Variable Infiltration Capacity (VIC) &
Bias Correction of Satellite Precipitation Data
Training Agenda

Hosted at the Regional Centre for Mapping of Resources for Development (RCMRD)

Nairobi, Kenya – 6 - 10 March 2017

Training Objectives:

The specific objectives of the workshop are to:
1. Provide an overview on the background and physics of the Variable Infiltration Capacity (VIC) model;
2. Train participants on how to setup and their own VIC model for hydrologic extreme monitoring, climate/land cover change impact, and hydrocrop modeling applications;
3. Highlight research applications of the VIC model and discuss VIC's development roadmap;
4. Provide an overview and examples of two commonly used bias correction methods for localized correction of satellite precipitation data; and
5. Train participants on how to use the open source code to implement both bias correction methods

Expected Outcomes:

By the end of the training, participants will:
1. Have an understanding of the VIC model structure and model physics;
2. Be able to set up a VIC model for their own domain and hydrologic extreme monitoring, climate/land cover change impact, and hydrocrop modeling applications; and
3. Have an understanding of hydrologic modeling applications and VIC developments through GitHub.
4. Use the open source scripts to regionally bias correct satellight precipitation data for an area of interest

Prerequisites:

1. Background in hydrology/hydrologic modeling,
2. Basic experience with Linux and command line operations,
3. Basic understanding of Python scripting, and
4. Ideas for hydrologic modeling applications and collaboration

Materials:

1. Participants may bring their own laptops (with at least 4 GB of RAM and 25 GB of storage space). A virtual machine will be provided before the workshop for participants to install on their own laptops. Computers will also be available should the participants need.
2. All training materials including presentations, manuals, sample datasets, and scripts, will be posted online (e.g., servirglobal.net, or GitHub) for future use/reference.

Agenda:

Day 1: VIC Overview

Time:	Activity:
9:00 AM – 9:30 AM	Welcome address and introductions
9:30 AM – 10:30 AM	Hub presentations
10:30 AM – 10:45 AM	Break
10:45 AM – 12:15 PM	VIC Overview (Model physics, assumptions, inputs and additional features)
12:15 PM – 12:30 PM	Group Picture
12:30 PM – 2:00 PM	Lunch
2:00 PM – 3:00 PM	VIC installation/running the model
3:00 PM – 3:15 PM	Break
3:15 PM – 4:45 PM	VIC application on small watershed
4:45 PM – 5:00 PM	Summary of the day

Day 2: VIC Model Run in the Nyando Basin

Time:	Activity:
9:00 AM – 10:30 AM	Nyando Basin model set up (Soil and vegetation parameters)
10:30 AM – 10:45 AM	Break
11:00 AM – 12:30 AM	Nyando Basin model set up (Vegetation library and meteorological forcing files, global parameters, running the model, and formatting outputs)
12:30 PM – 2:00 PM	Lunch
2:00 PM –3:00 PM	Nyando Basin model setup (routing inputs and running the routing model)
3:00 PM – 3:15 PM	Break
3:15 PM – 4:45 PM	Nyando Basin model setup (Validation, final outputs and visualization of data)
4:45 PM – 5:00 PM	Summary of the day

Day 3: VIC Special Topics

Time:	Activity:
9:00 AM – 10:45 AM	VIC Applications (Hydro-crop model coupling)
10:45 AM – 11:00 AM	Break
11:00 AM – 12:00 PM	VIC Applications (Climate/land cover change impacts)
12:00 PM – 12:30 PM	VIC development / new releases
12:30 PM – 2:00 PM	Lunch
2:00 PM – 3:00 PM	Calibrating VIC for hydrologic extreme monitoring
3:00 PM – 3:15 PM	Break
3:15:PM – 4:15 PM	Special or additional topics identified during training
4:15 PM – 5:00 PM	Summary of the VIC training

Day 4: Bias Correction of Satellite Precipitation Data

Time:	Activity:
9:00 AM – 10:15 AM	Introduction and discussion on Satellite Precipitation Products and Bias Correction Methods
10:15 AM – 10:45 AM	Introduction to R/ R Studio
10:45 AM – 11:00 AM	Break
11:00 PM – 12:30 PM	Advanced Techniques in R (Introduction on essential packages for bias correction model)
12:30 PM – 2:00 PM	Lunch
2:00 PM – 3:00 PM	Bias Correction Method 1 Introduction: Linear
3:00 PM – 3:15 PM	Break
3:15:PM – 4:15 PM	Bias Correction Method 1 Exercise
4:15 PM – 5:00 PM	Summary of the Day

Day 5: Bias Correction of Satellite Precipitation Data

Time:	Activity:
9:00 AM – 10:30 AM	Bias Correction Method 2 Introduction: Quantile Mapping
10:30 AM – 10:45 AM	Break
10:45 AM – 12:30 PM	Bias Correction Method 2 Exercise
12:30 PM – 2:00 PM	Lunch
2:00 PM – 3:30 PM	VIC model run using Bias Corrected outputs (half with Linear method and half with QM method)
3:30 PM – 4:00 PM	Closing remarks and issuing of certificates