

Better climate predictions within grasp

April 14 2014

that will improve our understanding of the consequences of climate change and could save the global economy up to \$30 trillion - has received funding to develop a more detailed design of the technology and identify partners. It is hoped the satellite could be in orbit in 3-5 years.

The proposed TRUTHS (Traceable Radiometry Underpinning Terrestrial- and Helio- Studies) mission would see a satellite launched which can make very high accuracy measurements of key indicators of climate change to test and constrain the forecasts of climate models- providing the unequivocal evidence to oblige global consensus action on adoption of appropriate mitigation strategies. The project is being lead by the National Physical Laboratory.

The satellite would have a factor of ten better accuracy than current satellites, and also be able to calibrate and upgrade the performance of other Earth Observation satellites in space. This would significantly improve our understanding of climate change. It would also improve the quality and value of information from Earth observation data in general, leading to improved weather forecasting, food production and monitoring the health of forests- natural sinks of carbon.

The TRUTHS proposal (and its US sister CLARREO) has been around for some time but a relatively high price tag meant it previously struggled to secure funding. Thanks to a new approach developed over the past year, and technological advances, it was possible to reduce the complexity of the TRUTHS mission whilst still achieving the accuracy

of data needed.

Recognising its importance, the UK's space agency through its Centre for Earth Observation Instrumentation and Space Technology (CEOI-ST) has stepped in to support the project. Having funded the updated approach to the mission, it has now announced additional funding to develop a more detailed design of the instrumentation- allowing more accurate costing and help to identify international partners to form a potential bilateral mission.

Greater accuracy is necessary for climate model forecasts to be trusted. The predicted degree of global warming is based on how models treat factors such as cloud cover and height, aerosols and water vapour in the air. This requires detection of very small trends – eg a 1% change in high cloud cover per decade which using current instruments would take at least 30 years. The TRUTHS mission would reduce the time to get a clear picture of the impact of climate change to nearly one third (~12 yrs). Background noise from natural variability makes measurements over periods shorter than 12 years unreliable, even if we could measure with greater accuracy. So TRUTHS represents the best climate monitoring we can ever achieve.

An economic study in 2013 suggests the improved confidence in the evidence from such a mission could mean a global economic saving of \$5 to \$30 trillion in averted damages through better mitigation and adaptation policies which reflect the realities of climate change[1]. The urgency is reinforced by an international report 'strategy towards an architecture for climate monitoring from space'[2] which, has the TRUTHS mission at its heart.

A secondary objective of the mission would enable better monitoring of the health of crops and forests, which would help to mitigate and adapt to the impacts of climate change and reduce world food shortages, whilst

supporting sustained commercial growth, underpinning investments in future carbon markets and providing risk management for the insurance and energy sectors.

Dr Nigel Fox, Head of Earth Observation and Climate at NPL, who is leading the project said: "The recent IPCC findings make scary reading. But whilst we are pretty certain about man-made climate change, we don't really know what the effects will be or how quickly they will happen. If governments are to make decisions significantly constraining carbon emissions or major investments like spending money on a new Thames Barrier or relocating entire populations, we need to be pretty sure we are doing the right thing at the right time. Until we know this, it will be all too easy for governments to procrastinate until it's too late."

"As climate predictions look increasingly frightening, the world is waking up to the need to know exactly what will happen so we can plan and respond properly. In addition to the next stage of funding from CEOI-ST, the Chinese Government have started to seriously look at building a satellite using the concepts developed for the TRUTHS proposal. All being well, TRUTHS – or something like it - could be in orbit within 3-5 years and we can finally move from what the impact of [climate change](#) might be to what it will be".

More information: [1] Value of information for climate observing systems, Environment Systems and Decisions, R.Cooke, July 2013

[2] Strategy towards an architecture for climate monitoring from space, www.wmo.int/pages/.../ARCH_str...chitecture-space.pdf (pg 20) M. Dowell et al, 2013

Provided by National Physical Laboratory

Citation: Better climate predictions within grasp (2014, April 14) retrieved 19 April 2024 from <https://phys.org/news/2014-04-climate-grasp.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.