



# Validation of Land Carbon products over the Netherlands

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The Land Carbon Core Information Services (LC-CIS) of Geoland2 aims to setup a preoperational global and regional near real-time infrastructure for data products related to the terrestrial carbon cycle. Surface models, like CTESSEL and ISBA, describing the continental vegetation state (LAI), the carbon and water fluxes and soil moisture, will produce these products for the global and regional scale respectively. Validation results for carbon cycle products from ISBA over the Netherlands are presented.

## 1. Introduction

In the ISBA simulations, atmospheric forcing of 12 to 21 H forecasts from ERA Interim was used. Validation was carried out against in-situ measurements from the FLUXNET sites at CABAUW and LOOBOS.

## 2. Validation

### 2.1 Atmospheric forcing

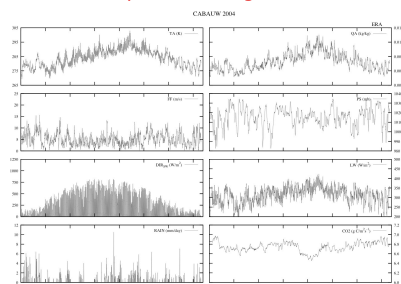


Figure A. Example of 3-hourly ERA Interim forcing.

### 2.2 Carbon fluxes

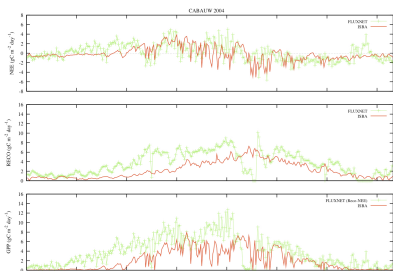


Figure B. Time series of CO<sub>2</sub> fluxes at CABAUW. Simulations are consistent with FLUXNET in-situ observations.

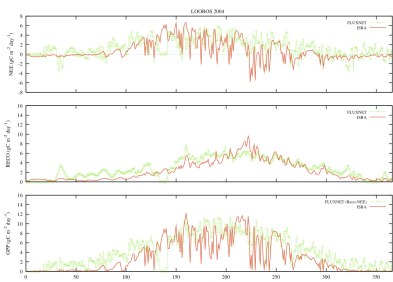


Figure C. CO<sub>2</sub> fluxes at LOOBOS. NEE is consistent with FLUXNET observations.

	GPP		NEE	
corr	0.67	0.78	-0.47	-0.51
stdv	2.45	2.35	2.85	3.60
bias	2.00	1.47	0.08	-2.25

Table A. ISBA scores for carbon fluxes in gCm<sup>-2</sup>/day at CABAUW (blue) and LOOBOS (green) against FLUXNET.

### 2.3 Water fluxes

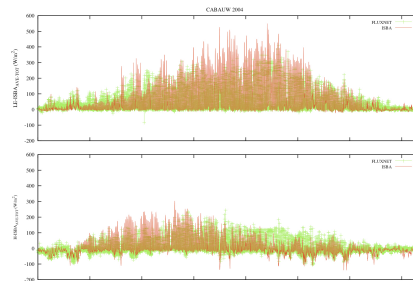


Figure D. Latent heat flux is overestimated in summer and sensible heat flux is underestimated in summer/autumn.

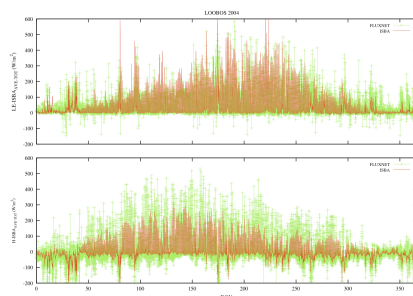


Figure E. Simulation of latent heat flux is adequate. Sensible heat flux is underestimated.

### 2.4 Soil moisture

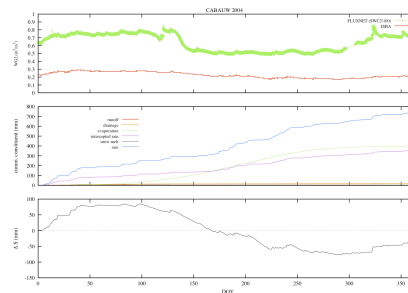


Figure F. Soil moisture is underestimated due to the presence of a regulated water table. The ISBA water balance is ok.

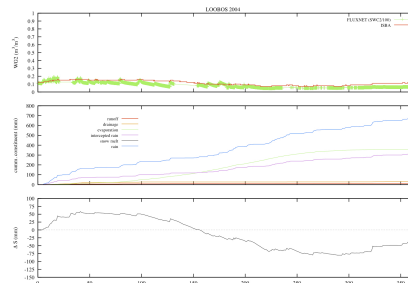


Figure G. Soil moisture simulation is realistic. Water balance of ISBA is adequate.

## 3. Outlook

The ISBA Soil moisture product will be validated with the Soil Wetness Index from ASCAT. The ISBA LAI product will be validated against the BIOPAR LAI product. Multi-annual validation is planned.

### Acknowledgement

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