

How green is my planet?

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Scientists from Bournemouth University and the University of Southampton have devised a new method of examining how much of the earth's surface is covered by vegetation and assessing the state of health of the foliage. The European Space Agency (ESA) has recognised the value of this information which is likely to be a vital tool for researchers examining models of terrestrial productivity, gas exchange and climate change.

Dr Jadunandan Dash from the School of Geography and Visiting Professor Paul Curran of Bournemouth University use data from an instrument called Medium Resolution Imaging Spectrometer (MERIS) on board the world's largest environmental satellite, Envisat.

It measures reflected radiation in visible red and near-infra red wavelengths. This information, in turn, is used in a tool called the MERIS Terrestrial Chlorophyll Index (MTCI), which has been an ESA operational product since 2004.

"This product enables us to hold a mirror up to our planet and observe, on a regular basis, just how healthy it really is," said Professor Paul Curran.

Images taken in March and August clearly show differences in chlorophyll content between the northern and southern hemispheres. In both maps, the tropical rainforests had relatively high MTCI levels, but even in the centre of these forests there is a change in values between March and August.

These global composite images are being produced weekly and monthly by the UK Multi-Mission Product Archive Facility (UK-MMPAF) and are the only available terrestrial chlorophyll products from space.

MTCI combines information on the extent of the planet's green areas along with an assessment of the amount of chlorophyll in the leaves to produce detailed images of chlorophyll content per hectare or other unit area.

Chlorophyll is the molecule in plants which turns leaves green and absorbs sunlight, using its energy to synthesize carbohydrates from carbon dioxide and water. Oxygen is also produced in this process. The amount of chlorophyll in plants plays an important role in determining

how healthy they are. The MTCI global composites can be used to estimate relative and land cover and specific chlorophyll content in space and time.

Source: University of Bournemouth

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