

ERA-Interim/Land: A global land surface reanalysis dataset



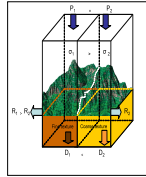
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ERA-Interim/Land is a global land-surface reanalysis dataset covering the period 1979–2010 recently made publicly available from ECMWF. It describes the evolution of soil moisture, soil temperature and snowpack. ERA-Interim/Land is the result of a single 32-year simulation with the latest ECMWF land surface model driven by meteorological forcing from the ERA-Interim atmospheric reanalysis and precipitation adjustments based on monthly GPCP v2.1 (Global Precipitation Climatology Project).

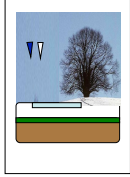
Hydrology-TESEL

Balsamo et al. (2009)
van den Hurk and Viterbo (2003)
Global Soil Texture (FAO)
New hydraulic properties
Variable infiltration capacity & surface runoff revision



NEW SNOW

Dutra et al. (2010)
Revised snow density
Liquid water reservoir
Revision of Albedo
and sub-grid snow cover

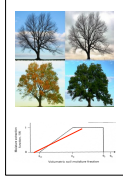


NEW LAI

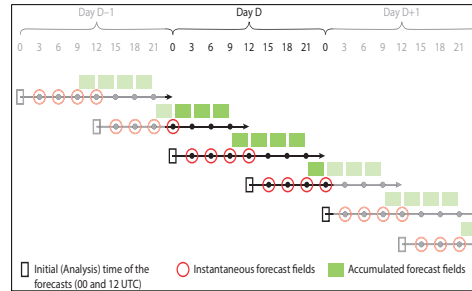
Boussetta et al. (2013)
New satellite-based
Leaf-Area-Index

SOIL Evaporation

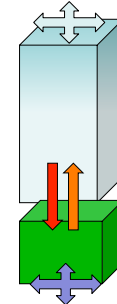
Balsamo et al. (2011).
Albergel et al. (2012)



An improved land surface modeling system including soil snow vegetation and bare soil parameterization revisions



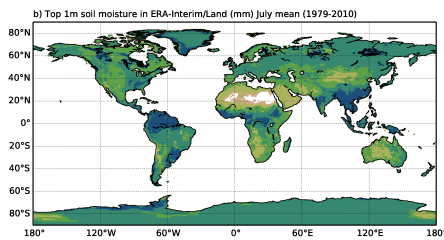
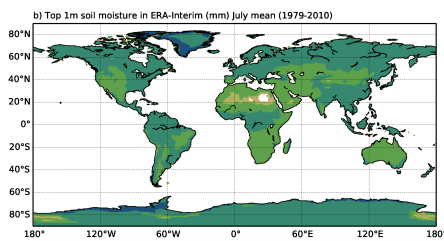
The time series of Meteorological fields obtained by concatenated forecasts extracted from ERA-Interim



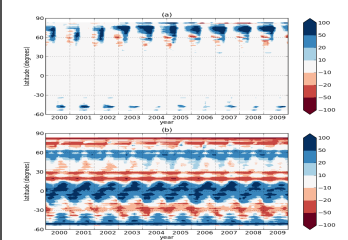
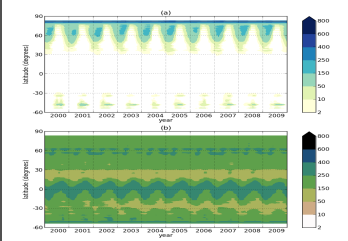
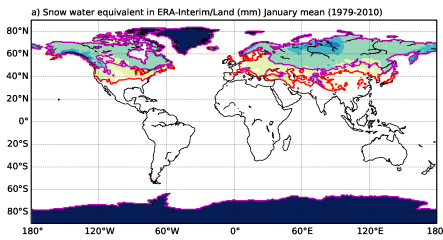
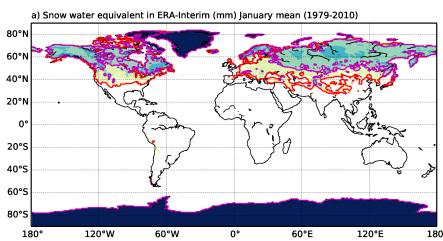
$$(\rho C)D \frac{\partial T_s}{\partial t} = R_n + LE + H + G$$

$$\frac{\partial TWS}{\partial t} = P + E - R$$

An integrated verification of the new land surface reanalysis dataset assessing fluxes and reservoirs

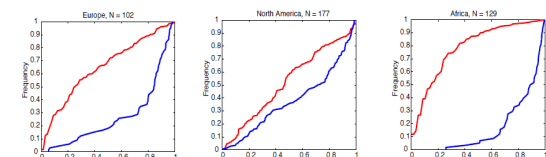


Median of the land water reservoirs in the 1979-2010 period for ERA-Interim (TOP Panels), ERA-Interim/Land (BOTTOM Panels). Snow Water Equivalent (kg/m²) for the 10 to 20 January period, and Top 1m Soil Moisture (kg/m²) for the 10 to 20 July period. The red and magenta contours in figure (a) indicate the 5 and 95 percentile respectively of 10 kg/m² snow water equivalent.

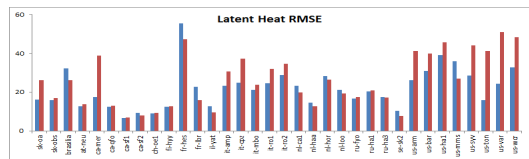


Hovmöller diagram of the land water reservoirs and differences between ERA-Interim and ERA-Interim/Land

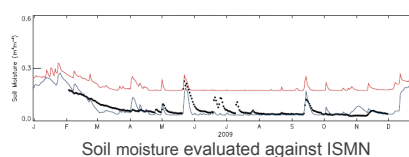
The quality of ERA-Interim/Land is assessed by comparing with ground-based and remote sensing observations. In particular, estimates of soil moisture, snow depth, surface albedo, turbulent latent and sensible fluxes, and river discharges are verified against a large number of site measurements.



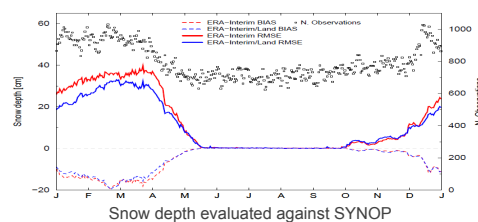
River discharges evaluated against GRDC



Latent heat fluxes evaluated against FLUXNET



Soil moisture evaluated against ISMN



Snow depth evaluated against SYNOP

INFORMATION ON THE DATASET

Global coverage
80 km resolution
3-hourly frequency
From 1979 to 2010

VERIFIED AGAINST IN-SITU OBSERVATIONS

Soil moisture (ISMN Network)
Evaporation (FLUXNET La-Thuile Network)
Snow depth (SYNOP Network)
Snow density (USSR Network)
River discharge (GRDC Network)
Albedo (MODIS Satellite dataset)

DATASET DOWNLOAD

<http://www.ecmwf.int/en/research/climate-reanalysis/era-interim/land>

ERA-Interim/Land provides a global integrated and coherent estimate of soil moisture and snow water equivalent, which can also be used for the initialization of numerical weather prediction and climate models. Future reanalyses at ECMWF will include Land dedicated products following ERA-Interim/Land protocol.

REFERENCE Balsamo, G., Albergel, C., Beljaars, A., Boussetta, S., Brun, E., Cloke, H., Dee, D., Dutra, E., Muñoz-Sabater, J., Pappenberger, F., de Rosnay, P., Stockdale, T., and Vitart, F.: ERA-Interim/Land: a global land surface reanalysis data set, *Hydrol. Earth Syst. Sci.*, **19**, 389–407, doi:10.5194/hess-19-389-2015. 2015.
<http://www.hydrol-earth-syst-sci.net/19/389/2015/hess-19-389-2015.html>