Plinius Conference Abstracts
Vol. 12, Plinius12-80
12th Plinius Conference on Mediterranean Storms
Corfu Island Greece, September 2010

regional statistical downscaling of wind

T. Salameh (1), M. Vrac (2), and P. Drobinski (3)
(1) LSCE Paris France, (2) LSCE Paris France, (3) LMD Paris France

In a complex terrain, accurate and rapid determination of wind components is a challenge for applications like evaluation, forecast and future projections of wind hazards, wind energy and pollutant transport, among others. This work presents an extension of a statistical method used to downscale local wind components in a mountainous environment in southern France. Our approach is originally based on Generalized Additive Model (GAM) which relates large-scale atmospheric variables to local wind. In a previous work (Salameh et al. 2008), downscaling was performed at station location. Now, applying our model to specific types of regional circulations allows to downscale winds in regions void of any measurements. This new approach is evaluated by removing measurements obtained at station locations from a meteorological station network used to calibrate the model and evaluate the downscaled wind with the measurements excluded from the dataset. This comparison shows that our method has a considerable improvement and a reduction of the bias of about 10 times. We also assess the sensitivity of our model to initial conditions data type, by comparing the downscaling of ERA-40 and IPCC climate run between 1991 and 2001.