

Community Based Watershed Research

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Scientist Needs

- Useful datasets
 - Temporal and/or spatial
 - Acquisition of new data
- QAQC
- Standardized data collection
- Data submission, compilation and integration
- Publications essential, particularly for untenured faculty

Other Collaborator Needs

TEACHER/STUDENT

- Curriculum/classroom ready
 - Doable - costs, time, fulfills standards, etc.
- Relevant and engaging for students
- Flexible for types of projects and interests

COMMUNITY

- Include community partner interests and needs
- Products of research potentially useful for management decisions

Watersheds

- ◉ Integrating context for varied research
 - Quality and quantity of water
 - Spread of diseases, e.g., malaria
 - Agriculture

Research Framework: SWAT

- ◉ Soil and Water Assessment Tool
- ◉ River basin, watershed, scale model
- ◉ Developed to predict the impact of land management practices on water, sediment, and agricultural chemical yields
- ◉ Designed for large, complex watersheds with varying soils, land use, and management conditions over long periods of time

[Team](#)[Contact](#)[Links](#)[Search](#)

Soil & Water
Assessment Tool

SWAT

[Software](#) ▾ [Documentation](#) [Publications](#) ▾ [Education](#) [Conferences](#) ▾ [Applications](#) [Support](#) [Jobs](#)

Welcome to the Official SWAT Web Site

SWAT is a river basin scale model developed to quantify the impact of land management practices in large, complex watersheds.

SWAT is a public domain model actively supported by the USDA Agricultural Research Service at the Grassland, Soil and Water Research Laboratory in Temple, Texas, USA.

 [Visit our user groups](#)

 [SWAT fact sheet](#)

 [Disclaimer](#)

SOFTWARE UPDATES

- **ArcSWAT (8/20/2010)**
Version 2009.93.5 for SWAT 2009 and ArcGIS 9.3 SP1
Recommended "Do"s and "Don't"s for ArcGIS and ArcSWAT (9/13)
- **SWATeditor (8/20/2010)**
Version 2009.93.5 for SWAT 2009; Companion to ArcSWAT
- **SWAT2009 available for download**
- **SWAT-CUP**

UPCOMING EVENTS / NEW ITEMS

- | | |
|-----------------|---|
| Jan 04-08, 2011 | 2nd International SWAT-SEA
Ho Chi Minh City, Vietnam |
| Feb 07-11, 2011 | SWAT Workshops, College Station, TX
SWAT for Beginners
Advanced Data Processing for ArcSWAT
SWAT for Advanced Users |
| | 2011 SWAT African Workshop |

<http://swatmodel.tamu.edu/>

Minimum datasets for SWAT

- ◉ Digital Elevation Model (DEM)
- ◉ Land use/land cover (LULC)
- ◉ Soils
- ◉ Meteorological data, especially temperature and precipitation
- ◉ Many connections with GLOBE materials
 - Leverages off existing infrastructure

Example: Nigeria



Meteorological Data

- Data Loggers
 - Variety of air and soil sensors
 - Continuous datasets
 - Graduate students and teachers download data and send via email
- GLOBE students supplement and enhance datasets



Community Involvement and Capacity Building

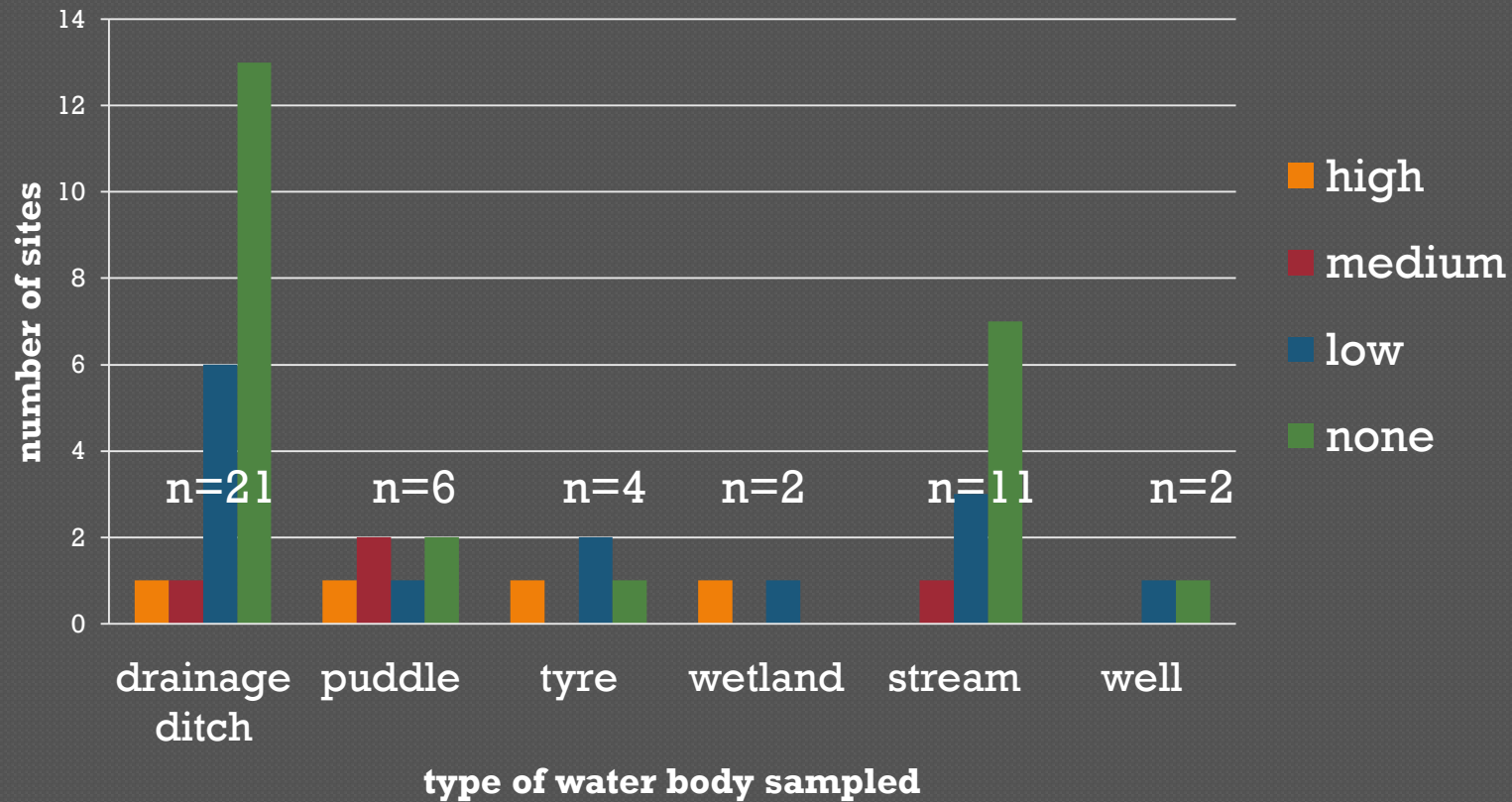
- Teacher Workshops and field campaigns
- Development of new and adaptation of materials for African context
- Student research – flexible approach allows for diverse environmental data collection to be put to use
- Putting GLOBE and other materials into meaningful local/regional context

Osogbo Workshop Format

Day	Activity	Science Process
1	Introduction to materials; learning data collection techniques	Asking questions, making predictions and hypotheses Developing sampling strategy and field logistics
2, 3, 4	Divided into two groups and sampled in urban and rural environments	Data collection
5	Group discussion, graphing and mapping	Data analysis and synthesis, interpretation
6	Student and teacher presentations	Communication of results

Results

Water Body and Larvae Density



Impacts on Teachers

- “Initially before this exercise, I used to have the impression that all these things we are doing in sciences are not practicable... it is not real. Even when I was in secondary school, I used to think that all we are doing is magic... But going through these exercises makes me know and believe that all we are doing is practicable, that we can equally derive an hypothesis, prove it and even put it into law.”

Applications

- Watersheds/water resource needs are everywhere
- Types and data availability varies greatly around the world
- Can be adapted to the needs and research interests of students, teachers, scientists, and communities

Implementation

CLASSROOM

- Varied student research
 - LULC, meteorological, soils, phenology
 - GLOBE and other protocols
- Relevance: water, health and food – develop new or adapt existing
- Cost of classroom equipment varies, but mostly inexpensive
- Data loggers in strategic places

PROFESSIONAL DEVELOPMENT

- Workshops
- Field campaigns
- Online where possible