SUNRISE: Theme 1 Hydro-Climate Services

WP1.1: Real-time soil moisture monitoring

Jon Evans, Ross Morrison, Dan Rylett, Lucy Ball & Alan Jenkins

With many Indian collaborators
Aims of WP1.1 Real-time Soil Moisture Monitoring

- Collaborative development of COSMOS-India network of cosmic ray neutron soil moisture sensors.
  - large area measurement, 12 ha, *in situ* non-contact near-surface (0 to 40 cm) real-time monitoring.

- Development of national COSMOS data system and Real-time soil moisture portal.

- Integration with EO soil moisture products to map validated soil moisture across India.
Acknowledgement: Hollie Cooper, CEH.
Standalone COSMOS-India sites

Singanallur, Alfisol
Sept 2015

Madahalli, Alfisol
(Sept 2015) Feb 2016

IITM Pune, Vertisol
Feb 2017
COSMOS & INCOMPASS flux towers

Berambadi, Alfisol
Feb 2015 (Jan 2017)

IIT Kanpur, Fluvisol
Feb 2016

UAS Dharwad, Vertisol
Jan 2017
COSMOS-India: South Karnataka
COSMOS calibration
Results: South Karnataka sites
COSMOS Installation: UAS Dharwad
COSMOS-India: IIT Kanpur
Results: IIT Kanpur
Next: Henval Valley
Henval Valley, Lesser Himalayas - NIH

- Installed & soil sampling for calibration completed Saturday 17th June 2017
- Site selection by CEH and NIH, Roorkee done March 2015.
WP1.1 Work Plan for 2017-18

• Focus on Standard Operating Procedure across all COSMOS-India sites – harmonisation of real time telemetered data.
• Database, processing, QC & website visualisation to be done by Indian partners (IITM, Pune?), with CEH guidance.

• Feasibility Study to decide best satellite, model, & COSMOS SM product availability for India - which combinations give best value?
• Visiting scientist from India to CEH to work on above.
• Further publications…

HyCRISTAL New Climate Observations
Jonathan Evans and Ben Winterbourn
Contact: JGE@ceh.ac.uk
HyCRIStal Flux Towers

(a) Use sites on commercial farms in Kenya with strong collaboration and mutual goals of sustainable livelihoods.

(b) Work also supported by KMD

(c) Possibly a third site at Kipsitet (TBC)
HyCRIStal Flux Towers, Kenya

(a) Use sites on commercial farms in Kenya with strong collaboration and mutual goals of sustainable livelihoods.

(b) Work also supported by KMD

(c) Possibly a third site at Kipsitet (TBC)

Proposed Flux Towers in Kenya

Kipsitet, grassland

Kericho, tea

Naivasha, Natural scrub, Leleshwa (Camphor)

50 km
Kericho Tea Site, adjacent airstrip
Hell’s Gate, Naivasha – Leleshwa Scrub
• STFC Newton Agritech COSMOS-China with Lincoln University
• Autonomous robotic platform for environmental measurements such as the COSMOS Rover for SM mapping
Thank you.

...Questions?