

French ITASE and ITASE related activities, recent and future

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While the french polar institute (IPEV) hauls hundreds of tons of cargo over thousands of km each year, to supply the French-Italian Concordia station at Dome C, logistical support for surface scientific expeditions like ITASE is still limited. In the recent years, much of the direct french contributions to ITASE have been in partnership with our Italian colleagues who provided the logistics. The last such collaboration was in 2000-2001. During that campaign, sites of older accumulation determinations were revisited. The more recent determinations based on atmospheric-bomb horizon dating proved significantly different from (lower accumulation than) the older ones. A complete re-evaluation of accumulation reports in the 90-180°E sector of Antarctica (East Wilkes – Victoria Lands) in the last 50 years was thus carried out, all reports being quality controlled based on the method of determination used (Magand et al. 2007). Quality-control filtering results in a significant reduction of the best estimate of plateau accumulation, with potential impact on climate model performance evaluation (Genthon et al., 2008a).

More recently, the GLACIOCLIM-SAMBA observatory (<http://www-lgge.obs.ujf-grenoble.fr/~christo/glacioclim/samba/>) was deployed and surveyed since 2003-04, to monitor the surface mass balance at the coast of Adélie Land, at the Dome C, and along a 150-km transect directed inland from the coast. The observatory is process- and model-validation oriented, with at least one full annual survey, and deployment of various meteorological and nivological automatic instruments on the field. Out of 3 different, up-to-date, high-resolution meteorological and climate models, only one properly reproduces the observed meso-scale variability of accumulation along the transect. While much of the ITASE activities concentrate on the low-accumulation Antarctic plateau, the coast to plateau transition region is where accumulation is largest and predicted to change most in this century (Genthon et al. 2008b). Accumulation monitoring along transects in the coast-plateau transition zone, like that deployed as part of GLACIOCLIM-SAMBA, are thus crucial to better evaluate and improve climate models used to predict Antarctic surface accumulation changes, and impact on sea-level.

The French and italian contribution to TASTE-IDEA, the IPY multi-national ITASE traverse, was delayed twice due to logistical constrains. Instead, in 2006-07 a few shallow cores and pits were sampled during the GLACIOCLIM-SAMBA transect activities and analyzed for water isotops, chemical species, and artificial radionuclides (absolute dating), in an attempt to reconstruct annual variations of accumulation and chemical tracers. Annual records are crucial to properly validate variability and trends in climate models (Genthon et al. 2005). As this proved failry successful in Adélie Land, more such reconstruction are planned with the GLACIOCLIM-SAMBA logistics, while the first leg of TASTE-IDEA, from Talos Dome to Dome C, is now scheduled for 2009-2010.

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