



Higher Resolution SRTM Data & Flood Modelling Workshop

REPORT

23-27 March 2015

Hosted by: The South African National Space Agency (SANSA)

Location: SANSA Space Operations, Hartbeesthoek, Gauteng, South Africa

Presented by: The CEOS Working Group on Capacity Building & Data Democracy (WGCapD)



The Committee on Earth Observation Satellites' Working Group on Capacity Building and Data Democracy (CEOS WGCapD) continued its series of Digital Elevation Model (DEM) Workshops with the "Higher Resolution SRTM Data & Flood Modelling Workshop" at SANSA Space Operations, South Africa on 23-27 April 2015.

The purpose of this workshop series is to build capacity in utilization of satellite-derived digital elevation data, especially the Shuttle Radar Topography Mission (SRTM) 1-Arc Second data (a.k.a. SRTM 30m or SRTM-2). Additionally, each workshop has a particular application focus. This was the first workshop since the US government's phased global release of the SRTM-30 meter data began in September of 2014.

The workshop was a joint effort amongst the following partners:

- Committee on Earth Observation Satellites (CEOS) WGCapD – primary organizer
- Group on Earth Observations (GEO) - funder
- Instituto Nacional de Pesquisas Espaciais (INPE, Brazil)
- National Aeronautics and Space Administration (NASA, USA)
- National Oceanic and Atmospheric Administration (NOAA, USA)
- Regional Centre for Mapping of Resources for Development (RCMRD)
- Regional Visualization and Monitoring System (SERVIR)
- Secure World Foundation (SWF) - funder
- South African National Space Agency (SANSa, South Africa) - host
- U.N. Office for Outer Space Affairs (UNOOSA) - funder
- U.S. Geological Survey (USGS, USA)

The workshop's application focus was flood modeling. Instruction in two flood models bookended the workshop agenda: TerraHidro, developed by INPE, and CREST, developed by the University of Oklahoma and SERVIR. The final agenda can be found in Appendix A of this report.

Like the previous workshop which had a regional focus on East Africa, the SANSa-hosted workshop also had a regional focus: the Southern Africa region (as defined by the African Union, with Madagascar allowed as an addition due to recent severe flooding). There were 25 workshop participants from the following countries:

- Botswana
- Lesotho
- Madagascar
- South Africa
- Swaziland
- Zimbabwe

There were also invitees from other Southern Africa countries. Support for travel and accommodation was provided to 17 non-South African participants. A detailed list of the participants can be found in Appendix B.



Participants listening to a lecture.

On the last day of the workshop, the participants were required to provide feedback by completing an evaluation form. Below is a summary of the feedback, as well as from workshop organizers and presenters. The lessons learnt from this workshop should be considered to improve the next workshops in the series.

Strengths:

1. Practical

Most participants listed “hands on” or “practical” as a strength, suggesting that they appreciated that the lectures went beyond theory, and that the practical components were relevant and will be useful to their jobs.

2. Focus on Models

Instruction in flood modeling was identified by many as a strength of the course. One participant articulated this point by praising a “new tool for saving life.” The two major models were given a day and a half of instruction each. Due to the overwhelming response, it’s recommended that still more time is allocated to this section in future workshops.

3. Free Open Data and Software

TerraHidro and CREST are both open source models, appropriate for participants from developing countries that generally lack resources to purchase proprietary software.

4. Informing Participants of Freely Available Data

Presenters demonstrated to the participants how to access free and open data from USGS’ Earth-Explorer, NASA’s LPDAAC and SANSA online data catalogues. In addition, the African coverage of the SRTM 30m DEM was provided to the participants in USB flash drives, along with other resources.

5. Clear Instruction

Both primary instructors were rated high by participants. On a scale of 1 -5, with “1” being “unsatisfactory” and “5” being “excellent”, the overall rating for the course was “4.1”. The TerraHidro instructor’s rating was “4.3”, while the CREST instructor was rated “4.2”. The course materials rating was “3.9”. These outcomes were based on 22 evaluation forms received.

6. Local Partner

It was absolutely necessary to have a local partner/host with the ability to organize on-the-ground support and resources for managing all aspects, and existing relationships in the region. It really would not have been possible without SANSA’s support, resources, expertise, and connections. The host should also be a resource for representing what is needed by the end user community in the region.

7. WGCapD Rep/Facilitator

It was beneficial to have a dedicated WGCapD representative on the ground to facilitate the process, present on behalf of the Working Group, and give introductory presentations not covered by the expert presenters.

8. Technically-trained Participants

Part of the success of the workshop was due to the group of technical participants. It enabled a higher level of training and discussion than if we had policy- or management-type participants.

9. Take Home Materials

In addition to the SRTM 30m DEM, INPE and RCMRD also contributed to the take home materials given to the participants by providing presentations and software.

10. Closing Ceremony

On the last day of the workshop, the participants were taken on a tour of SANSAs Space Operations Centre, not far from the workshop venue. A ceremony of presenting the participants with certificates followed. This was a moment to celebrate not only the participants' completion of the workshop but also to acknowledge the contributions of individuals and organizations that contributed to its success.

Suggestions for Improvement:

1. Stricter screening of students

A few participants who lacked GIS skills slowed down the training for the rest. In the future it is recommended that the recruitment criteria better identify candidates which have the prerequisite knowledge of the training to be conducted.

2. Assistants for instructors

While SANSAs staff and other workshop facilitators were sometimes available to help the participants who fell behind in the training, the assistant trainers were not always in the room and had difficulty catching up. It's recommended that the course coordinators and any assistants meet before the training to familiarize each other before the course with training materials.

3. Increase number of days of training

This recommendation, while unlikely to be implemented in future workshops, indicates the belief by some participants that there was a lot of material being covered for a short period. Other presentations could possibly be reduced to make more time for the modeling.

4. Preload software

The hydrological models taught by the instructors first had to be installed onto SANSAs-sponsored training laptops. While on the one hand, the participants learned some peculiarities about the software that they would not have otherwise, on balance this time would have been better spent on more practical exercises.

5. Add more exercises

For both TerraHidro and CREST, some time that was scheduled for exercises was eaten up by troubleshooting and discussion. The exercises are probably the most valuable sessions since they reinforce what has been learned up until that point and validate their utility to the user.

6. Individually crafted exercises

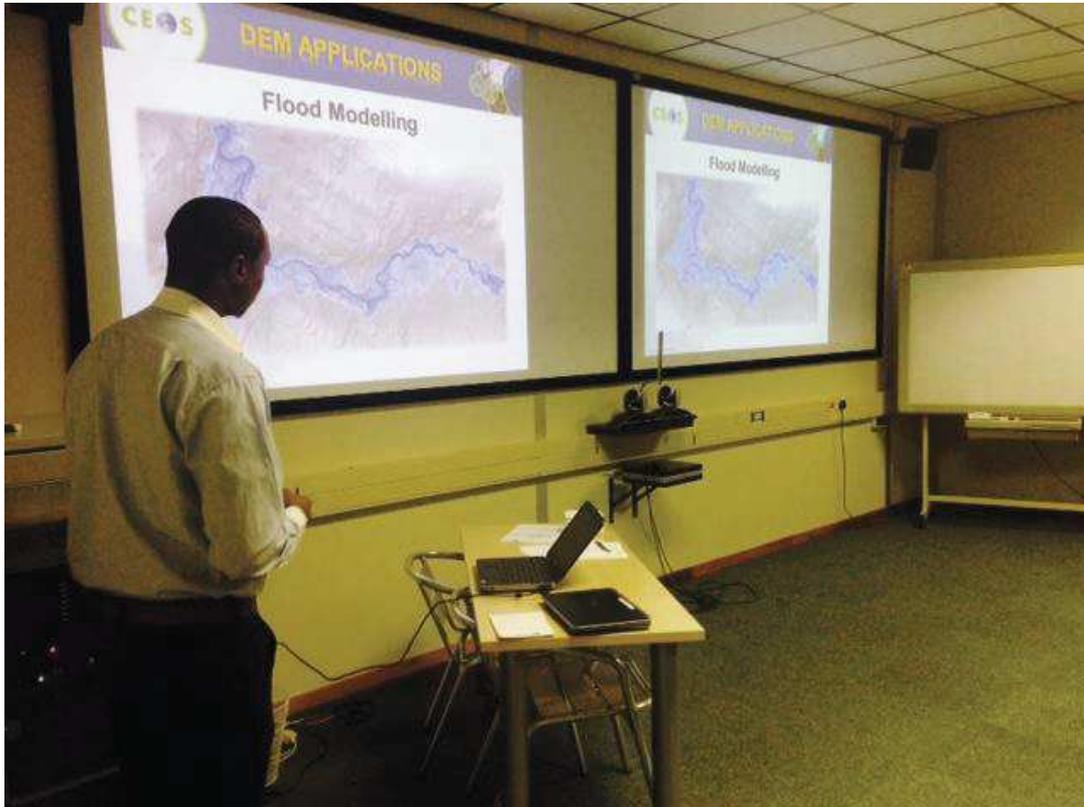
It was useful to focus on a single region or case study for the hands-on exercises. It provided continuity through the diverse range of training topics and modules. If students are encouraged to bring relevant data of their country with them to the exercise, they could practice an exercise using data that is already familiar and pertinent to them.

7. Preparation Time

The earlier we can prepare for such an activity, the easier it is to manage the event without an inordinate amount of urgent tasks. This applies to invitations, logistics, preparation of materials, etc. While in this case, there was sufficient coordination between presenters to avoid redundancy, ideally, course materials would be handed out at the beginning of the week for participants to be able to refer to as a topic comes up.

8. Perform online

Obviously the number of participants was limited by space and cost constraints. Holding a similar course online would allow it to reach a wider audience.



Mr. Phila Sibandze demonstrating flood inundation

Appendix 1: Workshop Agenda

Day One: Monday, 23 March 2015

Item #	Time	Activity	Presented By
0	09.30-10.00	Arrival of Participants and Registration	SANSA
1	10.00-10.15	Welcoming Remarks	SANSA – Dr. Jane Olwoch
2	10.15-10.45	Intro to Digital Elevation Models	SANSA – Phila Sibandze
	10.45-11.00	Break	
3	11.00-11.30	Intro to UN-SPIDER & Importance of DEMs to Disaster Management	UNOOSA – Lorant Czarán
4	11.30-12.00	Intro to TerraMA	INPE – Dr. Laercio Namikawa
	12.00-1.00	Lunch	
5	13.00-14.30	TerraHIDRO – Intro / Theoretical Concepts	INPE – Dr. Laercio Namikawa
	14.30-14.45	Break	
6	14.45-16.15	TerraHIDRO – Tools and Usage Examples	INPE – Dr. Laercio Namikawa

Day Two: Tuesday, 24 March 2015

Item #	Time	Activity	Presented By
7	09.00-10.30	TerraHIDRO – Guided Exercises	INPE – Dr. Laercio Namikawa
	10.30-10.45	Break	
7	10.45-12.00	TerraHIDRO – Guided Exercises	INPE – Dr. Laercio Namikawa
	12.00-13.00	Lunch	
8	13.00-15.30	TerraHIDRO – Self-led Exercises	INPE – Dr. Laercio Namikawa
	14.30-14.45	Break	

8	14.45–16.15	TerraHIDRO – Self-led Exercise	INPE – Dr. Laercio Namikawa
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Day Three: Wednesday, 25 March 2015

Item #	Time	Activity	Presented By
9	09.00–09.30	Intro to CEOS	NOAA – Patrick O’Brien
10	9.30–10.30	SRTM Overview	NOAA – Patrick O’Brien
	10.30–10.45	Break	
10	10.45–12.00	SRTM Versions and Access	USGS – Dr. Eric Wood
	12.00–13.00	Lunch	
11	13.00–14.30	GeoSUR – Exercise	USGS – Dr. Eric Wood
	14.30–14.45	Break	
12	14.45–16.15	RCMRD Overview	RCMRD – Faith Mitheu

Day Four: Thursday, 26 March 2015

Item #	Time	Activity	Presented By
13	09.00– 10.00	Intro to CREST Model-Concepts	RCMRD – Faith Mitheu
		Application at local/regional/global scale	SANSA – Phila Sibandze
14	10.00–10.30	CREST data requirements and sources	RCMRD – Faith Mitheu
	10.30–10.45	Break	
15	10.45–11.15	CREST organization of folders and files	RCMRD – Faith Mitheu
		Run model with example basin & preloaded data	
		Hydrographs visualization in Excel	

16	11.15–12.15	CREST manual calibration	RCMRD – Faith Mitheu
		CREST automatic calibration	
	12.15–13.15	Lunch	
17	13.15–14.30	CREST Guided Exercise 1	RCMRD – Faith Mitheu SANSa – Phila Sibandze
	14.30–14.45	Break	
18	14.45–16.15	CREST Guided Exercise 2	RCMRD – Faith Mitheu SANSa – Phila Sibandze

Day Five: Friday, 27 March 2015

Item #	Time	Activity	Presented By
19	09.00–09.30	CREST Self-led exercise 1	RCMRD – Faith Mitheu SANSa – Phila Sibandze
20	09.30–10.15	CREST Self-led exercise 2	RCMRD – Faith Mitheu SANSa – Phila Sibandze
	10.15–10.30	Break	
21	10.30–11.00	Use prepared data under self-led exercise 1	RCMRD – Faith Mitheu SANSa – Phila Sibandze
22	11.00– 12.00	Web version GFT demonstrations	RCMRD – Faith Mitheu
	12.00–13.00	Lunch Break	
22	13.00–13.45	Continue GFT demonstrations, CREST wrap-up	RCMRD – Faith Mitheu
23	13.45–14.30	Feedback from Participants	NOAA – Patrick O’Brien
24	14.30–14.45	Workshop Closure and Handing Out Certificates	NOAA – Patrick O’Brien