Voluntary, Non-Regulatory Watershed Management Plan for the Illinois River Watershed

2nd Stakeholder Meeting
West Siloam Springs, OK
May 18, 2023

Today's Agenda

- Introduction to the Watershed Management Planning (WMP) process
- Review October 2022 first stakeholder meeting
- Stakeholder engagement on conservation practices and water quality issues in the watershed
- Review Illinois River WMP meeting schedule and next steps

Watershed Management Plan

- Three Key Features:
  1. Water quality emphasis
  2. Nonpoint sources – non-regulatory
  3. Voluntary participation

Watershed Planning Process

- Six Steps
  1. Building partnerships
  2. Characterizing the watershed
  3. Management goals, practices, measures, actions
  4. Design implementation program
  5. Implement the Watershed Management Plan
  6. Measure progress - adaptive management

Benefits of a Watershed Management Plan

- Holistic WS assessment identifying areas with greatest ROI
- Document/demonstrate conservation doesn't cost; it pays
  - Increased landowner profitability
  - Improved soil health
- Restore/sustain fishable, swimmable, drinkable water uses
  - Increased recreational opportunities
  - Increased tourism
  - Improved aesthetics/enjoyment
- Cumulative/Synergistic Benefits

Points of Contact

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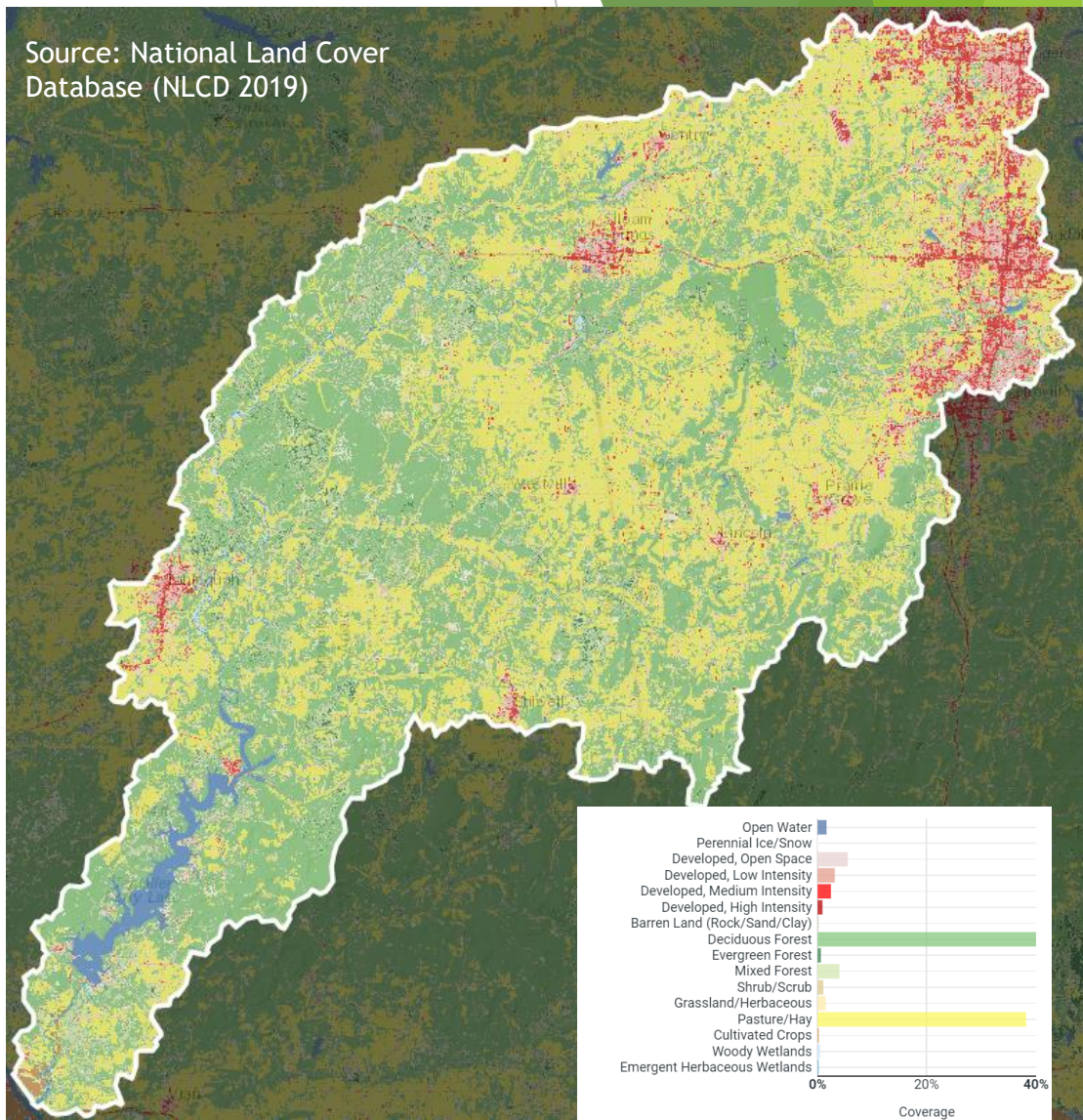
Water Quality Issues

- AR Impairments & Sources
  - Chlorides, Sulfates, Pathogens
  - Unknown, Industrial, Municipal, Surface Erosion, Agriculture
- OK Impairments & Sources
  - Total Phosphorus, Pathogens,
  - Sediment, Dissolved Oxygen
  - Multiple non-point sources

Managing Different Watershed Uses

Type	NLCD Code	2001 Area (km²)	2001 Coverage (%)	2019 Area (km²)	2019 Coverage (%)	Change (%)
Less Than 20% Impervious	21	224.4	5.25	236.5	5.53	5%
20%-49% Impervious	22	109.8	2.57	134.9	3.16	23%
50%-79% Impervious	23	54.13	1.27	104.6	2.45	93%
80%-100% Impervious	24	21.25	0.5	38.05	0.89	78%



Today's Engagement Opportunity

- Conservation Practices in the Watershed
  - Emphasis on water quality, but all input welcome
  - What's working, what's not and why
- Breakout Session
  - Facilitated discussion

Today's Engagement Opportunity

- Breakout Session
  - Two Breakout Groups
    - Rural (Agriculture, Forestry, Unpaved Roads, Streambank Erosion, Septic Remediation, Land Management)
    - Urban (Municipal, Stormwater Management, {i.e. flooding}, Residential Lawn Management)
  - Facilitated discussion for 1 hour
  - Recap information for both groups

Today's Engagement Opportunity

- **Breakout Session Ground Rules**
  - One speaker at a time
  - Request acknowledgment
  - Listen first to understand, then to be understood
  - Please do not interrupt others
  - Respect others ideas/thoughts
  - It's okay to disagree, but be respectful
  - Please no sidebar conversations

Today's Engagement Opportunity

Report Out

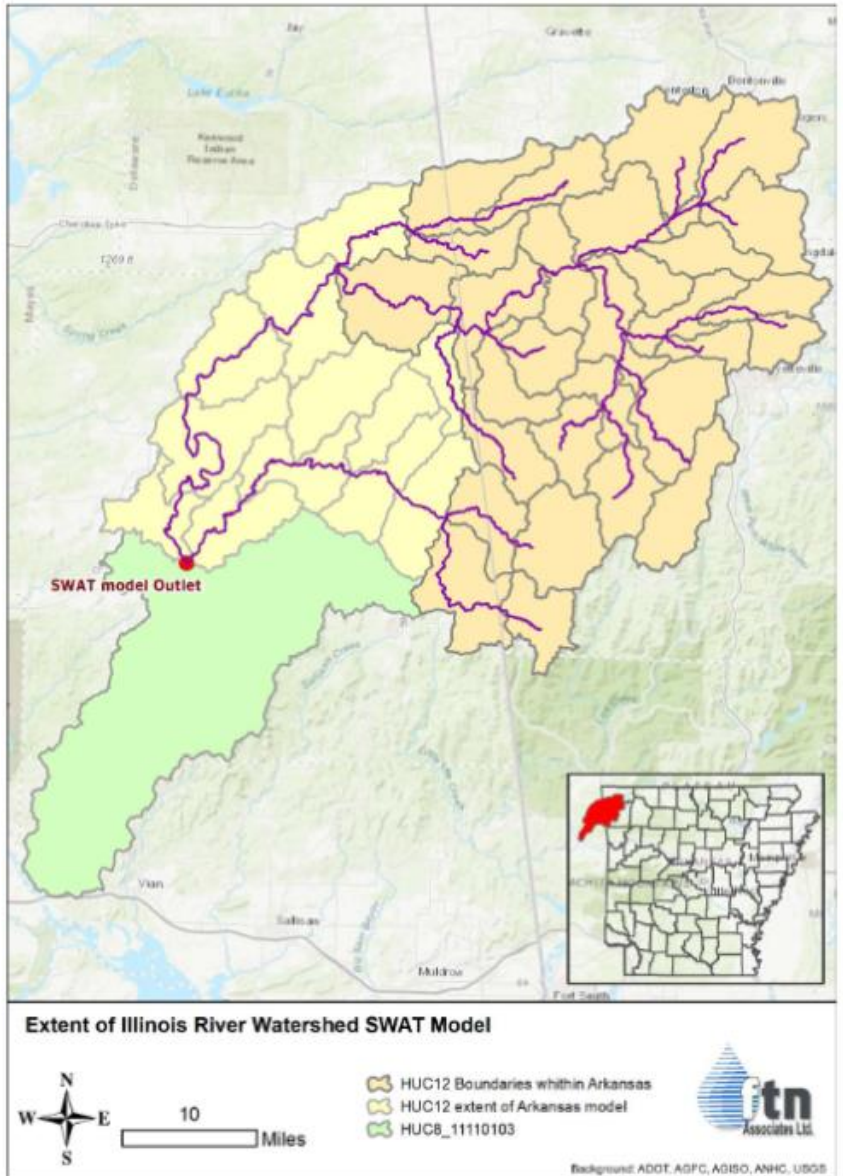
Illinois River WMP Meeting Schedule

- October 2022 – 1st Introductory Meeting
- May 2023 – 2nd Stakeholder Engagement & Conservation Practices
- July/August 2023 – 3rd SWAT Model Report
- October 2023 – 4th Information Summary
- TBD (if needed) 2023

Arkansas SWAT Updates

Model Inputs

- 28 HUC12s partially or fully within AR
- Calibration period: 1/2/1996-12/31/2020
- Six-year warm up period
- June 2021 USGS DEM
- NLCD land use 2001-2019



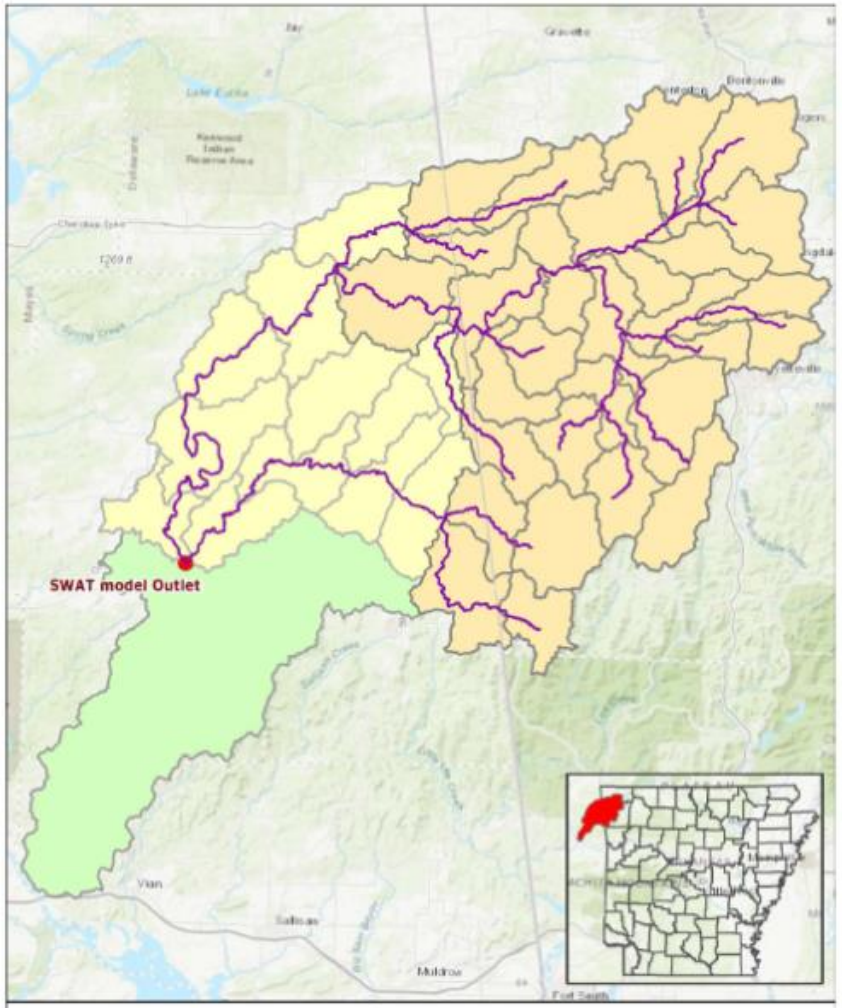
Arkansas SWAT Updates

Model Inputs

- Point Source

NPDES permit number	Facility name or description	Average flow (MGD) [1]	Discharges during simulation period	
			Begin date	End date
AR0020184	City of Gentry WWTP [2]	0.58	Jan. 1990	Dec. 2020
AR0020273	City of Siloam Springs WWTP	3.20	Jan. 1990	Dec. 2020
AR0022063	City of Springdale WWTP	14.56	Jan. 1990	Dec. 2020
AR0022098	City of Prairie Grove WWTP	0.64	Jan. 1990	Dec. 2020
AR0033910	USDA Forest Service – Lake Wedington Recreation Area	0.03	Jan. 1990	Dec. 2020
AR0035246	City of Lincoln WWTP	0.62	Jan. 1990	Dec. 2020
AR0043397	City of Rogers WWTP	8.24	Jan. 1990	Dec. 2020
AR0050024	NW Arkansas Conservation Authority Regional WWTP	3.07	Dec. 2010	Dec. 2020
AR0050288	City of Fayetteville West Side WWTP	8.87	Jun. 2008	Dec. 2020
ARG250008	Zero Mountain, Inc. (cooling tower blowdown)	0.002	Aug. 2009	Jan. 2019
ARG640066	City of Prairie Grove Water Treatment Plant (filter backwash)	0.04	Jan. 1990	Dec. 2020

Notes: 1. Average flows are for January 2018 – December 2020 to reflect current magnitude of discharges. MGD = million gallons per day.
2. WWTP = wastewater treatment plant

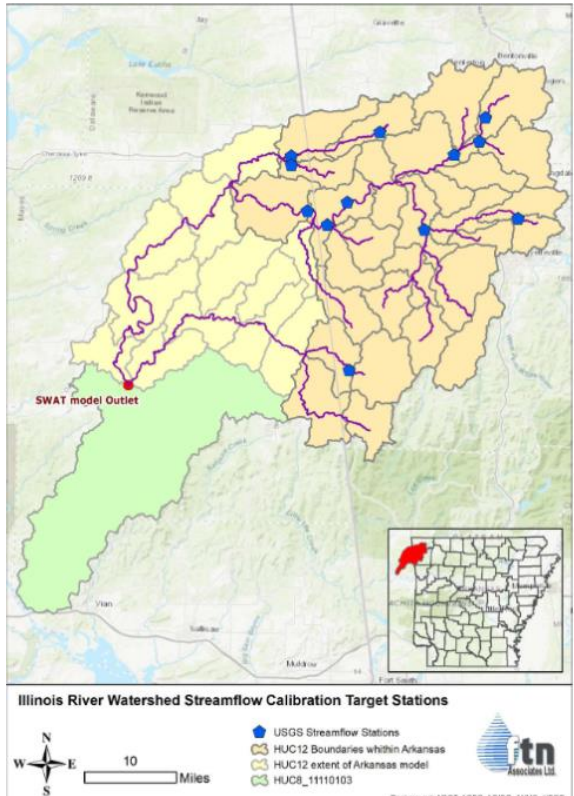


Arkansas SWAT Updates

Model Inputs

- Parameter-elevation Relationships on Independent Slopes Model (PRISM) daily data
  - Precip, max/min/mean temp, dew point
- Daily stream flow data
- Water quality data
  - ADEQ, USGS, AWRC
  - Model calibrated to 16 locations

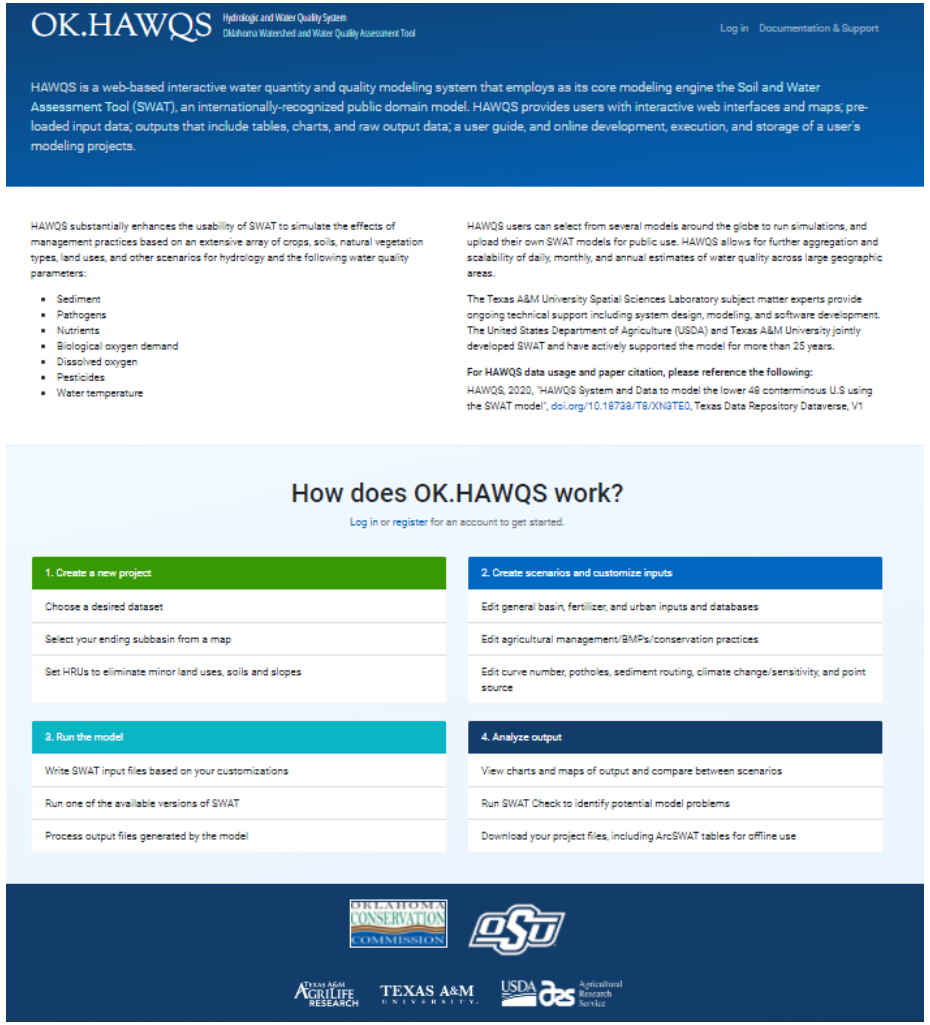
Gage number	Gage name	Available data within calibration period	
		Begin date	End date
07194800	Illinois River at Savoy, AR	9/30/2001	12/31/2020
071948095	Mud Creek near Johnson, AR	9/30/2015	12/31/2020
07194880	Osage Creek near Cave Springs, AR	4/07/2000	12/31/2020
07194933	Spring Creek at Hwy 112 near Springdale, AR	10/17/2011	12/31/2020
07195000	Osage Creek near Elm Springs, AR	1/01/1996	12/31/2020
07195400	Illinois River at Hwy 16 near Siloam Springs, AR	10/01/2002	12/31/2020
07195430	Illinois River South of Siloam Springs, AR	1/01/1996	12/31/2020
07195500	Illinois River near Watts, OK	1/01/1996	12/31/2020
07195800	Flint Creek at Springtown, AR	1/01/1996	12/31/2020
07195855	Flint Creek near West Siloam Springs, OK	1/01/1996	12/31/2020
07195865	Sager Creek near West Siloam Springs, OK	9/12/1996	12/31/2020
07196900	Baron Fork at Dutch Mills, AR	1/01/1996	12/31/2020



Oklahoma SWAT Updates

Model developed/hosted on the OK-HAWQS platform

- Developed with and hosted by Texas A&M
- Cloud based model using SWAT 2012 as the hydrologic model
- Base version of the model is flow calibrated
- Working on WQ calibration
- Ability to share, duplicate, run scenarios and modify models hosted on the site
- Ability to download models, edit, modify, run scenarios and upload back to the website

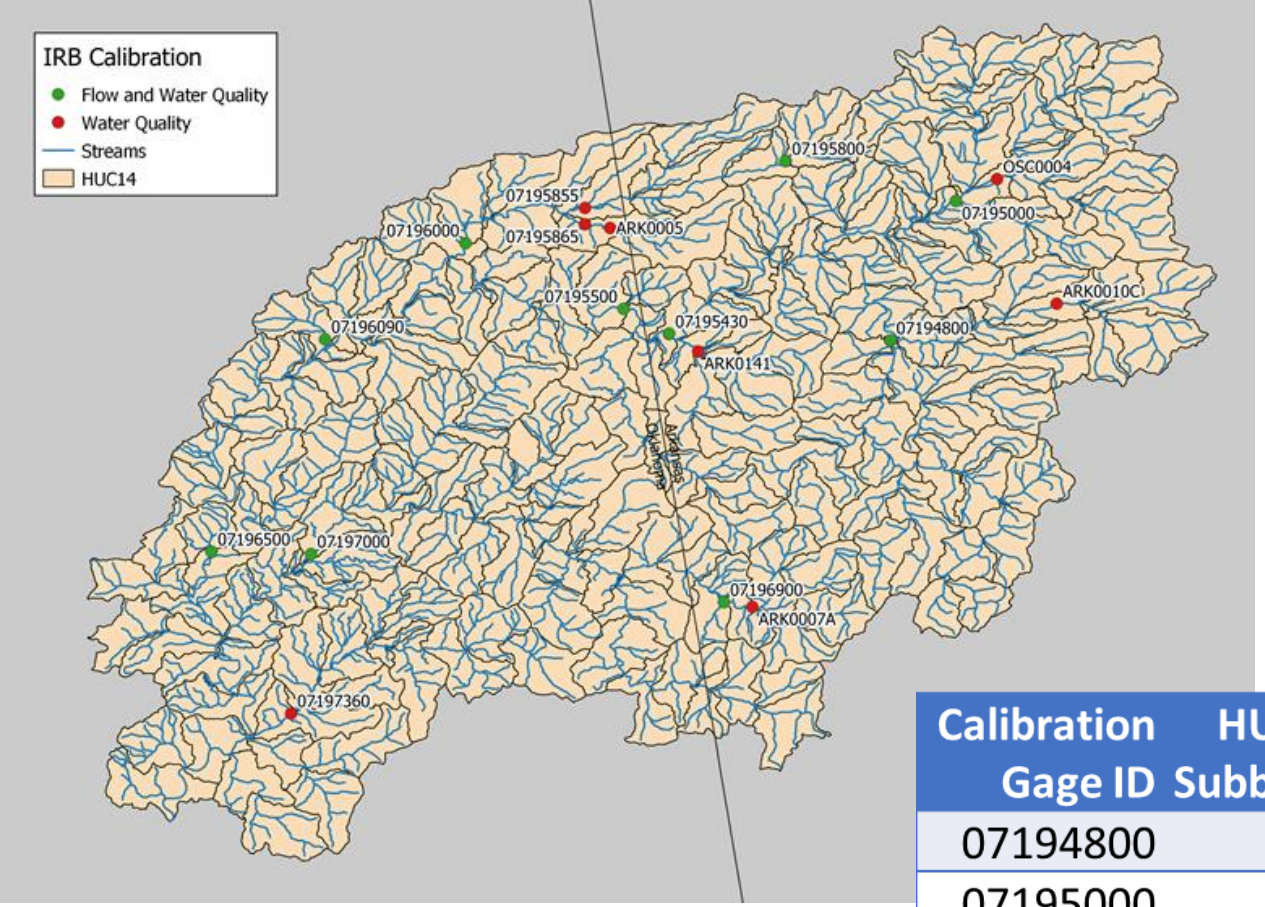


Oklahoma SWAT Updates

OKLAHOMA CONSERVATION COMMISSION

Input Dataset	Source	Specifications
Climate	Parameter-elevation Regressions on Independent Slopes Model (PRISM)	1981 – 2018 (gridded)
Atmosphere Deposition	National Atmospheric Deposition Program (NADP)	(1980 – 2010) monthly
Watershed Boundaries	National Hydrography Dataset Plus 2.0 (NHDPlus)	HUC 12
Land Use (non-agricultural)	National Land Cover Database (NLCD)	2016
Land Use (agricultural)	United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL)	2016 – 2018
Soil	USDA Natural Resources Conservation Service (NRCS) Soil Survey Geographic Data (SSURGO)	County level 2019
Elevation	USGS National Elevation Dataset (NED) and Digital Elevation Model (DEM)	10 meter 2019
Stream Network	National Hydrography Dataset Plus 2.0 (NHDPlus)	2019
Dams, Ponds, and Reservoirs	National Inventory of Dams (NID) and NHDPlus 2.0	2018; 2019
Point Sources	Water Quality eXchange (WQX) and National Pollutant Discharge Elimination System (NPDES)	2020
Management Data	USDA-NRCS crop management zone data	2010

Oklahoma SWAT Updates



- **Flow calibration is complete for 10 USGS gage locations in the Illinois River Basin at HUC 12level**
- **Water Quality calibration is being donw at HUC 14 on 16 locations**

- **Other Data compiled for WQ calibration**
  - **Point Source Data (OK and AR**
  - **Land Management Data**
    - **e.g., manure spread across landscape, quantity/timing**

Calibration Gage ID	HUC14 Subbasin	Calibrated Variable	R2	NS	PBIAS	KGE	Mean_sim	Mean_obs
07194800	14	Flow (AR)	0.85	0.69	-49.8	0.48	8.15	5.44
07195000	30	Flow (AR)	0.82	0.66	29.8	0.67	3.61	5.14
07195800	59	Flow (AR)	0.62	0.45	-20.2	0.67	0.56	0.47
07195430	93	Flow (AR)	0.88	0.86	8.5	0.88	17.92	19.58
07196900	101	Flow (AR)	0.75	0.65	-37.1	0.61	2.01	1.47
07196000	72	Flow (OK)	0.79	0.77	3.7	0.88	3.34	3.47
07195500	97	Flow (OK)	0.85	0.82	2.1	0.87	19.79	20.21
07197000	137	Flow (OK)	0.88	0.84	-19.9	0.79	12.71	10.6
07196090	149	Flow (OK)	0.94	0.9	-6.6	0.81	27.31	25.63
07196500	161	Flow (OK)	0.86	0.84	1.8	0.9	29.99	30.55

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