

# Comparison and quality assessment of five different methods for the estimation of PAR from satellite imagery – Application to the monitoring of soft fruit harvest to maximize farmers' profit in Southern UK

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## Partners



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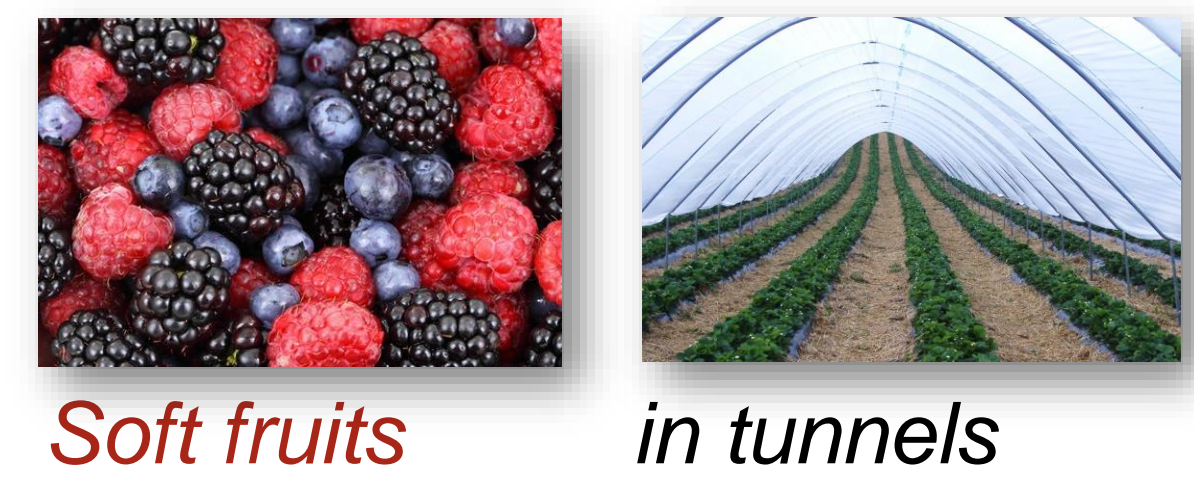
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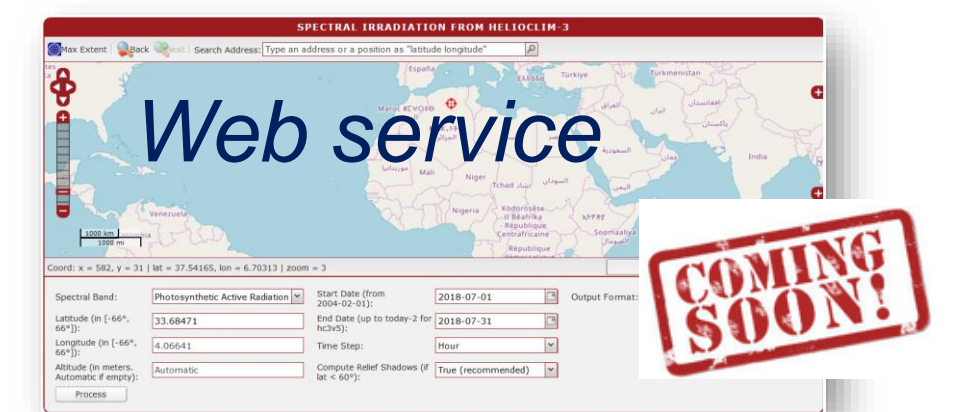
## Introduction - framework

■ This communication deals with the assessment of the **Photosynthetically Active Radiation (PAR)** from satellite images. Five different methods are applied to Meteosat images over Europe and their results are compared to PAR measurements performed at terrestrial stations. This co-designed precursor of an operational application focuses on the delivery of time series and maps of PAR for the monitoring of soft fruit cultures in plastic tunnels in the Southern United-Kingdom.

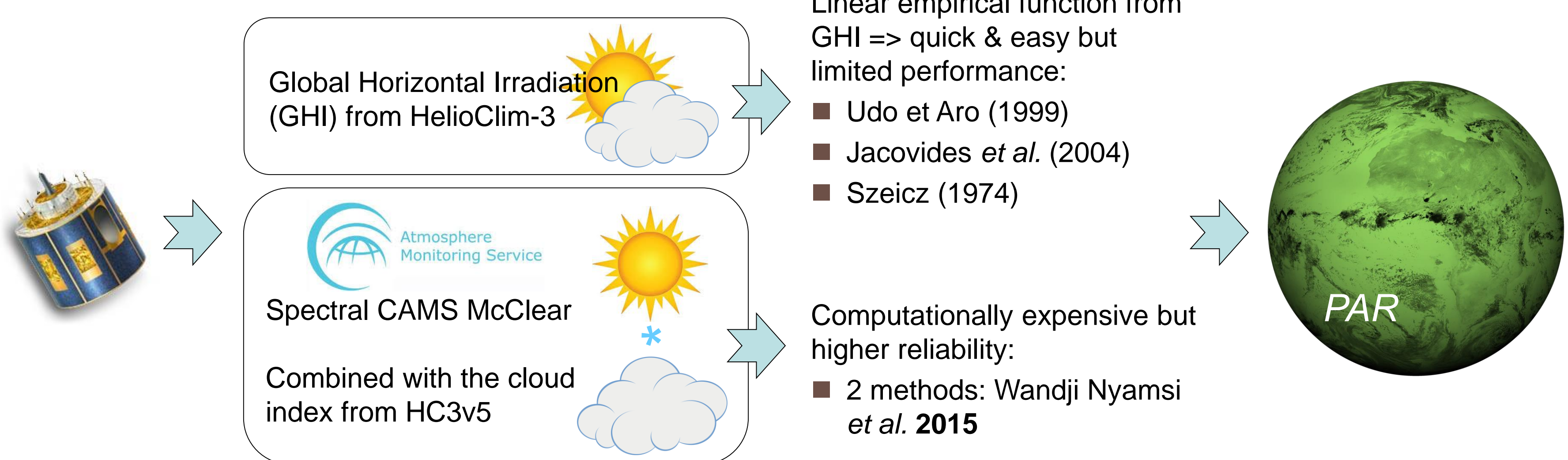
■ Most promising service will be available on   
<http://www.soda-pro.com/web-services/radiation/spectral-from-helioclim-3>



Soft fruits in tunnels



## 5 methods to derive PAR



## Validation with 7 stations in UK

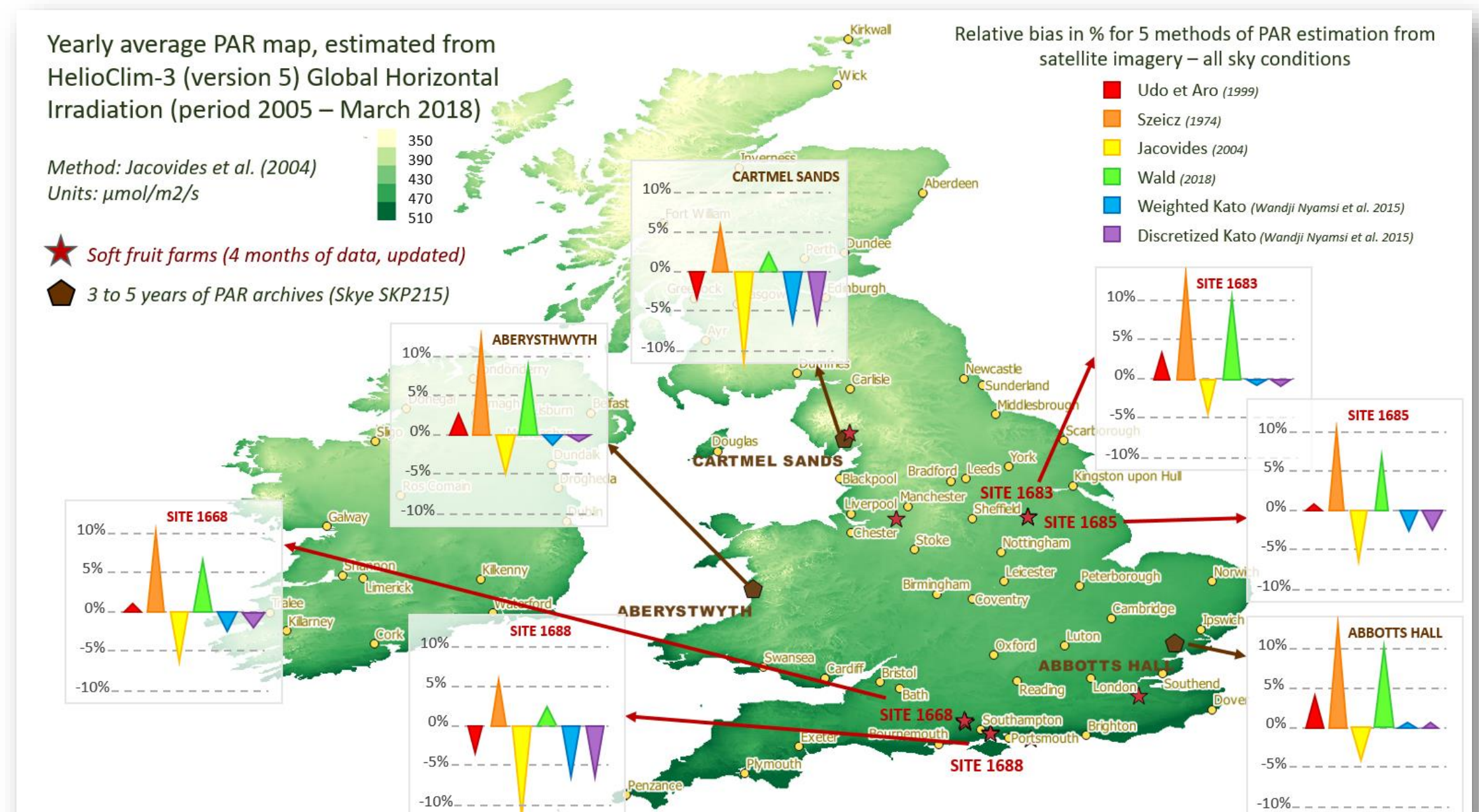
- 3 stations with 3 to 5 years of 30 min data
- 4 stations directly installed in soft fruit farms, start of data collection in April 2018, updated every month
- QUALITY CHECK of the measurements (visual and automatic inspection, discard outliers)
- COMPUTE: relative mean bias MBE, relative standard deviation STDE, relative RMSE and correlation coefficient (CC).

## Results

- Large panel of MBE => see map
- Relative RMSE ranges from 28 % to 32 % for all sites and all methods
- CC ranges from 0,945 to 0,958

## Interpretation

- Low RMSE and high CC for all methods => all approaches succeed in reproducing the in-situ PAR variability
- High performance of both methods of Wandji (2015) methods



NB: CARTMEL SANDS and SITE 1688 exhibit almost identical MBE distribution for all methods, which is very different from other results => suspect a problem of albedo for both sites due to their proximity to sea shores

## Conclusions

As Wandji 2015 methods are computationally expensive and because bias can be easily cancelled, we will opt for an adjustment of the Udo method to make an operational service delivering PAR data over UK via SoDa

## Perspectives

- Extension of this analysis to France, Spain, Greece and Kenya
- Extension of this analysis to Ultra-Violet range and to the spectral answer of different Photovoltaic panel technologies

