



Contrasting land-climate with sea-climate feedbacks

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Since soil-moisture shows a memory of several months in many regions of the world, understanding feedbacks between soil-moisture and the atmosphere offers the potential for improved predictability of the often highly stochastic atmospheric variables. Feedbacks between soil-moisture or evapotranspiration and atmospheric variables (mostly temperature and precipitation) are often studied by numerical experiments, in which the effects of different soil states on the atmosphere are analysed. Statistical feedback analysis of climate model output has complemented these numerical experiments. Hot spots identified by numerical experiments and by statistical feedback parameters agree in general. This paper statistically analyses the GSWP2 data-set w.r.t. soil-moisture-precipitation feedbacks and compares them to SST-precipitation feedbacks. It is found that for some of the previously found soil-moisture-precipitation hotspots in fact an SST-precipitation and/or an SST-soil-moisture-precipitation feedback is dominant. This allows for the classification of the feedback hotspots which are (*i*) due to soil-moisture-precipitation, (*ii*) SST-precipitation or (*iii*) SST-soil-moisture-precipitation feedbacks. An analysis of GCM simulations (20C3M and A2 from the IPCC AR4) complements the GSWP2-classification of hotspots.