

# Making QAPPs

# Work for You

## South RIVERKEEPER's Model



**Where the heck did the QAPP stuff come from anyway?**

It all started with the Drug Industry.

Drug industry had none, gave drugs to humans with out testing

Classic case: Thalidomide Babies



Thalidomide  
Babies

Drug was made in 1957 for pregnant women for morning sickness, everywhere in the world. It was not until the 60s that Frances Kelsey, M.D. stood up to the Pharm company and told FDA not to approve to drug. Eventually it was tested and found to be teratogenic.

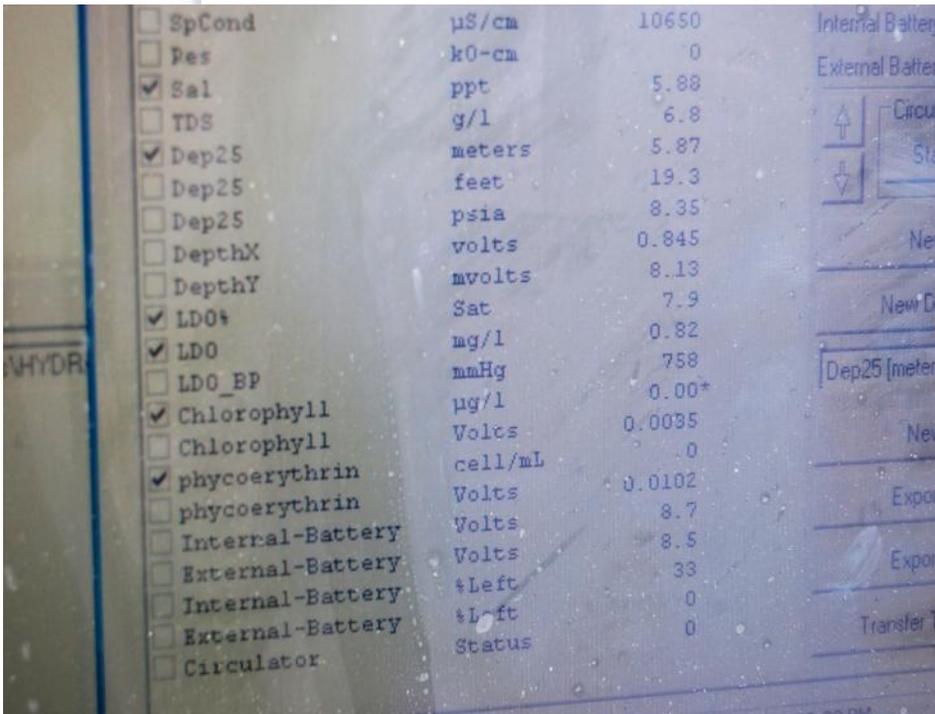
# What is a Quality System and Why Should you care?

A structured and documented management system which has a system in place for ensuring the quality of its work process, products and services.

The QMP describes the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of the organization

*It gives your organization Credibility and Believability.*

*Data that Local, State and Federal agencies can use.*



<input type="checkbox"/> SpCond	µS/cm	10650
<input type="checkbox"/> Per	kΩ-cm	0
<input checked="" type="checkbox"/> Sal	ppt	5.88
<input type="checkbox"/> TDS	g/l	6.8
<input checked="" type="checkbox"/> Dep25	meters	5.87
<input type="checkbox"/> Dep25	feet	19.3
<input type="checkbox"/> Dep25	psia	8.35
<input type="checkbox"/> DepthX	volts	0.845
<input type="checkbox"/> DepthY	mvolts	8.13
<input checked="" type="checkbox"/> LDO+	Sat	7.9
<input checked="" type="checkbox"/> LDO	mg/l	0.82
<input type="checkbox"/> LDO_BP	mmHg	758
<input checked="" type="checkbox"/> Chlorophyll	µg/l	0.00*
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<input type="checkbox"/> Internal-Battery	Volts	8.7
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<input type="checkbox"/> Circulator	Status	0

## Why should I write a QA Project Plan- WHO CARES?



QA Project Plans are required for all EPA projects and tasks involving environmental data operations (generating or using).

Non-EPA organizations wanting to use legally defensible data for litigation should write a QAPP.

**REQUIRED for large scale restoration projects!**

Organizations that write and use a QAPP are taken seriously by governmental organizations.

## Different Types of QA Project Plans

- Task-Specific QA Project Plans: those projects for which the environmental data operation is task, site or project specific.
- Generic or Programmatic QA Project Plans: those projects for environmental data operations conducted at multiple locations and/or over a long period of time.

## Project Specific QAPPs



One of our restoration projects:  
Davidsonville Wildlife Sanctuary  
Before restoration

Restoration Projects; Such As- A Wildlife Sanctuary, before and after  
Monitoring was/is required.

# South RIVERKEEPER's Tiered approach

Project	QAPP	Uses	Persons
Tidal Monitoring	Generic Tidal	Accepted to EPA/MDE/DNR Report Card Peer-Reviewed Publications Technical Report IM Rivers (SRF website)	SRF Staff
Non-Tidal	Generic Non-Tidal	Report Card Peer-Reviewed Pubs Technical Report IM Rivers (SRF website)	SRF Staff/Interns
Non-Tidal	Volunteer QAPP	Volunteer Reports IM Rivers (SRF website)	RiverWatchers
Bacteria	Tidal Bacteria	SwimGuide Report Card on-line Social Media	SRF staff/Interns
SAV	SAV QAPP	Report Card website	SRF Staff/interns



# Headwaters Wetland Restoration



## Keeping Pollution Out of Beard's Creek and the South River

Formerly the site of an algae-filled farm pond with barren banks, we now have a beautiful wetland. The goal of this project was to enhance the Sanctuary property as well as create a series of post-treatment wetlands to clean up the water leaving the site before it gets to Beard's Creek.

The project slows the movement of storm flows through the pond (and restores baseflow) by setting a series of grade controls through its length. The soils around the pond are re-hydrated by raising the height of its outfall and creating a series of terraced wetlands that will trap sediment and process nutrients before water leaves the property. These terraced wetlands are fenced off from the rest of the enclosure to allow vegetative growth and to minimize the fouling of water quality by wildlife.



With the landowner's permission, what was a source of pollution to the river has now been converted into a beautiful, functional best management practice that contributes cool, clean baseflow to Beard's Creek.

The South River Federation is working diligently with local partners, including the Davidsonville Wildlife Sanctuary, to reduce stormwater runoff from entering local creeks and the South River in an effort to improve water quality for the entire ecosystem and to protect human health.



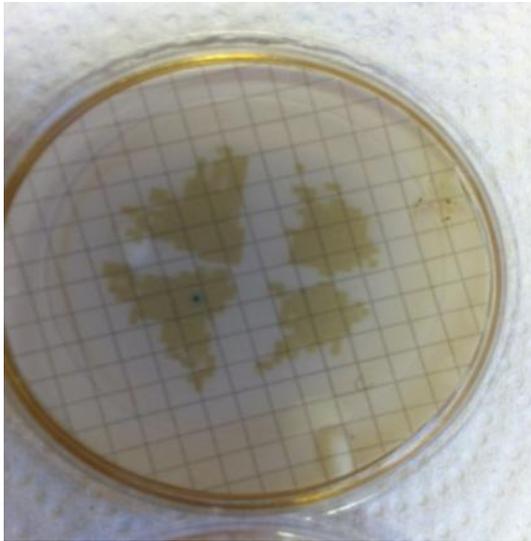
*This project was made possible by grants from the Chesapeake Bay Trust, Constellation Energy, Maryland Department of Natural Resources, and with support from the South River Federation, Davidsonville Wildlife Sanctuary, Sylva Native Nursery, Arlington Echo, and Chesapeake Bay Roasting Company. The project was designed by Underwood & Associates and constructed by Brightwater, Inc.*



In memory of Tyler, Corey, Harrison, & Mike



Why a QAPP: Data Quality important for proof of evidence for nutrient reduction



Bacteria analysis

Nutrient analysis- Nitrate, Nitrite and Orthophosphate

Physico-chemical measurements downstream:

Dissolved Oxygen

Conductivity

Chloride

Temperature

pH

Weekly monitoring 3 years before project and currently after project

# SRF's General Tidal Monitoring QAPP



South River Federation  
Tidal Monitoring Quality Assurance Project Plan  
November 2010, Diana Muller



Quality Assurance Project Plan

For

South River Federation

Water Quality Monitoring Program

Diana Muller, South RIVERKEEPER®

*Diana Muller* 11-8-2010

Erik Michelsen, Executive Director

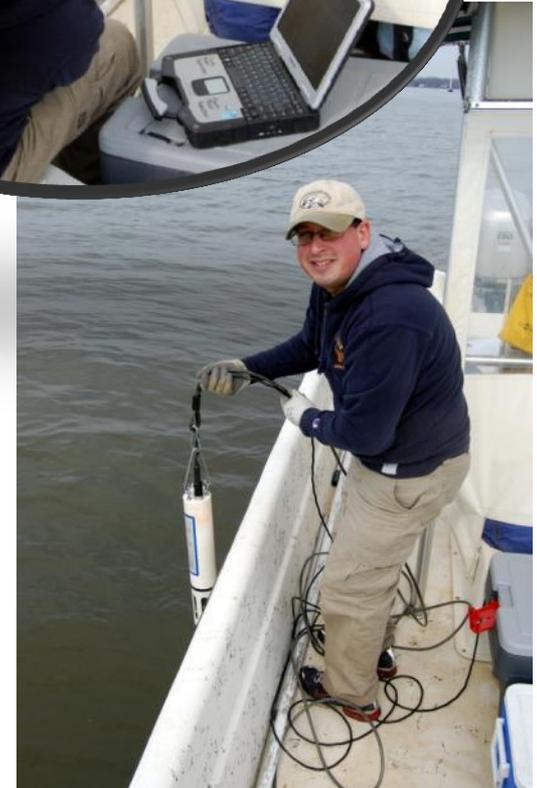
*Erik Michelsen* 11/9/2010

Jennifer Gundersen, Ph.D., QA Data Coordinator

*Jennifer Gundersen*

Andrew C. Muller, Ph.D., QA Officer

*Andrew C. Muller*



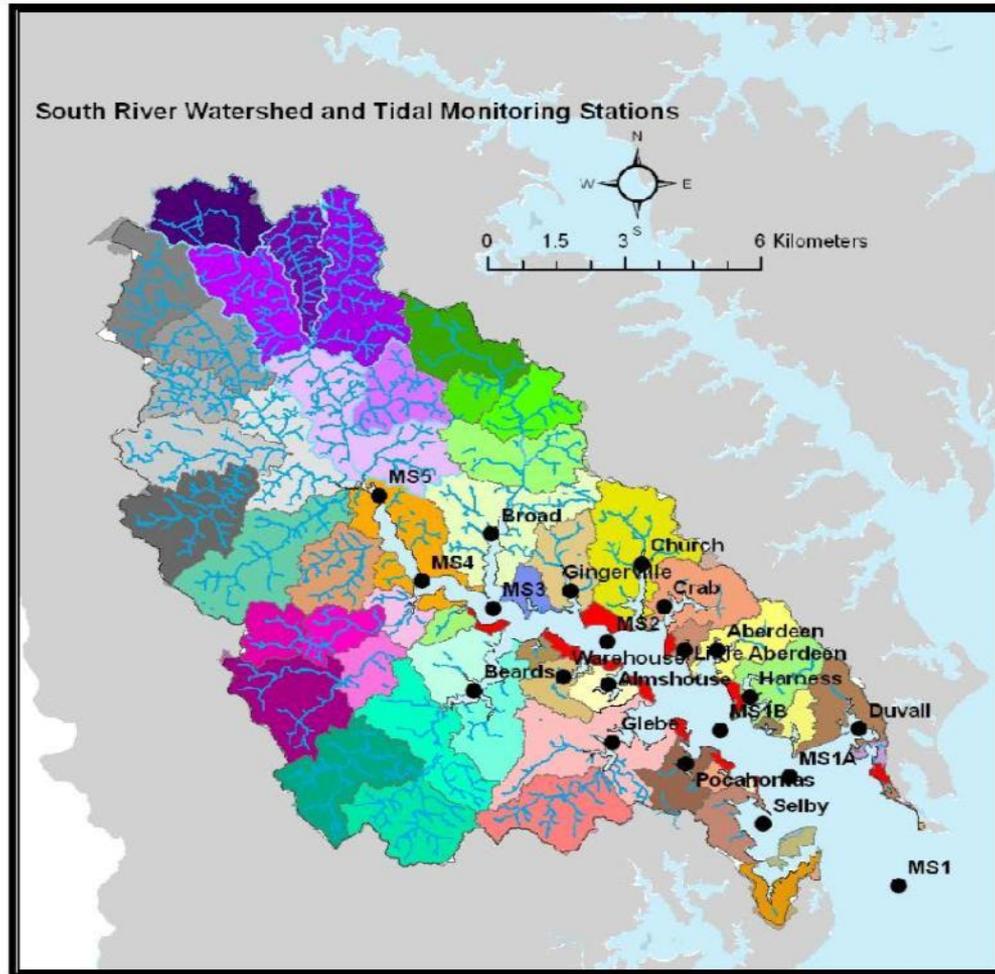


Figure 1; South River Watershed and Monitoring Stations

Before starting a  
Monitoring program  
Decide what and where  
You want to monitor.

In our case, it is a general  
Spatial-temporally  
Designed  
Tidal monitoring program.

Using ArcGis and  
Voxler, we modeled  
The locations to sample.



**We cover 21 Tidal Stations Monitored Weekly,  
or as weather provides**



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EPA has a great document to Write QAPPs EPA QA/R-5

EPA Requirements for Quality Assurance Project Plans



## **B1 Sample Process Design**

### *B1.1 Type and Number of Samples required:*

Sample Type: Estuarine samples from the tidal portion of South River, MD.

Number of Samples: 21 stations on the South River; 7 main stem and 14 tidal creeks.

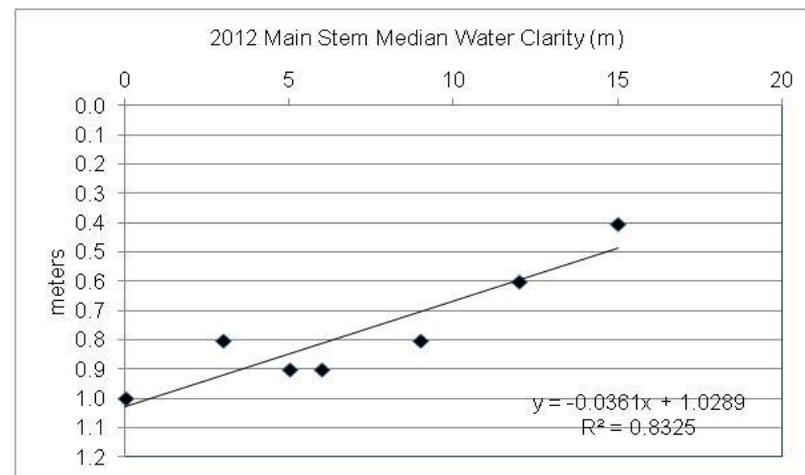
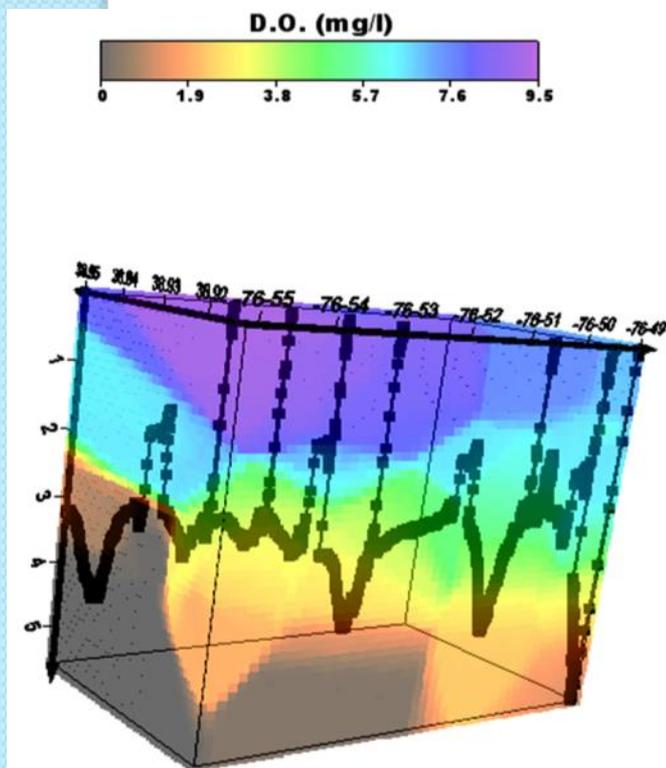
Field QC: For every 10 stations a duplicate vertical profile will be performed directly after the first profile. This will be saved as a duplicate. Further information is in the Tidal Monitoring SOP.

### *B1.2 Sampling design and rationale*

The South River Water Quality Monitoring program was designed statistically and geo-spatially using krigging to provide with a robust data set. The 7 main stem stations provide information on the South River, and the 14 tidal creeks provide information on each specific tidal creek. The tidal creeks sample locations are as far inside the creek the boat can go with still having 2 meters depth or greater. This type of spatial data can be helpful to determine the location of area that could have persistent low dissolved oxygen, extreme temperature, and/or high nutrient loading. This could potentially lead to fish kills and algae blooms, but can also help to determine restoration location and priorities.

# SO MANY PURPOSES WITH THE SAME HIGH QUALITY DATA SET !

## IMPORTANT TO KNOW YOUR WATERBODY



We now know that the South River Estuary's poor water clarity is directly Proportional to "itself"

2012 Dissolved Oxygen over time



QAPPs don't have to be complicated

Project Specific: Small and Simple

Submerged Aquatic Vegetation  
Mapping –

Secchi Disk

YSI Pro Series

GPS

Rack

ID guide

Using ArcGIS, calculate acreage  
Of SAV

## Problems:

*WEATHER!!* Blizzards, Tropical Storms and Hurricanes



*Computers, Access97 was required,  
Had to dig my old computer out of my attic*

*Boat engine break downs*



## My Advice before starting a monitoring program

- 1) What is it you want to monitor?
- 2) Plan and Map it
- 3) What does the agency need?
- 4) It is obtainable (Staff, Fiscal, and Longevity)
- 5) Write your QAPP
- 6) Write your SOPs (standard operating procedures)
- 7) Implement monitoring plan using QAPP
- 8) End of season re-assess your needs

## Iraqi environmentalists learn from Arundel counterpart



How important is a QAPP? Ask the Iraq- they do not have An EPA or any local agencies, but they are using a QAPP to prove To citizens and government how bad the Tigris really is.



WEDNESDAY, 12 JUNE 2013 19:26

By PAMELA WOOD, The Baltimore Sun  
Thousands of miles away in northern [Iraq](#), the Upper Tigris River is fouled by a litany of problems: trash dumped in the river, raw sewage flowing into the water, streams diverted by gravel mining, dams that block fish passage. If the Upper Tigris Riverkeeper, Nwenar Fatih, has any chance at improving the health of the river, he needs solid scientific data. So after attending a Waterkeeper Alliance conference in Georgia over the weekend, Fatih and two colleagues spent Monday on the South River in Anne Arundel County, learning to use a \$12,000 water quality meter.

Fatih joined Diana Muller, riverkeeper for the South River Federation, in dipping a long, cylindrical device called a YSI hydrolab into the water and watching readings for salinity, oxygen, temperature, algae and more pop up on a Pasonic Toughbook laptop computer.

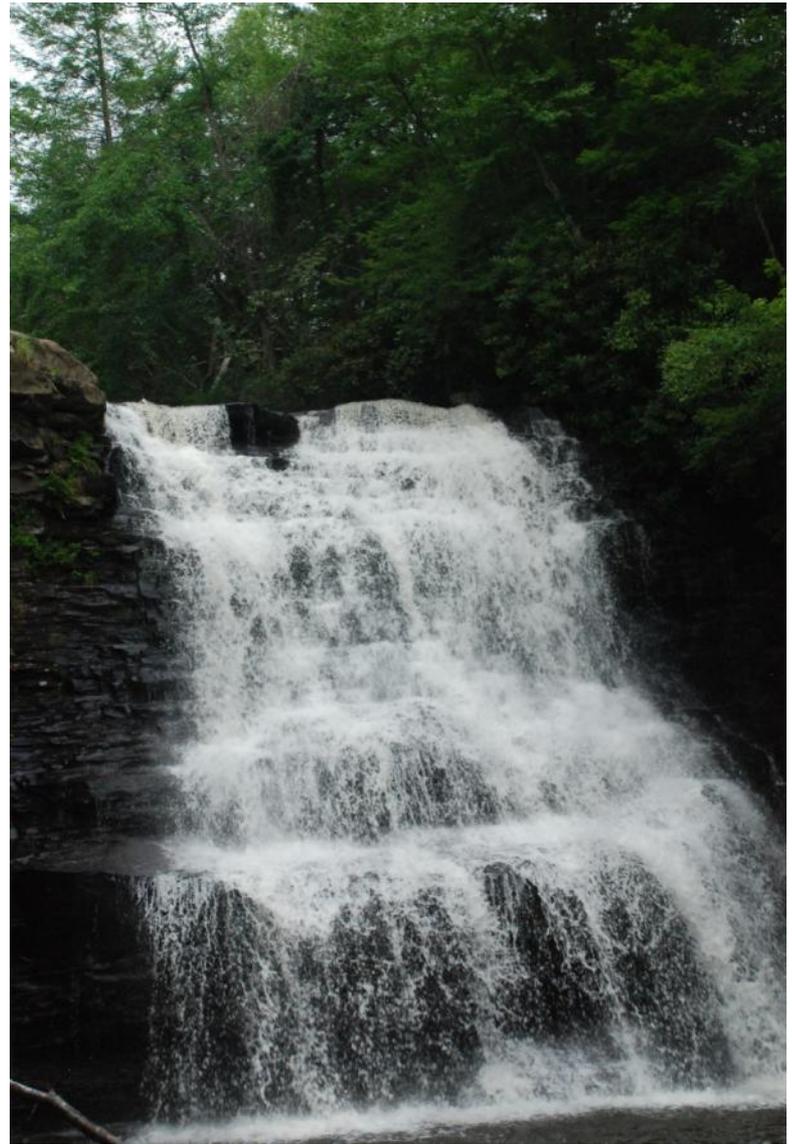
Muller explained how she uses water quality data from 22 locations to create an annual river health report card to share with local residents and elected officials the scope of the problems in the South River, which flows into the Chesapeake Bay south of [Annapolis](#).

"It ends up being a communications tool," she said. For the fledgling Upper Tigris Riverkeeper program – part of a larger nonprofit group called Nature Iraq – the hands-on training was valuable, Fatih said.

HAVE FUN!

QAPP and SOPs will

- \*Streamline your process,
- \*Provide you with high quality  
Reliable data
- \*Agencies will have trust in your  
organization
- \*Multiple uses of data
- \*It is a “Living Document”
- Most of you are already collecting  
high quality data,  
you just need to  
document your work.



Thank You,  
Capt. Diana Muller, South RIVERKEEPER  
South River Federation  
[www.southernriverfederation.net](http://www.southernriverfederation.net)