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Temporal variability of snow characteristics over the Aral Sea region based on surface measurements, NOAA satellite, and reanalysis data

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It is well known snow plays important role in the climate systems through both direct and indirect feedbacks. Thus a study of seasonal and interannual variability of snow characteristics in the Syrdar'ya and Amudar'ya river basins supplying the Aral Sea is a necessary step for a water management in this problematic zone. An analysis of the annual cycle and interannual variability of total SWE (Snow Water Equivalent) and SCA (Snow Cover Extent) obtained over the Aral Sea region is carried out using different type of snow data such as: surface measurements, NOAA satellite and Reanalysis data. We analyzed simultaneous and lagged relationships between main Syrdar'ya and Amudar'ya river runoffs and SCA and SWE data in the rivers basins. It was shown what both type of data SCA and river runoffs have strong negative correlations for simultaneous connection. Climatological patterns of snow distribution in term of snow depth characteristics in different parts of Aral Sea region were determined. Snow depth trends for period from 1966 to 2000 and their relationship with surface air temperature trends for corresponding period were also analyzed. Several studies have focused on seasonal and interannual variability of SWE based on Reanalysis data; however, so far there is no detailed study about applicability of this type of data. A comparison between ECMWF, NCAR/NCEP Reanalysis and observational snow data was also performed assessing the ability of Reanalysis data to simulate seasonal SWE and also in determining whether snow anomalies simulations in past have been realistic in the study region. Significant improvements were found for NCAR/NCEP Reanalysis-2. Results of the validation of two Reanalysis data sets in term of simulating of seasonal SWE variability averaged over Aral sea region demon-

strates reasonable coincidence with observations for the late autumn and early winter time. This work has been supported by the INTAS Project 03-51-5296, RFBR grant 04-05-65099.