

Assignment 4

Hand in answer on or before 21 May 2014

Problem 12.3 (p. 686). Testing the model assumptions concerning the water cycle with reanalysis data

Investigate the realism of the model assumptions concerning the water cycle (section 12.4). Do this for a particular month or year. Restrict the analysis to the zonal mean.

The principal model assumptions are that (1) the relative humidity at the ground is 75%, (2) total precipitation is instantaneously in balance with total evaporation, (3) the Bowen ratio is 0.25 at all latitudes, (4) local precipitation is 80% of the locally evaporated water, except in the ITCZ, (5) total precipitable water vapour is equal to the density of water vapour near the surface times the scale height (eq. 12.19).

You need to retrieve the following fields from the ERA-Interim website: *net radiation* at the Earth's surface, *sensible heat flux* from the Earth's surface to the atmosphere, *evaporation* at the Earth's surface, *precipitation*, *precipitable water vapour* and the *temperature* and *dewpoint* at 2 m (from which you can retrieve the *relative humidity*) as a function of latitude.