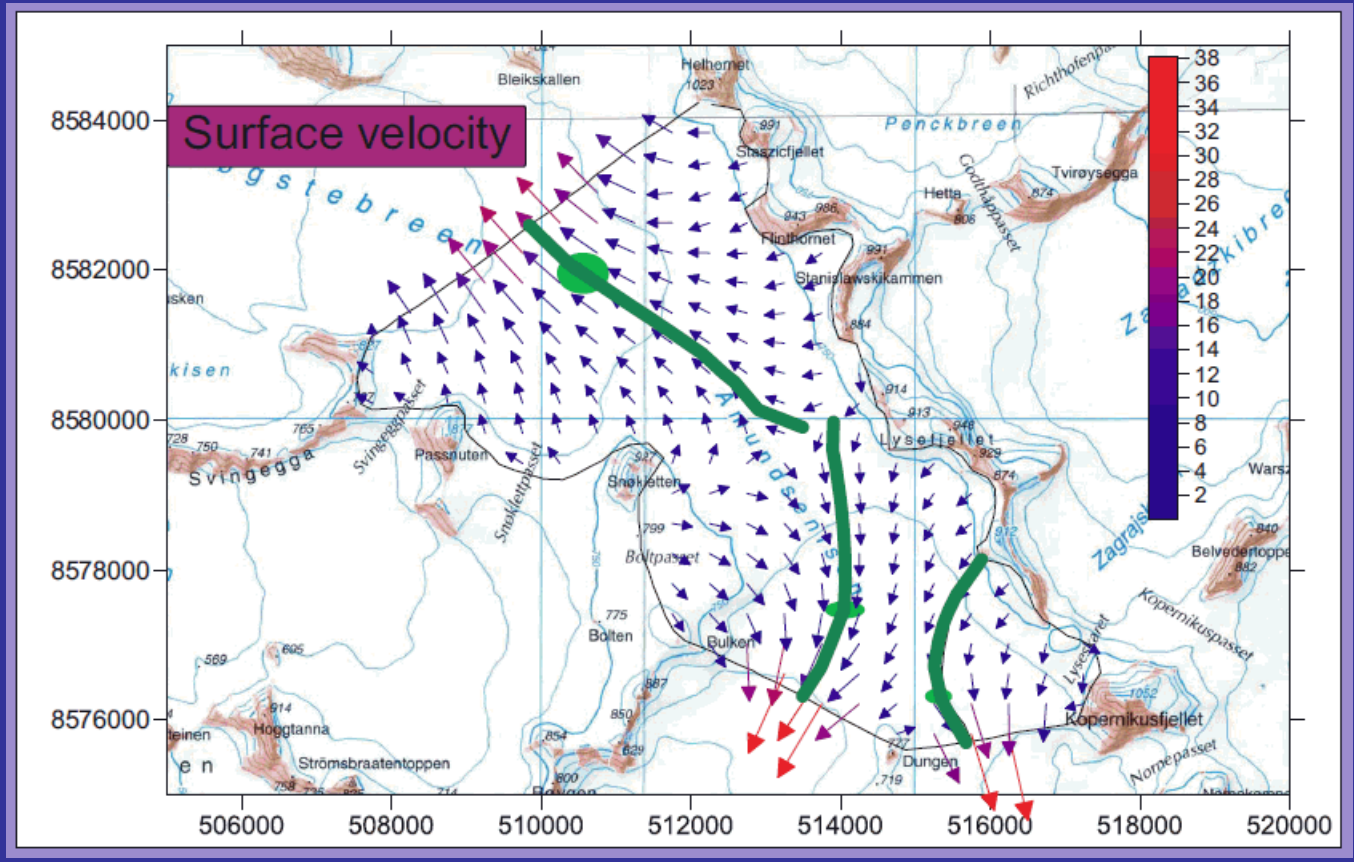






Spanish team (cont.):

• Performed 3D full-Stokes (Elmer) modelling of the steady-state dynamics of the Amundsenisen icefield. The flow field has been used to define flowline geometry, as well as initial and boundary conditions, supplied to the Italian team for more detailed 2D-modelling of thermo-mechanics, including moving boundary between basal ice and possible subglacial lake.



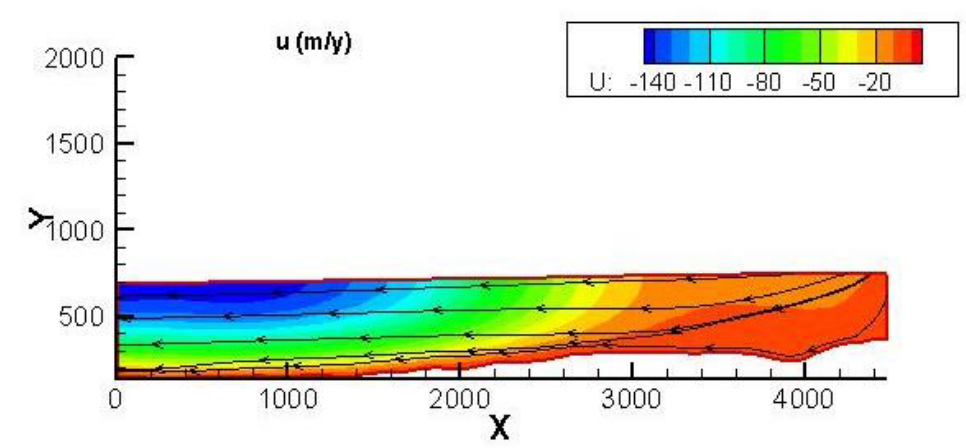
Italian team:

• Implementation, debugging and validation of in-house made code for the diagnostic study of a subglacial lake. Testing (in progress) on Amundsenisen area upon data provided by Jaime Otero and Paco Navarro.

• Aspects already included:

- Viscosity dependence on temperature.
- Ice/water phase change temp. dependence on hydrostatic pressure.
- Steady air/ice (material) interface, no accumulation/ablation.
- Ice body sliding on bedrock.
- Effect of pressure on sliding.
- Water density dependence on temperature.

(Further details already given in Italian national team report)



Finnish team:

- Modelling of Paierlbreen not initiated yet. Waiting for availability of data on:
  - Bedrock: to be provided very soon by Spanish-Russian teams upon processing of GPR data from helicopter flight spring 2011, plus some earlier ground-based Polish GPR data.
  - Surface: DEM preparation underway by Gosia (Polish team).
  - Velocities: ongoing work by Chinese student. Also available info from time lapse camera and (more recently) stereophotos.

Related symposium contributions/publications in preparation:

- J. Otero, F.J. Navarro, J.J. Lapazaran, M. Grabiec, D. Puczko, C. Molina and A. Vieli (2011): Modelling the variations of the calving front position of Hansbreen, Svalbard. International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean. La Jolla, California, USA, 5-10 June 2011. *Poster contribution and paper in preparation for J. Glaciol.*

- J. Otero, F.J. Navarro, J.J. Lapazaran, E.V. Vasilenko and P. Glowacki: A three-dimensional dynamical model of Amundsenisen icefield, Svalbard. Geophysical Research Abstracts, Vol. 13, EGU2011-6257, 2011. EGU General Assembly 2011. *Poster presentation. To be used partly in paper, in preparation for J. Glaciol., on surface changes and dynamics of Amundsenisen.*