Geophysical Research Abstracts, Vol. 7, 05090, 2005
SRef-ID: 1607-7962/gra/EGU05-A-05090

Energy and hydrological balance of the Adamello Glacier as an indication of current climate change

R. Ranzi (1), S. Taschner (1)

(1) Dept. of Civil Engineering, University of Brescia, Italy (ranzi@ing.unibs.it)

The energy and hydrological balance of the Adamello Glacier, the largest glacier in the Italian Alps measuring 18.2 km2 in size in 1992, was computed for the 2002 and 2003 melt seasons, from April to September. A network of meteorological stations in the surrounding area provided precipitation, global radiation, wind speed, air temperature and humidity data. One of these stations was installed at Passo della Lobbia Alta, in the core of the glacierised area at an altitude of 3020 m a.s.l. and provided also hourly net radiation measurement in the month of August, when the ice melt rate is higher. Hourly streamflow measurements at a hydrometric station downstream provided data to verify the timing and the rate of the simulated ablation. Albedo maps were derived by processing two ASTER images retrieved during the 20.06.2003 and 23.08.2003 overpasses of the TERRA satellite, scheduled also for the GLIMS project. From those images and others collected in the 2002, having a 15 m resolution in the 520-860 nm spectral range, a retreat of the glacier's terminus of 165 m since 1997 was estimated and of 2085 m since the beginning of the XIX century, at the end of the Little Ice Age. The altitude of the terminus passed from 1780 m at that time to the actual 2580 m a.s.l. With an estimated glacier's mass loss of about 1400 mm and 2800 mm in the 2002 and 2003 melt seasons, respectively, a continuous retreat in the next decades toward a new equilibrium size and shape is foreseen.