Arizona Water Watch

Citizen Science Water Quality Program

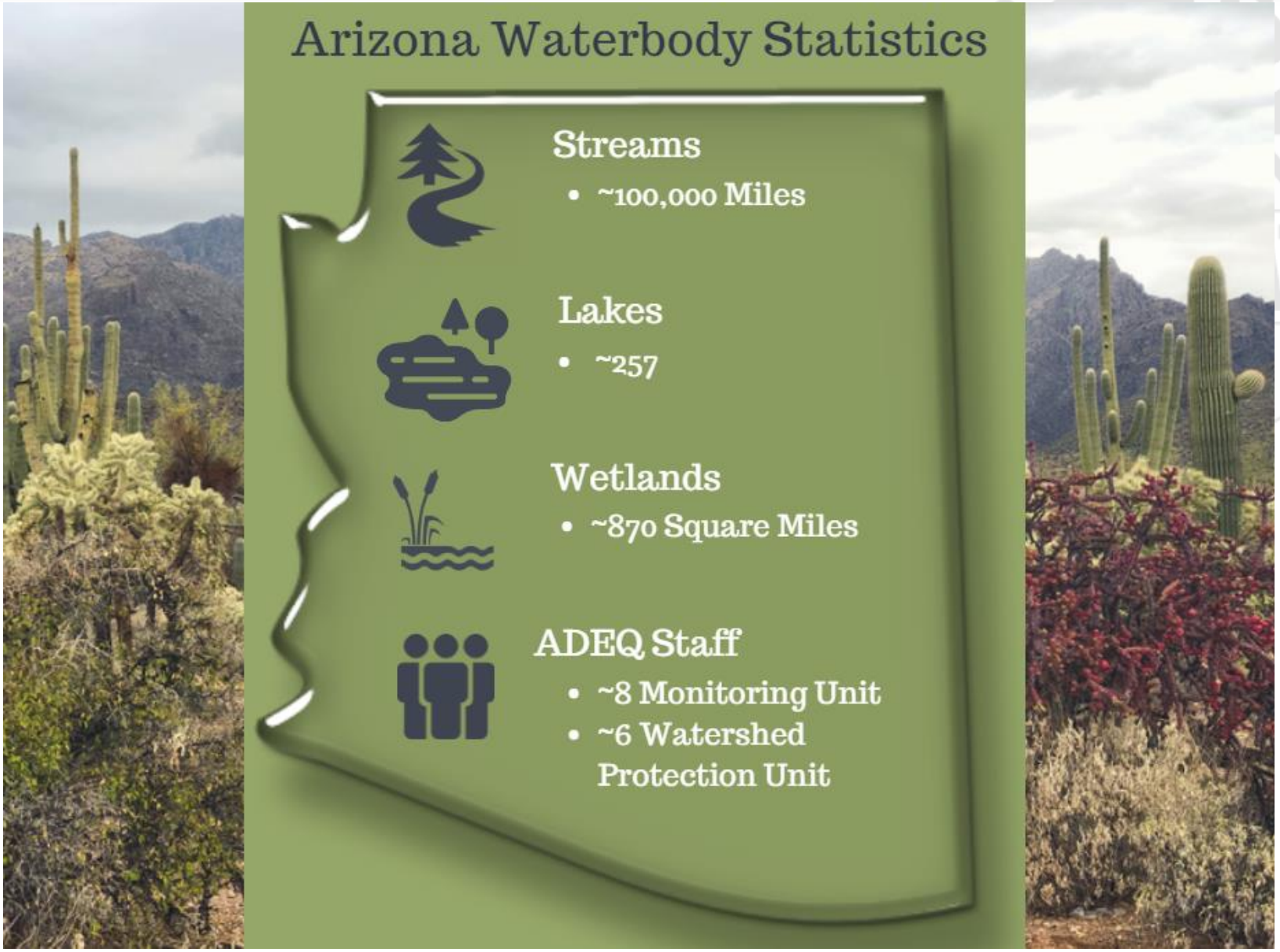
Jade Dickens, Watershed Protection Manager

May, 2018

ADEQ Arizona Department of Environmental Quality

Background - ADEQ

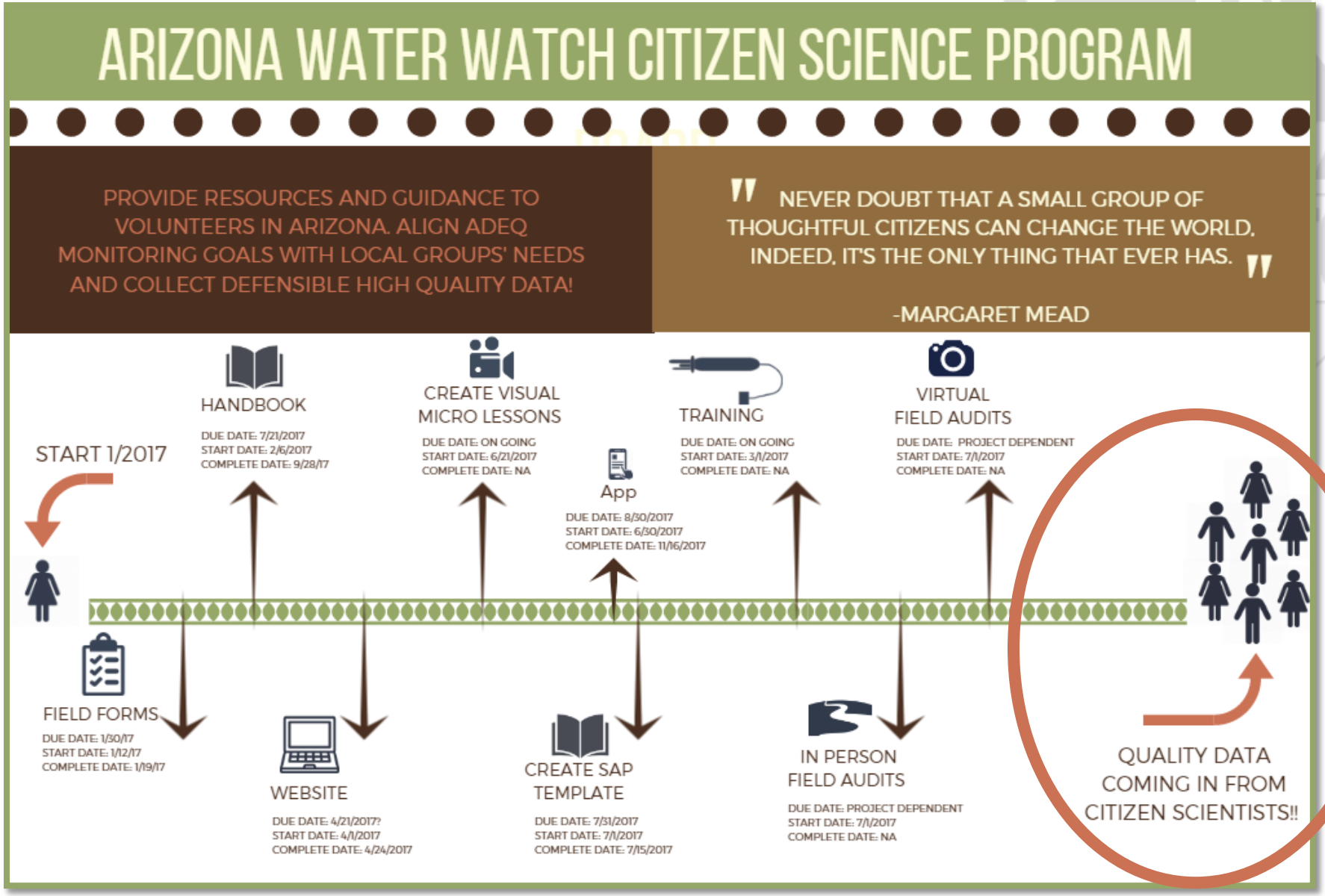
Water In Arizona



Citizen Science

ADEQ Arizona Department of Environmental Quality

Arizona Water Watch



Resources: Visually Friendly Field Forms

ADEQ Arizona Department of Environmental Quality

THEN

ADEQ Number _____

ADEQ Arizona Department of Environmental Quality

CITIZEN SCIENTISTS FIELD DATA FORM

PROJECT NAME: _____

ADEQ Site Code _ _ _ _ _ _ _ _ . _ _ _ Date _____ Water Sample Time _____

Site Name _____ Field Crew _____

GPS Coordinates _____ _____ GPS Projection _____

FIELD DATA

Air Temp.		°C	Sp. Cond.		µS/cm	Weather Conditions:
Water Temp.		°C	ORP		mV	
D.O.		mg/L	Turbidity	Avg= NTU	Sample 1=	NTU
D.O. %		%	Standard Range (e.g., 0-10)		Sample 2=	NTU
pH		SU	Calibration	Cal= NTU Read= NTU	Sample 3=	NTU

FIELD CALIBRATIONS

% D.O.	Barometric Pressure (mm Hg) =	Post-cal. Reading = %

SAMPLE COLLECTION INFORMATION

☐ Grab		☐ Reach pole	
Circle where sample taken	LEW----- ¾ ----- ½ ----- ¼ -----REW		Riffle ☐ Run ☐ Pool ☐

E. COLI

Reagent	Colilert 18 (incubation time = 18-22 hrs) ☐			Colilert 24 (incubation time = 24-28 hrs) ☐			
Dilutions	None ☐ 1:10 ☐ 1:100 ☐						
Collection Time	Regular		Incubation Time-in	Regular		Enumeration Time	Regular	
	Duplicate			Duplicate			Duplicate	
	Blank			Blank			Blank	
Number Positive Large Wells	Regular		Number of Positive Small Wells	Regular		Most Probable Number (see table)	Regular	
	Duplicate			Duplicate			Duplicate	
	Blank			Blank			Blank	
Flag (incubation/holding time exceeded?) ☐			Holding time is 6 hrs from collection.					

FIELD NOTES

NOTE ANY DEVIATIONS FROM SOPS, CHANGE IN SAMPLE LOCATION, AND ANY OTHER USEFUL INFORMATION REGARDING DATA COLLECTED AT THIS SITE.

Form Checked by _____

Page 1 of 2

NOW

ARIZONA WATER WATCH

AWW # _____

ADEQ CITIZEN SCIENCE DATA FORM

PROJECT NAME: _____ FIELD CREW: _____

SITE NAME: _____ ADEQ SITE ID: _ _ _ _ _ _ _ _ . _ _

__/__/2017 __:__ AM PM

NAD 83 LATITUDE: __ . _ _ _ _ _ _ _

LONGITUDE: _ _ _ . _ _ _ _ _ _

FIELD DATA: FILL IN THE BLANKS

AIR TEMPERATURE: _____ °C

WATER TEMPERATURE: _____ °C

DISSOLVED OXYGEN: _____ mg/L

_____ %

pH: _____ SU

SPECIFIC CONDUCTIVITY: _____ uS/cm

TOTAL DISSOLVED SOLIDS: _____ mg/L

TURBIDITY _____ NTU

SAMPLE COLLECTION INFO: CIRCLE ALL APPLICABLE INFORMATION IN EACH SECTION

GRAB POLE

LOOKING DOWNSTREAM LEW---¾---½---¼---REW

RIFFLE RUN POOL

Samples Collected QC SAMPLE NAME: _____

E. COLI METALS NUTRIENTS SSC INORGANICS

B D

CIRCLE IF APPLICABLE B= BLANK D= DUPLICATE

E. COLI: CIRCLE AND FILL IN APPLICABLE INFORMATION

DILUTION: NONE 1:10 1:100 MEDIA: COLILERT 18 COLILERT 24

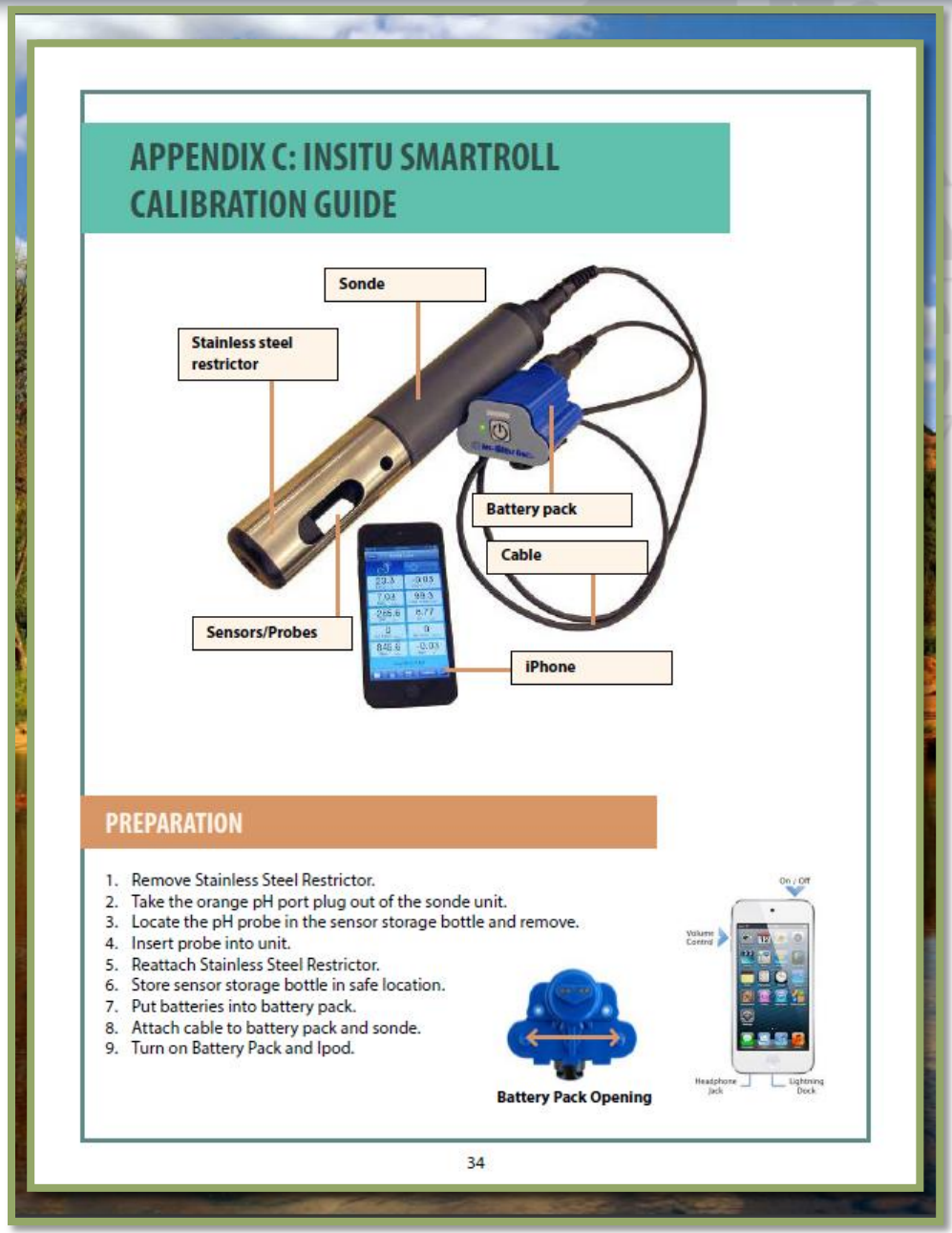
	COLLECTED	INCUBATED	COUNTED	LRG. WELL	SM. WELL	MPN
REGULAR:	AM PM	AM PM	AM PM	L	S	
DUPLICATE:	AM PM	AM PM	AM PM			
DI BLANK:	NA	AM PM	AM PM			

1 of 2

Resources: Handbook

Handbook Snippets:

- Increase Visuals
- Breakdown Form Details
- Label Equipment
  - Calibration Details Step by Step
- Updated Annually
  - Change Is Inevitable!



APPENDIX C: INSITU SMARTROLL CALIBRATION GUIDE

Sonde
Stainless steel restrictor
Battery pack
Cable
Sensors/Probes
iPhone

PREPARATION

1. Remove Stainless Steel Restrictor.
2. Take the orange pH port plug out of the sonde unit.
3. Locate the pH probe in the sensor storage bottle and remove.
4. Insert probe into unit.
5. Reattach Stainless Steel Restrictor.
6. Store sensor storage bottle in safe location.
7. Put batteries into battery pack.
8. Attach cable to battery pack and sonde.
9. Turn on Battery Pack and Ipod.

Battery Pack Opening

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Resources: SAP/QAP

FY17 Sampling and Analysis & Quality Assurance Program Plan for Verde River Institute

ADEQ Arizona Department of Environmental Quality

Verde River Institute

Verde River Institute
Arizona Water Watch
Sampling and Analysis & Quality Assurance Plan for
The Verde River

Ambient Water Quality
Fiscal Year 2017
Sampling Season March through December

ARIZONA WATER WATCH

FY17 Sampling and Analysis & Quality Assurance Program Plan for *Friends of the Tonto and Tonto NF*

FRIENDS OF THE TONTO NATIONAL FOREST

ADEQ Arizona Department of Environmental Quality

Friends of the Tonto and Tonto NF
Arizona Water Watch
and Analysis & Quality Assurance Plan f
Butcher Jones, Saguaro Lake

Ambient Water Quality
Fiscal Year 2017 & 2018
Sampling Season June-September 2017

ARIZONA WATER WATCH

FY17 Sampling and Analysis Plan for Butte Creek

Butte Creek Restoration Project
at Prescott College

Butte Creek Restoration Council
Sampling and Analysis Plan for Butte Creek

Ambient Water Quality
Fiscal Year 2017

Resources: Training

- **Annual Training!**
- Volunteers prefer to learn where they are sampling
- Do best with inside watch and learn. **THEN** outside practice
- Probes are difficult
- Notebooks provided
- Cheat sheets help

Resources: Audit checklist

- **Credible data is important!**
- Audits help verify proper sampling techniques are being used
- Typically done within the first few months after training
- Virtual field audit is an option too!

ARIZONA WATER WATCH

CITIZEN SCIENCE FIELD AUDIT

PROJECT NAME: _____ FIELD CREW: _____

CHECKLIST ITEM: Check Box if Passed

- Calibrated multi-probe prior to sampling
- Calibrated DO at site
- Placed multi-probe facing upstream
- Properly labeled bottles
- Triple rinsed bottle (if needed)
- Wore gloves when sampling
- Completely filled out datasheet
- Collected flow (estimate/float/gage)
- QC sample collected
- Notes on deviations from handbook
- Samples acidified (if needed)
- Samples placed on ice
- Used proper turbidity standard
- Proper dilution (turbidity and E.coli)
- Incubator turned on prior to sampling
- 6 hour E. coli holding time met
- Wiped down surface area with ethanol
- Wore gloves when processing E. coli
- Properly labeled E. coli trays
- Checked/intends read E.coli in 24 hours
- Post calibration of multi-probe

NOTES

INTERNAL USE:

AUDITOR NAME: _____

AUDIT DATE: _____

Arizona Water Watch App

- Released in November 2017
- Uses Survey 123 platform
- Built in-house
- Takes ~ 3 minutes to complete
  - Yes/ No Questions
  - Photos
  - Comments

ARIZONA WATER WATCH MOBILE APP

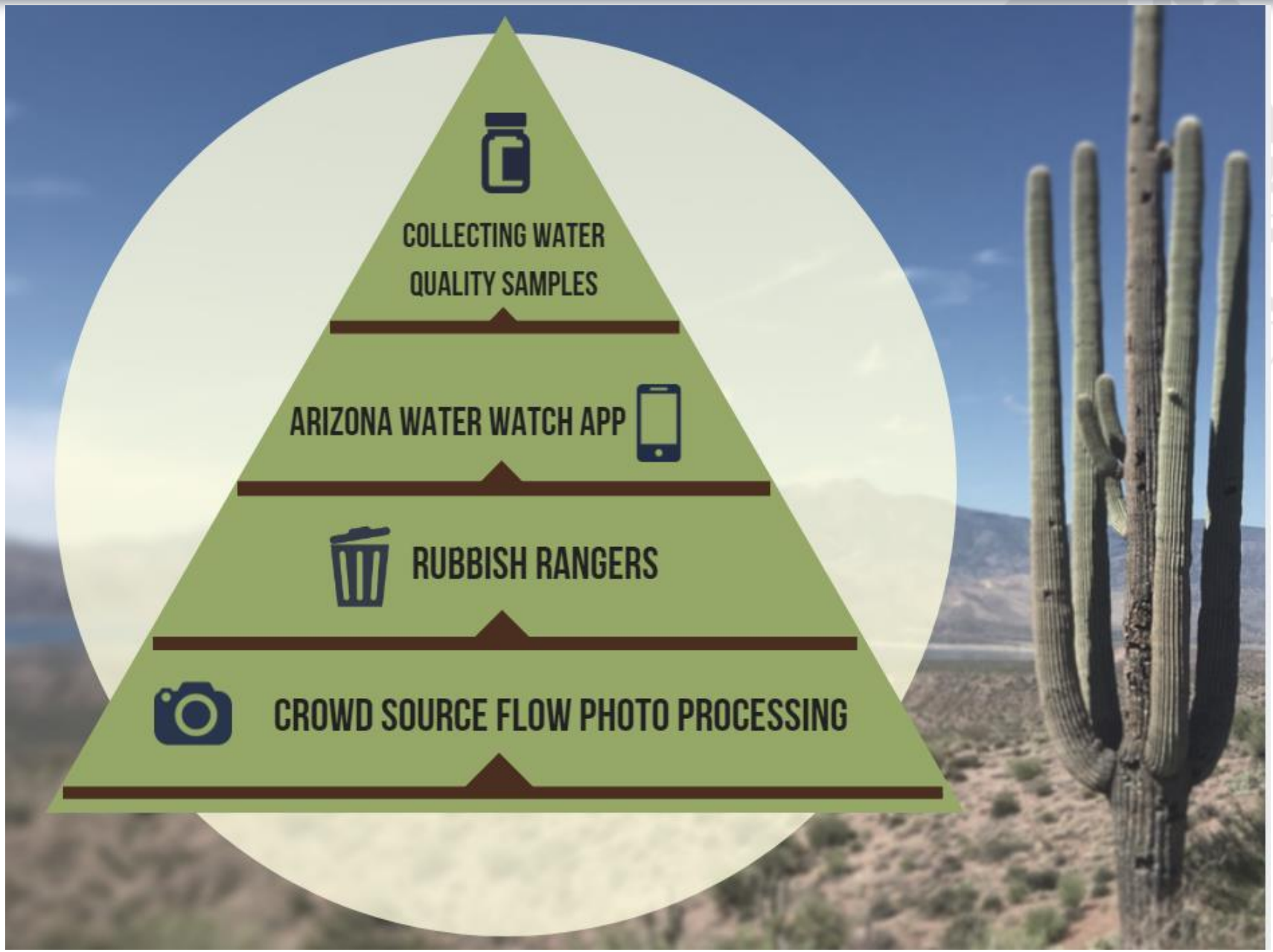
Download the **free** mobile app and instantly help **protect AZ waters**

1. Download **Survey123 for ArcGIS** (iPhone or Android) free from your app store
2. Visit **bit.ly/azwaterwatchapp**
3. Select **Open in the Survey123 field app** and complete a test survey
4. Visit **azdeq.gov/programs/azww** for other volunteer opportunities

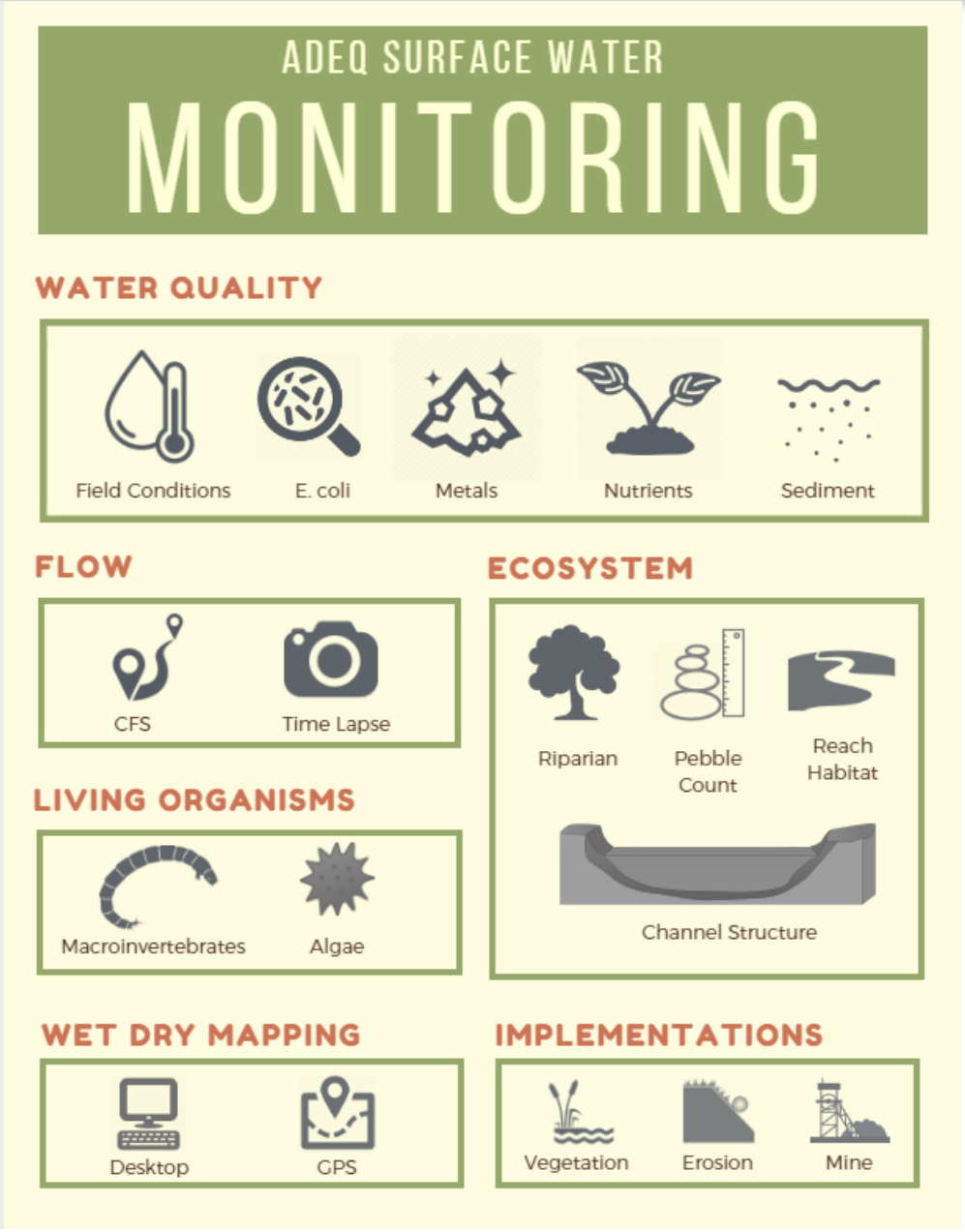
Go to a waterbody, take photos, make observations and submit. It only takes a few minutes!

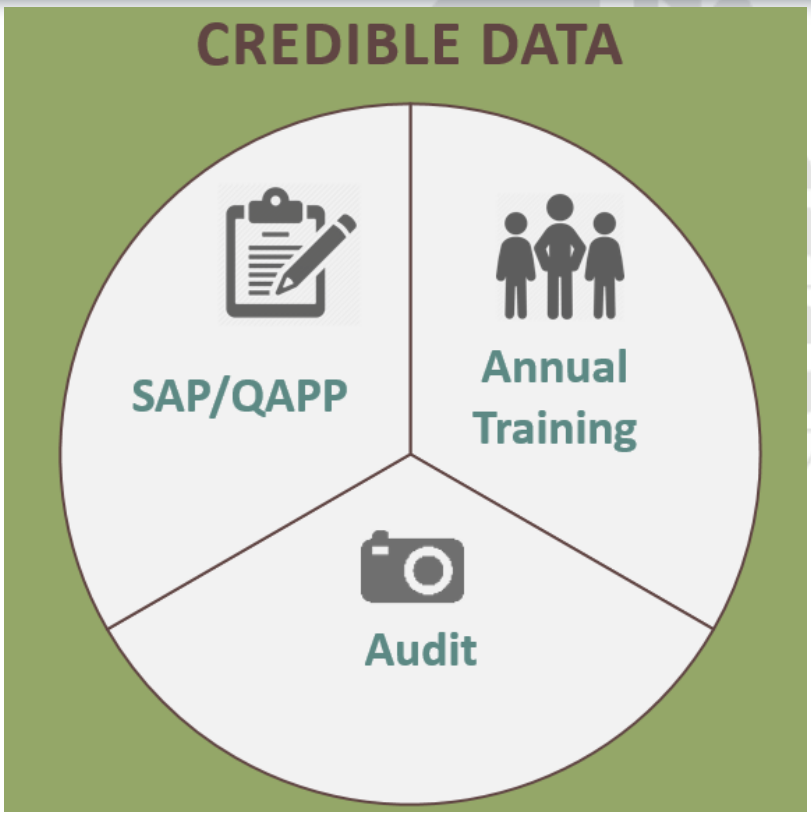
Data will be interpreted, approved and posted to an online data map for analysis and research. Your contributions allow ADEQ scientists to better discover and analyze water quality issues at the source.

Multi-Level Volunteer Opportunities



Volunteers and Credible Data

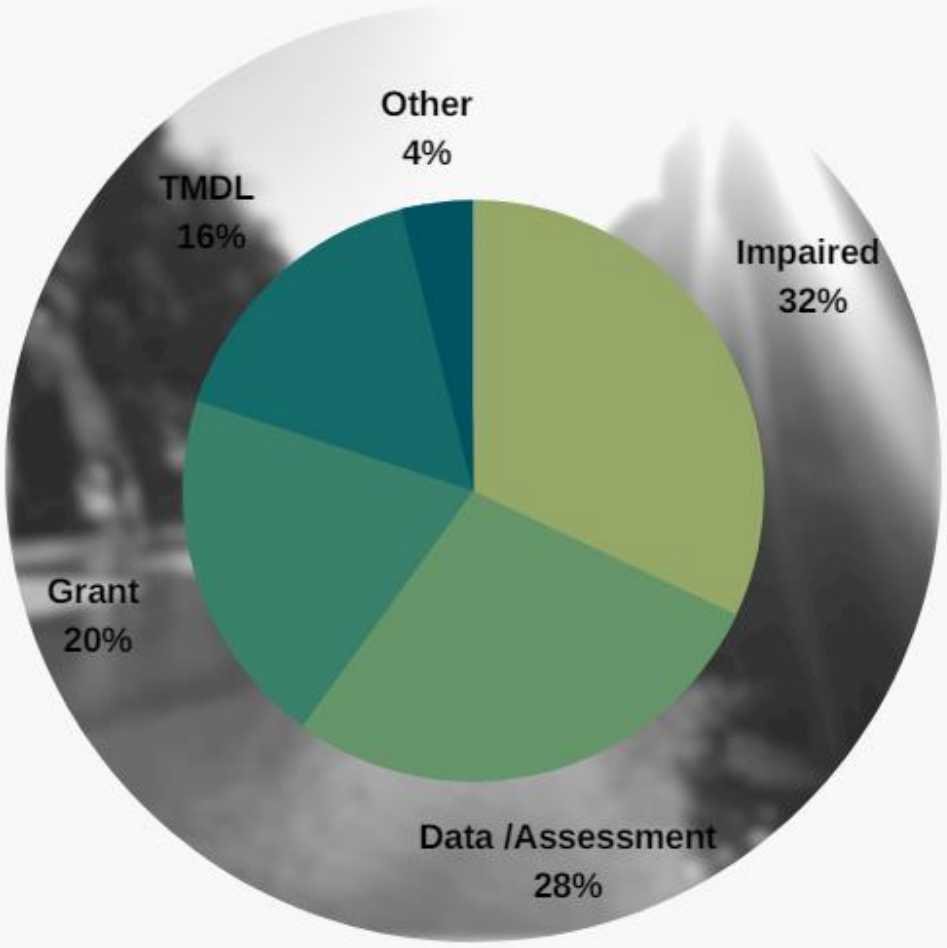




Volunteer Needs:

- Training
  - Handbook, micro-video lessons, etc.
- Scientific Equipment and Supplies
  - Loaner Library
- Study Design Assistance

Sampling Purpose Breakdown



Volunteer Recognition

How Can Citizen Science Help You?

- **Equation for success!**
- **Think Outside the Box!**
- **How can citizen science help you?**

Image from: https://whyy.org/segments/citizen-science-spring-preview/

Questions?

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