

**Water Resources Board Meeting  
February 02, 2017  
1:00 PM EDT  
Training Room A  
300 Sower Blvd  
Frankfort, Kentucky 40601**

1. Call Meeting to Order and Roll Call of Board Members
2. Introduction of Guests
3. Minutes of November, 2016
4. Water Resources Discussion with Colonel Chris Beck, USACE
5. Final Projects Profiles Report
6. Open Discussion for Board Members
7. Public Comment Period
8. Next Meeting

**Water Resources Board  
Draft Meeting Minutes  
February 2, 2017**

Board Members in Attendance: Earl Bush (County Judge Executives); Brent Burchett (Proxy, KDA); Steve Coleman (KY Farm Bureau); Lloyd Cress, Jr. (KY League of Cities); Dr. Nancy Cox (UK); John Dix (KRWA); Kate Shanks (Proxy, KY Chamber of Commerce); Charles Snavely (EEC Secretary); Shane Wells (Proxy, KACD);

Board Members Absent: Jared Carpenter (LRC); Kevin Jeffries (Soil and Water Conservation Districts); Kevin Rogers (KY Chamber of Commerce); Ryan Quarles (Commissioner Dept. of Agriculture);

Others in Attendance: Paulette Akers (Director DCA); Adam Andrews (KYCGA); Amy Babey (USACE); Biff Baker (GOAP); Angela Billings (DPH-EMB); Steve Blanford (NRCS); Chloe Brantley (DOW); Brandon Brummet (USACE); Lane Boldman (KY Conservation Committee); Joe Cain (KYFB); Bill Caldwell (DOW); David Chinn (Monty's Plant Food Co.); Pete Cinotto (USGS); Allison Crawford (KYSEC); Lee Anne Daveine (USACE); Nicole Erwin (OVR); Peter Goodmann (Director DOW); Mike Griffin (USACE); Amanda Gumber (UK-CES); Richard Harrison (ORSANCO); Steve Higgins (UKCAFE); Wayne Hunt (Hunt Farms); Carey Johnson (DOW); Samantha Kaiser (DOW); Aaron Keatley (Commissioner DEP); Jim Kipp (KWRR); Allen Kyle (Kyle Farms); Gary Larimore (KRWA); David London (USACE); Hailey McCoy (EEC); Kim Richardson (DOC); Bijaya Shrestha (KWA); Joscoh Sisk (Sisk Farms); Larry Thomas (Farmer); Michael West (EEC-OGC); Karen Woodrich (USDA-NRCS);

The meeting began at 1:05 p.m.

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Introduction of Guests

Secretary Snavely introduced Colonel Chris Beck from the US Army Corps of Engineers (USACE). He is the Commander of the Louisville District. Colonel Beck introduced his team from the Louisville District.

Guests introduced themselves.

Minutes of November, 2016

The meeting minutes from November were approved by consensus.

Water Resources Discussion with Colonel Chris Beck, USACE

Colonel Beck gave a presentation about the USACE authorities. He discussed the civil works watershed-based boundary lines which cover five states and are centered in Kentucky. The Louisville District regulates Indiana, Illinois, and Kentucky. The USACE strives to provide consistency in all areas. Budgets vary for different projects and programs. USACE provide funding for individual projects in navigation, flood and storm risk management, aquatic ecosystem restoration, and watershed planning, as well as,

programs in emergency management and regulatory programs. A smaller portion of the budget funds hydropower, recreation, and water supply. Colonel Beck stressed to the Board that though a policy may be authorized does not mean that funds have been appropriated to implement it. The 2016 Water Infrastructure Improvements for the Nation (WWIN) Act is the newest legislation which incorporated the Water Resources Development Act (WRDA). Several authorities were mentioned and the USACE asked the public to discuss how these authorities can benefit their projects. The Kentucky Silver Jackets is a group of organizations that meet every six weeks to share and leverage information and resources to improve flood risk management across the Commonwealth.

Lee Anne Devine gave a presentation on regulatory updates to the Board. She encourages the public to ask questions and reach out to the USACE. The USACE goal is to work with applicants to get approval and applicants are encouraged to have a pre-project meeting to discuss future projects and applications with the USACE. Most applications are revised before approval. Options with lesser environmental impact receive approval. The key for the applicant is having an open dialogue with USACE. If an approved option cannot be completed, the applicant can discuss other options with the USACE. The main two statutes that are regulated are Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

The Board asked Ms. Devine to further explain what qualifies as a permit exemption and how land owners should be advised on the application process. Ms. Devine reiterated that the USACE encourages anyone with questions to call before beginning a project for which a permit could be required, which is preferable to having the USACE perform a site visit after the project is completed. A written exemption request can be submitted to the USACE and could be issued within 60 days of receipt. If the exemption request is denied it could take up to four months to develop an application and receive an approved permit.

The USACE proposed rule for use of USACE reservoir projects for domestic, municipal and industrial water supplies is currently in the Federal Register and is open for comments until February 14, 2017.

Colonel Beck discussed the Ohio River Basin Comprehensive (ORBC) Plan initiative which is a collaboration of various agencies and stakeholders across 14 states to provide a strategic plan for prioritizing investments in order to efficiently and effectively address water resource related issues using a watershed approach. The Great Lakes Restoration Initiative has received consistent funding while Ohio River Division funds have decreased. The ORBC initiative could help with funding in the Ohio River Basin. The Ohio River Basin Alliance (ORBA) is leading the ORBC initiative and needs to maintain the momentum.

The Board would like a subgroup to continue discussions with Colonel Beck and the USACE. Colonel Beck discussed the challenges with creating a flow chart for possible exemptions and projects that could require permits because each individual project is unique, and cautioned that such a chart could be misleading.

#### Final Projects Profiles Report

Bill Caldwell (DOW) discussed the final project profile ranking results. The State Water Plan ranked number one. He reminded the Board of the two working committees (technical data committee and roadmap), members of the committees, and the areas of focus.

Motion: (John Dix) To recommend that the Cabinet pursue funding for projects that further the goals of the Water Resources Board to:

1. Develop technical data and studies that are necessary for the development of a State Water Plan, or
2. Implement additional surface, groundwater or soil moisture monitoring where it is determined to be necessary to quantify and manage water resources for planning purposes including drought monitoring and response; and
3. That the Cabinet will notify the Board as to when the Cabinet pursues funding opportunities and discuss the proposed project with the Water Resources Board at the next Board meeting.

Second: (Steve Coleman)

The Board further discussed the motion until all members understood the motion.

Vote: Unanimous

The two working committees will meet before the next Board meeting.

#### Open Discussion for Board Members

Mr. Coleman reminded the Board of the Kentucky Farm Bureau Water Management Work Group recommendations.

#### Public Comment Period

No public comments were made.

#### Next Meeting

Mr. Goodmann recommended that a future meeting be at Eden Shale. The Kentucky Farm Bureau Water Management Work Group meeting at Eden Shale is April 26, 2017. The Board will communicate through email to confirm meeting.

The meeting adjourned at 3:22 p.m.



Water Resources Board Meeting  
 300 Sower Blvd, Frankfort, KY 40601  
 February 2, 2017

## PUBLIC SIGN-IN SHEET

<u>Name</u>	<u>Agency/Organization</u>	<u>Email Address</u>	<u>Phone number</u>
✓ Dan London	USACE	dan.l.london@usace.army.mil	502-315-6597
✓ Amy Babey	USACE	amy.s.babey@usace.army.mil	502-315-6880
✓ LEE ANNE DEVINE	USACE	Lee.Anne.DEVINE@USACE.ARMY.MIL	502 315 6692
✓ Brandon Brummett	USACE	brandon.f.brummett@usace.army.mil	502-315-6883
✓ Mike Griffin	USGS	Mgriffin@usgs.gov	502 493-1913
✓ Karen Woodrich	USDA - NRCS	Karen.Woodrich@ky.usda.gov	859-516-3134
✓ Kim Richardson	DOC	Kimberly.richardson@ky.gov	502-982-6751
✓ RICHARD HARRISON	ORSANCO	rharrison@orsanco.org	859-393-4661
✓ ANGEA BILLINGS	DPH - EMB	ANGEA.BILLINGS@KY.GOV	502 564 4856
✓ Joe Cain	KYFB	Joe.cain@kyfb.com	502-303-3663
✓ Carey Johnson	DOW	Carey.johnson@ky.gov	502-782-6990
✓ Amanda Gumbert	UKCES	Amanda.gumbert@uky.edu	859-257-6014
✓ BIFF BAKER	GCAP	BIFF.BAKER@KY.GOV	502 564 4627
✓ STEVE HIGGINS	UKCAFE		
✓ LANE BOLDWIN	KY. CONSERVATION COMMITTEE	LANE.BOLDWIN@KYCONSERVATION.ORG	502-229-9659
✓ Nicole Smith	Ohio Valley Meson	nicole.smith@ohiovalleymeson.com	270-293-1053
✓ GARY LARIMORE	Ky Rural Water Assoc	G.LARIMORE@KRWAA.ORG	270-843-2291



✓ Samantha Kaiser	DOW	Samantha.Kaiser@Ky.gov	502-782-6995
✓ Jim Kipp	KWRRI	KIPP@UKY.EDU	859-257-1832
✓ J. Michael West	EEC - OGC	michael.west@Ky.gov	502 782 7131
✓ HALEY McCoy	EEC	Haley.mccoy@ky.gov	502-782-7011
✓ Bijaya Shrestha	Kentucky waterways Alliance	bijaya@kwalliance.org	859 433 5363
✓ Allison Crawford	Kentucky Student Environmental Coalition	allisoncrawford2216@gmail.com	270-293-6278
✓ Josh Sisk	SISK FARMS	Hopkinsville	
✓ Wayne Hunt	HUNT Farms	Christine Cassey	whunt@trappipower.com
✓ Allen Kyle	Kyle Farms - AN2A	allen.kyle@att.net	270-519-4203
✓ Larry Thomas	Farmer	bltfarms@windstream.net	270 723-6171
✓ Adam Andrews	Ky Corn Grower Assn	adam@kycorn.org	502-974-1121
✓ Steve Blanford	NRCS	steve.blanford@ky.usda.gov	859-227-6252
✓ Aaron Keatley	DEP	aaron.keatley@ky.gov	502-564-2150
✓ Paulette Alers	DCA	Paulette.Alers@ky.gov	502-564-0323
✓ Chloe Brantley	DOW	chloe.brantley@ky.gov	502-782-6898
✓ David Chinn	Monty's Plant Food Co.	DChinn@montysplantfood.com	502-489-9888
✓ Bill Caldwell	DOW	bill.caldwell@ky.gov	502-782-6906
✓ Pete Cinotto	USGS	Pcinotto@USGS.GOV	502-493-1930





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**Water Resources Board**

**February 02, 2017**

**Department for Environmental Protection  
Energy and Environment Cabinet**



*To Protect and Enhance Kentucky's Environment*

**Kentucky**  
UNBRIDLED SPIRIT™

# Project Profile Ranking Results

Project Profiles	Project Title	Project Duration	Annual Cost	Score	Minimum	Maximum
DOW-1	State Water Plan Initial Project Profile (see separate attachment)	5 year	\$130,000	1.4	1	3
KGS-1	Kentucky Groundwater Observation Network	3 year	\$122,000	2.2	1	3
WKU-1	Kentucky Mesonet Station Acquisition and Installation	5 year	\$45,000	4.8	3	7
WKU-2	Kentucky Mesonet Soil Monitoring	2 year	\$36,000	4.8	2	8
USGS-2	Streamflow Gaging Stations in Critical Areas with Existing Data Gaps	3 year	\$90,000	4.8	1	9
USGS-1	Agricultural and Drought Data Management and Integration Application for Kentucky	1 year	\$40,000	5.8	2	9
UK-1	Stormwater management, Water Harvesting, and the LEAF Program	Variable	\$20,000 - \$130,000	6.3	4	9
WKU-3	Kentucky Mesonet Precipitation Monitoring	2 year	\$124,000	7.3	3	11
KGS-2	A Groundwater Withdrawal Assessment Tool for the Jackson Purchase Region	1 year	\$50,000	7.5	5	11
USGS-3	Water Quality Monitoring Stations to Better Quantify Nutrient Loading from Kentucky	3 year	\$276,000	8.0	3	11
WKU-4	Summaries, Forecasts and Outlooks	2 year	\$200,000	9.2	5	11



## **Working committees**

- **Technical Data Committee**
- **Roadmap Committee**

# Committee Actions and Meetings

## State Water Plan

### TECHNICAL DATA AND STUDIES

**Active Groundwater Level Network**  
Sunday, October 30, 2018

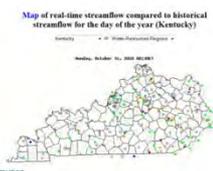


**I. WATER AVAILABILITY**

Regional Water Inventories  
Annual and Seasonal "Surplus/Deficit"

- Existing withdrawal demand
- Instream Flow demands

Map of real-time streamflow compared to historical streamflow for the day of the year (Kentucky)






### TECHNICAL DATA AND STUDIES



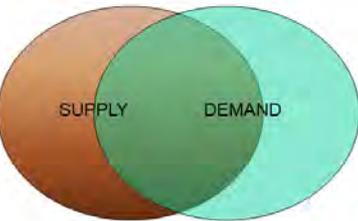
**II. DEMAND FORECASTING**

- Population-driven Demands
- Agricultural Demands
- Energy Sector Demands
- Industrial Demands




### TECHNICAL DATA AND STUDIES

**GAP ANALYSIS**



Where does available supply not meet current demand?  
Where will available supply not meet future demand?  
Why does the GAP exist?  
What are potential solutions?

**"HOT SPOT" ANALYSIS**

Which GAPS are most critical?




### PLAN DEVELOPMENT



**REGIONAL FOCUS**

**STAKEHOLDER DRIVEN**



What issues are seen as priorities at the local/regional level?  
What needs to be in the plan?

**\*\*Inform the development of a statewide water resources plan.**




# Committee Actions and Meetings

## Technical Data Committee

### Areas of Focus

Review and advise on data and technical studies related to Water Board-recommended projects

Review the Literature; propose areas of study, data and research to improve understanding and management of the Kentucky water resources

Assist in the oversight and development of technical studies that support a State Water Plan

Facilitate the implementation of KFB Water Management Working Group Recommendations

Pete Goodmann

Todd Griffin - Agribusiness

Kevin Rogers – Chamber of Commerce / Water Use and Demand

Steve Coleman – Kentucky Farm Bureau

John Dix – KRWA / Rural Water issues

Brent Burchett – Dept of Agriculture / Agricultural issues

Biff Baker – GOAP, Agricultural Issues

USGS

KGS

Kentucky Climate Center

Other as required



# Committee Actions and Meetings

## Plan Development Roadmap Committee

### Areas of Focus

Review existing state water plans from peer states as part of a preliminary plan development process

Develop goals and scope of a state water plan – draw upon the best parts of other states

Identify critical participants in water planning – agency partners, consultants

Provide leadership and oversight for state water planning and water resources development opportunities as they arise

Facilitate the implementation of KFB Water Management Working Group Recommendations

Pete Goodman

Carey Johnson

Steve Workman – University of Kentucky / Agriculture

Kevin Jeffries – Soil & Water Conservation Districts

Kevin Rogers – Chamber of Commerce / Water Use and Demand

Rusty Cress – KY League of Cities

Gary Larimore – KRWA / Rural Water issues / planning

Biff Baker – GOAP, Agricultural Issues

KY Water Resources Research Inst.  
Other as required



# Miscellaneous Funding Opportunities

**Opportunities for obtaining funding for projects that align with the duties of the Water Resources board as provided in KRS 151.113:**

**Research emerging water resources issues**

**Developing new and reliable water sources**

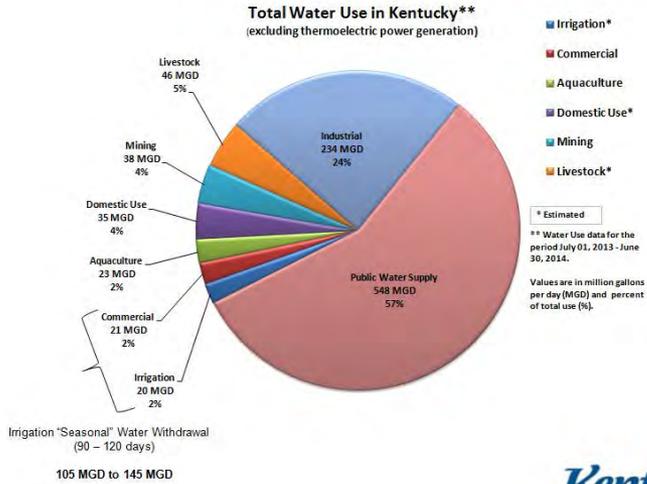
**Water use efficiency, water conservation and drought mitigation for farm and rural communities**

**Monitoring and data needs for water quality and quantity**



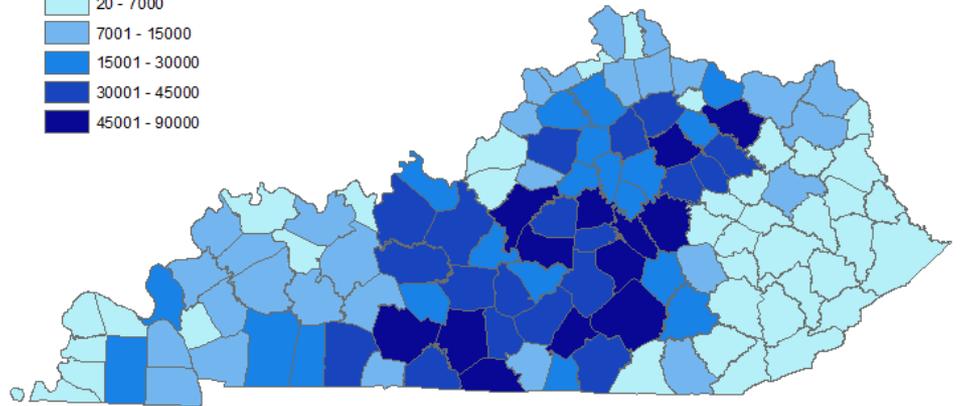
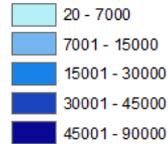
# A closer look at water use in Kentucky

## Total Water Use in Kentucky\*\* (excluding thermoelectric power generation)



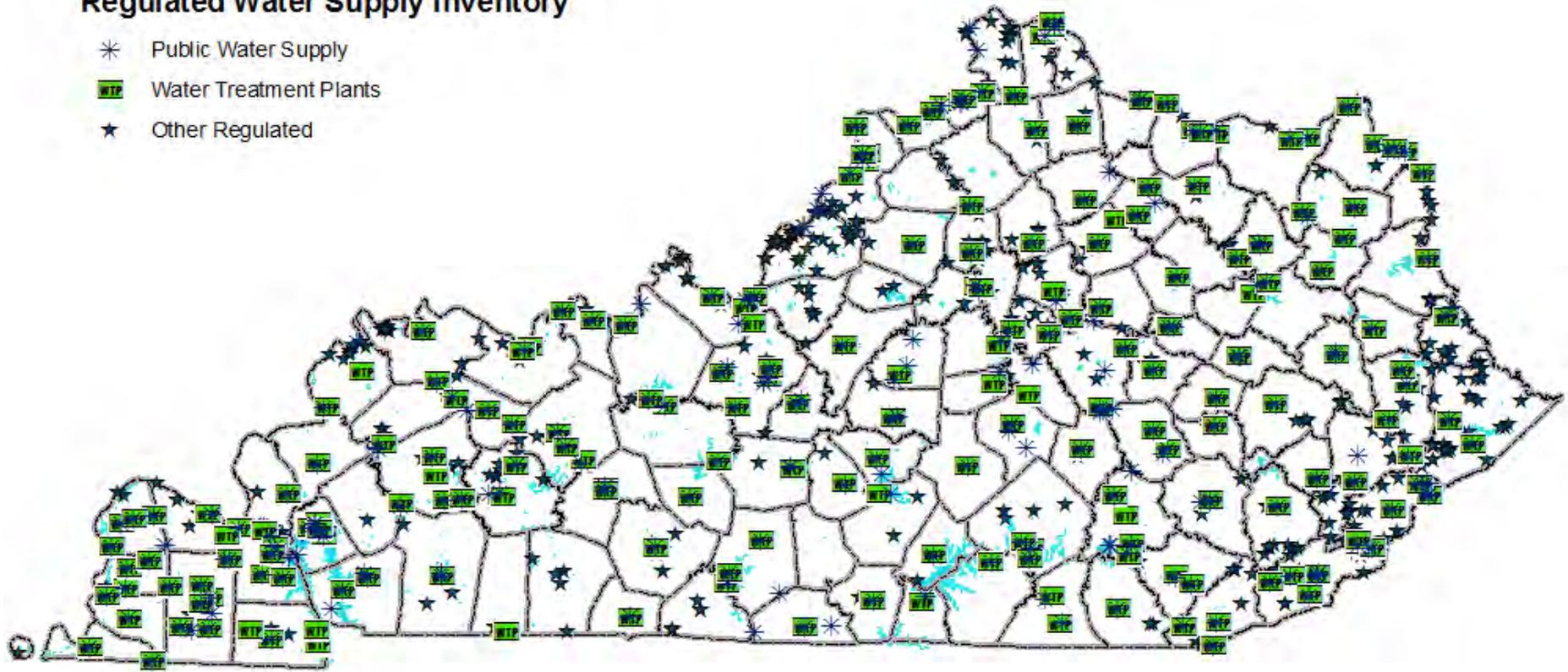
## County\_Cattle\_Numbers

### COW\_TOT



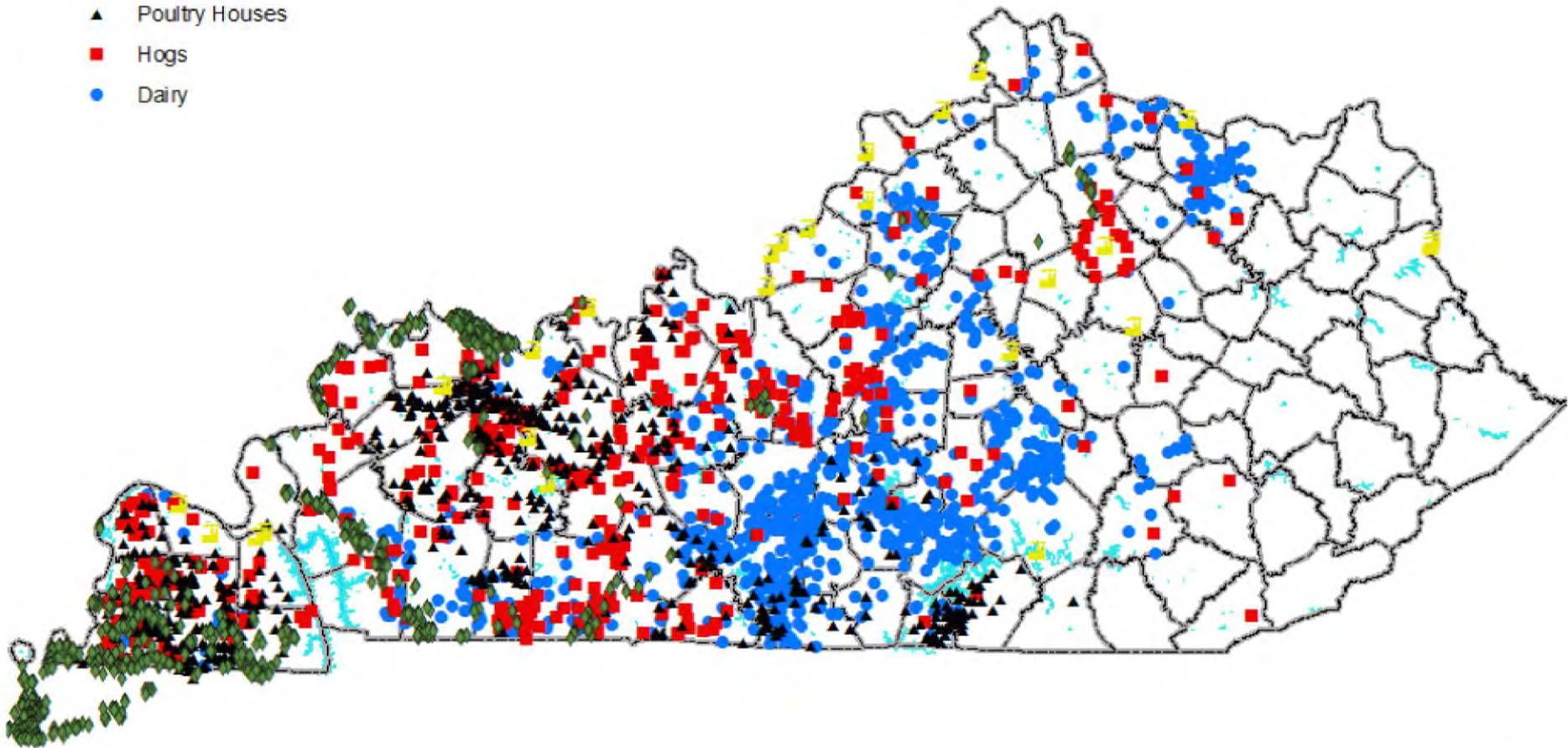
## Regulated Water Supply Inventory

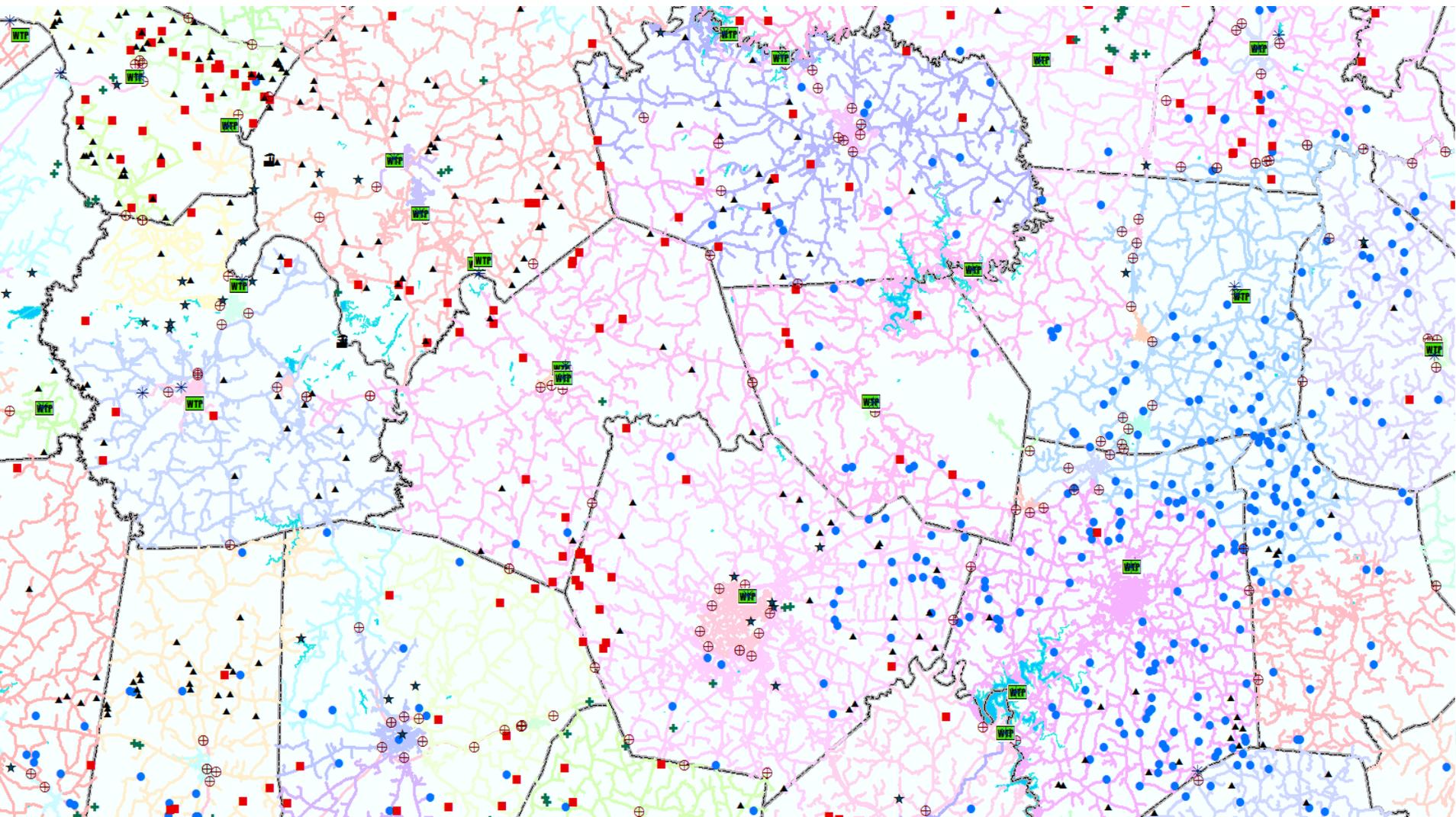
- \* Public Water Supply
- WT Water Treatment Plants
- ★ Other Regulated



## Energy and Agriculture Water Demand

- ◆ Irrigation
- Thermolectric
- ▲ Poultry Houses
- Hogs
- Dairy







U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG<sup>®</sup>

States, local governments and Native American Tribes often have needs in planning for water and related resources of a drainage basin or larger region of a state, for which the Corps of Engineers has expertise.

**Authority and Scope.** Section 22 of the Water Resources Development Act (WRDA) of 1974, as amended, provides authority for the Corps of Engineers to assist the States, local governments, Native American Tribes and other non-Federal entities, in the preparation of comprehensive plans for the development and conservation of water and related land resources.

**Program Development.** The needed planning assistance is determined by the individual States and Tribes. Typical studies are only undertaken at the planning level of detail; they do not include detailed design for project construction. The studies generally involve the analysis of existing data for planning purposes using standard engineering techniques although some data collection is often necessary. Most studies become the basis for State or Tribal and local planning decisions.

**Typical Studies.** The program can encompass many types of studies, dealing with water resources issues. Types of studies conducted in recent years under the program include the following:

- Water Supply and Demand Studies
- Water Quality Studies
- Environmental Conservation/Restoration Studies
- Wetlands Evaluation Studies
- Dam Safety/Failure Studies
- Flood Risk Management Studies
- Flood Plain Management Studies
- Coastal Zone Management/Protection Studies
- Harbor/Port Studies



Fadwood Creek flow capacity study

## Planning Assistance to States



Eau Claire River watershed study for water quality

**Funding.** The Planning Assistance to States program is funded annually by Congress. Federal allotments for each State or Tribe from the nation-wide appropriation are limited to \$2,000,000 annually, but typically are much less. Individual studies, of which there may be more than one per State or Tribe per year, are cost shared on a 50 percent Federal - 50 percent non-Federal basis (may include 100% work in kind).

**How to Request Assistance.** State, local government and Tribal officials who are interested in obtaining planning assistance under this Program can contact the appropriate USACE office for further details. Alternatively, interested parties can contact the appropriate State or Tribal Planning Assistance to States coordinator to request assistance. In either case, USACE will coordinate all requests for assistance with the State or Tribal Planning Assistance to States coordinator to ensure that studies are initiated on State or Tribal prioritized needs.

### Point of Contact for Factsheet:

Maria Wegner-Johnson  
USACE Headquarters  
202-761-5541

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# KENTUCKY WATER RESOURCES MEETING

2 February 2017

Presenter: COL Chris Beck (Louisville Commander)

*"The views, opinions and findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*



**US Army Corps  
of Engineers**



# USACE AUTHORITIES

**COL Chris Beck**  
**Commander (Louisville District)**



**US Army Corps  
of Engineers.**





# Civil Works Business Lines

- **Navigation**
- **Flood and Storm Risk Management**
- **Aquatic Ecosystem Restoration**
- **Watershed Planning**
- **Emergency Management**
- **Regulatory Program**
- *Hydropower*
- *Recreation*
- *Water Supply*



US Army Corps  
of Engineers.



# Key Policy & Laws

## **Flood Control & WRDA**

- 1936 FCA – benefits exceed costs (benefit cost ratios)
- 1986 WRDA – cost sharing required for most projects
- 2016 WIIN – Water Infrastructure Improvements for the Nation

## **Laws, Statutes and Executive Orders**

- National Environmental Policy Act
- Clean Water Act
- National Historic Preservation Act
- EO 11988 – Flood Plain Management
- Endangered Species Act



US Army Corps  
of Engineers.



# Continuing Authorities Overview

Authority	Description	Per Project Cost Limit (\$M)	Per Program Cost Limit (\$M)
Section 14	Emergency Streambank Stabilization	5	20
Section 107	Navigation	10	50
Section 205	Flood Risk Management	10	55
Section 208	Flood Snagging/Clearing	0.5	7.5
Section 206	Aquatic Ecosystem Restoration	10	40
Section 1135	Ecosystem Restoration	10	25



US Army Corps  
of Engineers.



# Other Programs & Authorities

- Planning Assistance to States (Section 22)  
Can be used to provide technical or planning assistance on just about ANYTHING



- Flood Plain Management Services Program
- Emergency Management (PL 84-99)
- Environmental Infrastructure (Section 219 & 531)



# Kentucky Silver Jackets

- Numerous Agencies
- Meets ~ every 6 weeks
- Share/leverage information resources



# Questions?



**US Army Corps  
of Engineers.**



# REGULATORY UPDATE

**Lee Anne Devine**  
**Chief, Regulatory (Louisville District)**



**US Army Corps  
of Engineers.**



# Regulatory Program Goals & Authorities

## ➤ Goals:

- Protect the Nation's aquatic resources while allowing reasonable development
- Fair, flexible and balanced decisions

## ➤ Authorities:

- Section 10 of the Rivers and Harbors Act of 1899
  - Regulate structure or work on navigable waters – maintain navigable capacity
- Section 404 of the Clean Water Act
  - Regulate discharge of dredged or fill material into “waters of the U.S.” - maintain physical, chemical and biological integrity of our nation's waters



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# Regulatory Program Goals & Authorities

- Applications Include: Industrial Developments; Subdivisions; Water and Sewer Infrastructure; “Mom and Pop” Projects; River Facilities; Farming Activities; Roads; Marinas; Coal Mining Proposals, etc.
  - Pre-application Meetings -
    - Discuss alternatives, review process, timelines
    - Investigate qualification for Exemptions
      - Farming Exemptions –
        - Construction/ Maintenance of farm or stock ponds and farm roads; Normal ongoing farming and silvicultural activities
  - Site Visits
    - Determine jurisdiction
  - Public Interest Review
    - Special Conditions - Hours of Operation, Endangered Species, Historic Properties, Mitigation
- Work to get to YES



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# Our Value to Kentucky

- Partnership with KY Transportation Cabinet (KYTC)
  - Developed a Memorandum of Agreement - Spring 2016
    - Fund 3 Positions through Section 214 of WRDA
      - Focus on Projects and Priorities specified by KYTC
      - More timely decisions
      - Develop better working relationships
  
- Partnership with Kentucky Department of Fish and Wildlife Resources
  - In Lieu Fee Program - Established in 2002; Updated in 2011
    - One of first across the country that was compliant with the 2008 Mitigation Rule
    - Great asset to the Commonwealth – provides mitigation opportunities for development projects
    - Outstanding partners in mitigation needs across the Commonwealth



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# Status of Major Initiatives

- Waters of the United States
  - Clean Water Rule – Issued - June 2015/Stay - Oct 2015
  - April 2017 - Supreme Court to hear – District vs Circuit Court Decision
  - Did potentially increase the amount of isolated waters and wetlands that would be jurisdictional
  
- 2017 Nationwide Permits – Effective March 19, 2017
  
- Coal Permit Requests
  - Developed a Pre-Application process with KDNR, KDOW, USEPA, USACE, USFWS & OSM
    - Meet early to discuss projects to improve communication and coordination on coal applications
    - Eliminate inconsistent requirements from agencies
  - Fill Placement Optimization Process (FPOP)
    - Engineering process developed to minimize impacts
      - Reps from - KDOW, Environmental Group, Coal Companies, Consultant, KDMP, OSM, USACE
      - State of the Art Process



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# Questions?



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# OHIO RIVER BASIN UPDATE

**COL Chris Beck**  
**Commander (Louisville District)**



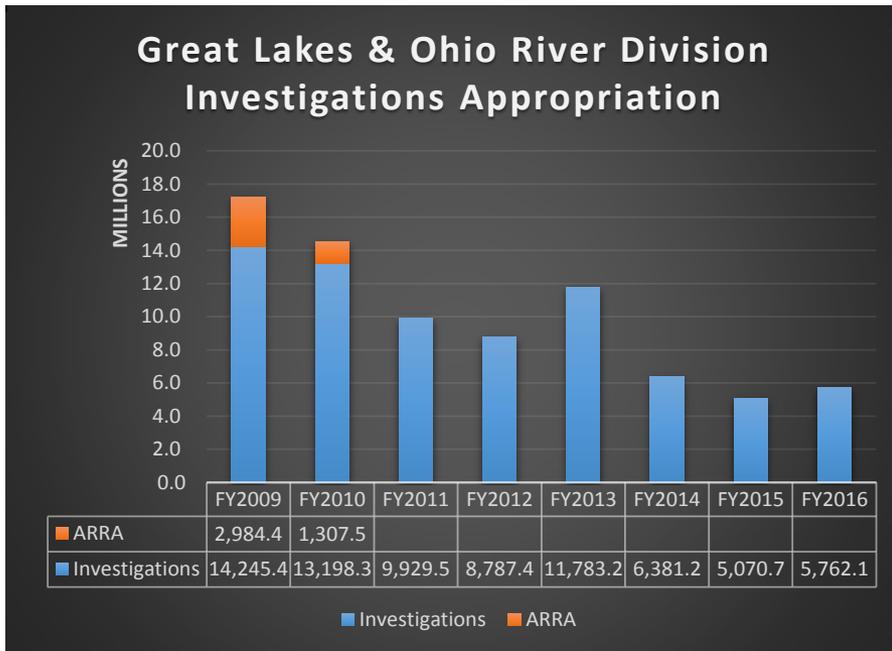
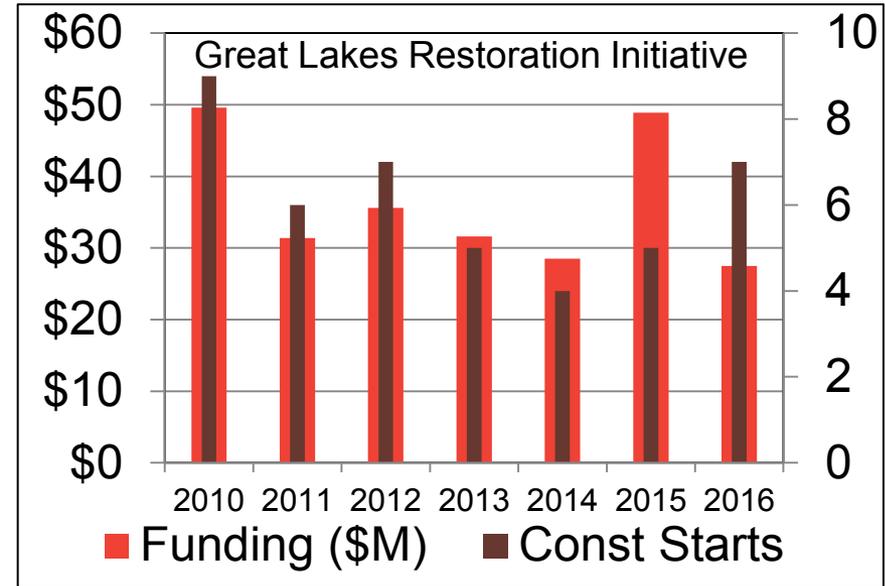
**US Army Corps  
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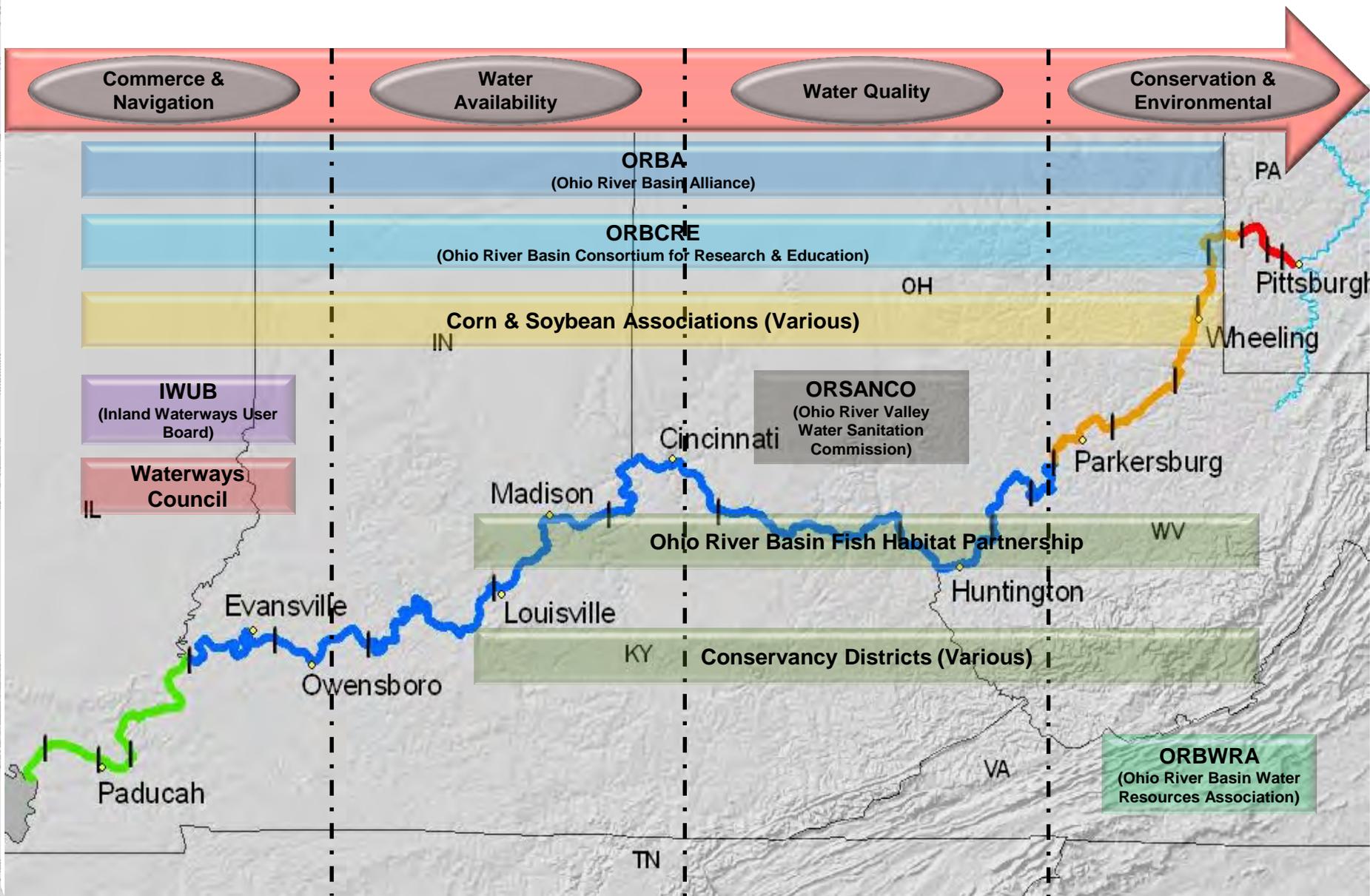
# Overview

- Sustainability of the Ohio River Basin is a collaborative effort among various partners across 14 states
- Ohio River Basin Comprehensive (ORBC) Plan is intended to provide a strategic plan for prioritizing investments in order to efficiently and effectively address water resource related issues in a holistic manner using a watershed approach
- Ultimate goal is to garner interagency cooperation, establish a shared vision and voice within the Basin, collaboratively forecast future conditions and critical needs, identify opportunities to share and leverage resources, prioritize investments to promote a resilient and sustainable future, and implement timely solutions

# Great Lakes Restoration Initiative VS Investigations Funding



# Primary Mission(s)



# 2009 Ohio River Basin Comprehensive Plan

20

- Collaborative effort between Pittsburgh, Huntington, Louisville, and Nashville Districts and numerous local, State, and Federal stakeholders
- Examination of problems, issues, and opportunities and identification of needs
- Evaluation of existing and future conditions
- Formulation of over 100 solutions and recommended actions (not all Corps-related)
- Evaluation using qualitative measures
- Recommendation of 20 actions with emphasis on four priorities
  1. Basin-wide water management
  2. Basin-wide reinvestment strategy
  3. Collaborative and cooperative organization within the Basin
  4. Watershed management and investment plans for all sub-basins
- Development of a Programmatic Management Plan guiding investments within the Basin
- Great ideas, good start ---- need to maintain momentum



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# Basin-Wide Investigations

## Completed:

- Ohio River Navigation Dams Rehabilitation Prioritization Study
- Ohio River Basin Climate Change Adaptation/Mitigation Strategies Pilot Study
- Green River Final Watershed Assessment

## Ongoing:

Licking River Watershed Final Watershed Assessment

## Potential:

- Base Proposal - ORB Forum and GIS Resource Atlas
  - Engage Federal and State agencies and others to establish a stakeholder forum and develop a basin-wide digital atlas (GIS/Google Earth type format), a tool to facilitate access to best available government data and natural and human resources information to support government and private sector investment decisions.
- Option – Risk Assessment and Shared Vision Planning Model for the basin
  - Collaborative identification of threats and vulnerabilities to basin resources and opportunities for gains in Economic Development and Environmental Quality
  - Collaborative Shared Vision Planning Model for basin to manage risks and compare and prioritize investment opportunities



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# Questions?



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# Civil Works Authorities



Planning Assistance to States was used to assist Metro Parks for the master plan for bicycle access along the Louisville Loop in Louisville, KY.



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Louisville District

## General Investigations Studies

### Partnering with the Corps of Engineers to Solve Water Resources Problems

The US. Army Corps of Engineers (USACE) is authorized to conduct investigations related to its core mission areas of navigation, flood risk management, and ecosystem restoration, to determine if Congressional authorization and implementation of a specific Civil Works project are warranted.

The Civil Works feasibility study is an initial step in the USACE's process for addressing many of the nation's significant water resources needs. A feasibility study is used to investigate the Federal interest, engineering feasibility, economic justification and environmental acceptability of a recommended water resources project.

The USACE Civil Works Planning Program conducts a broad range of studies, including studies leading to new projects that require Congressional authorization, studies involving evaluation and design of projects under continuing authorities, and reexaminations of existing projects.

After Congress has both authorized and appropriated funds to begin a study, USACE Planners work with a non-federal sponsor (Sponsor) and multi-disciplinary study teams to identify water resources problems, formulate and evaluate solutions, resolve conflicting interests, and prepare recommendations.

### The Important Role of the Non-Federal Sponsor

USACE feasibility studies are cost-shared with a Sponsor, reflecting our shared responsibility for the nation's water resources. A Sponsor can be a state, tribe, county, city, town, or any other political

USACE at the beginning of a study, may be amended if the study's scope and complexity justifies a higher total cost level. The Sponsor may provide a percentage of the cost-share requirement through work-in-kind (amounts vary based on program authority); some program authorities may require a minimum cash contribution.

- The Design Agreement covers additional PED activities to prepare plans and specifications for construction of a project, after completion of a final feasibility study report that recommends implementation of a specific water resources project.
- The Project Partnership Agreement (PPA) between the Sponsor and USACE covers construction activities once the project has been authorized by Congress and Construction funding has been appropriated.

In addition to the legal and financial capability to fulfill the cost sharing and local cooperation requirements, the Sponsor also agrees to:

- Provide, without cost to the Federal Government, all lands, easements, rights-of-way, relocations and disposal areas (LERRD) necessary for construction, and OMRR&R of a project, including all necessary access routes and utility relocations. The Sponsor cost share for a project includes eligible LERRD credit and cash contributions.
- Comply with provisions of pertinent Federal laws (e.g., National Environmental Policy Act, Endangered Species Act, Clean Water Act, etc.)
- Once the project is completed, it must be maintained and operated without cost to the Federal Government.

## **Floodplain Management Services Program**

### **What the US Army Corps of Engineers Can Do**

The Floodplain Management Services (FPMS) Program provides the full range of technical services and planning guidance that is needed to support effective floodplain management.

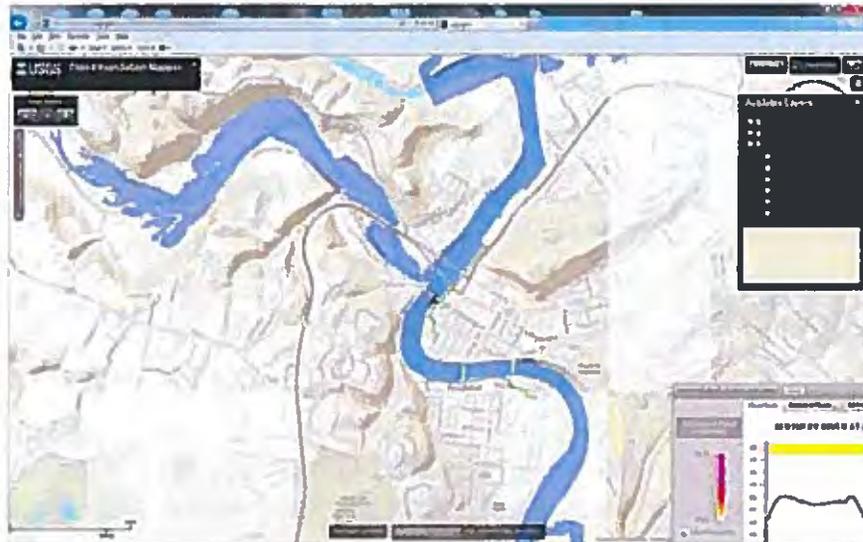
## Types of Assistance

### General Technical Services:

The Program Develops or interprets site-specific data on flooding issues. It also provides information on natural or cultural floodplain resources before and after the use of floodplain management measures

### General Planning Guidance:

On a larger scale, the program provides assistance and guidance in the form of “Special Studies” on all aspects of floodplain management planning, including the possible impacts of off-floodplain land use changes on the physical, socio-economic, and environmental conditions of the floodplain. Special Studies are accomplished at 100% Federal cost. However, funding for these studies is very limited and competitive. See the next page for a chart outlining the different floodplain management services we offer. The program also provides guidance and assistance for meeting standards of the National Flood Insurance Program and for conducting workshops and seminars on nonstructural floodplain management



**Flood inundation mapping efforts can be undertaken under the Floodplain Management Services Program.**

subpart of a state or group of states that has the legal and financial authority and capability to provide the funding and real property requirements needed for a study and a project.

The Sponsor's role begins before a study is initiated, for example, when a local community, or some element of a community, perceives or experiences a water resources problem that is beyond their ability to solve. A community representative, who may represent the possible sponsoring agency, is invited to meet with their local USACE District staff to discuss avenues of assistance, including a feasibility study and potential recommendation for a Federally authorized water resources project.

Before USACE becomes involved in studying a particular water resources problem, two types of Congressional authority are required: study authority and budget appropriations.

A study authority approves the conduct of an investigation to address

In addition to specifically authorized studies, USACE also has numerous programs for which Congress has already provided authorization.

the identified problems. Once a study authority is available, budget appropriations to allow for the expenditure of Federal funds for the study can be provided by Congress (usually in the annual Energy and Water Development Appropriations Act). In certain cases, USACE can provide technical assistance or planning assistance through other authorities or projects without further Congressional authorization.

If there is no available study authority, community representatives may contact their Congressional delegation to request a new study authority and may also submit a proposal for Congressional consideration via the Assistant Secretary of the Army's Annual Report to Congress on Future Water Resources Development.

Once an appropriate study authority is available, USACE will follow the normal Federal budgetary process to request Federal funding. Once budget appropriations are available, the study may begin.

## **What is the Sponsor's Role on the Project Team?**

The Sponsor is a study partner and plays many roles during project development. The Sponsor:

- Helps define the water resources problem(s) and opportunities, study scope, tasks, cost estimates and schedules.
- Participates in study decisions, including the type and mix of study objectives, and contributes to the development and evaluation of alternatives and selection of an alternative plan.
- Communicates with the community about study proposals and assists with public communications about a potential project.
- Contributes to project design, including environmental and aesthetic features, and ensures that, to the extent possible, other factors that affect sponsoring communities are addressed during the planning process.

### **Outline of Steps to Completion of a Civil Works Project:**

1. Sponsor Problem Identification
2. Congress Establishes Study Resolution or Authority
3. Congress Appropriates Study Funding
4. Corps/Sponsor Conducts Feasibility Study
5. Administration Review
6. Congressional Authorization of Project
7. Preconstruction, Engineering and Design
8. Congress Appropriates Construction Funding
9. Construction
10. Sponsor Operations, Maintenance, Repair, Replacement, and Rehabilitation (OMRR&R)

## **What are the Sponsor's Obligations?**

A Sponsor must contribute 50 percent of feasibility study costs plus 25-35 percent of Preconstruction, Engineering and Design (PED) costs. The Sponsor and USACE sign three agreements over the course of the project development and construction:

- The Feasibility Cost Sharing Agreement (FCSA) must be signed before the feasibility study can begin. A model FCSA for a \$3 million total study cost, signed by the Sponsor and

measures, such as flood proofing and relocation of structures from the floodplain.

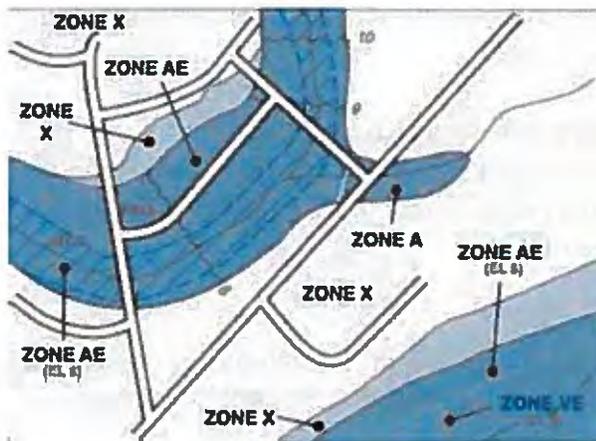
#### Guides, Pamphlets, and Supporting Studies:

Studies are conducted under the program to improve the methods and procedures for mitigating flood damages. Guides and pamphlets also are prepared on flood proofing techniques, floodplain regulation, floodplain occupancy, natural floodplain resources, and other related aspects of floodplain management

#### Cost Sharing Information

Program services are provided to state and local governments, other non-Federal public agencies without charge based on available funding. Voluntary contribution of funds by States, Local Governments, and Native American Tribes for the purposes of expanding the scope of services requested under Floodplain Management Services is also allowed.

Program services also are offered to non-water resource Federal agencies and to the private sector on a 100-percent cost recovery basis. For most of these requests, payment is required before ser-



VICES are provided. A schedule of charges is used to recover the cost of services taking up to one day to provide. Letter requests or signed agreements are used to charge for those that take longer.

**Existing floodplain maps, including Flood Insurance Rate Maps can be reviewed and analyzed under the Floodplain Management Services Program.**

## **Floodplain Management Services Offered**

### **Flood Damage Mitigation Study**

A study of flooding problems within a community with recommendations of measures to alleviate flooding or reduce damages.

### **Elevation Reference Mark Database**

This could include reference elevations for community planning purposes or for use by individuals.

### **Flood Warning or Preparedness Study**

This may include a report or the design of a warning system and emergency evacuation plan based on river stages and rates of rise.

### **Flood Control Planning Database**

A state-wide inventory of all flood control structures and specific information about each.

### **Stormwater Management Study**

Analysis of flooding problems caused by inadequate stormwater drainage and recommend improvements. Dam Failure Analysis Model and prepare maps showing the effects of a dam failure using a 3-dimensional flow model.

### **Special Flood Hazard Information Report**

Delineate the 100-year or other frequency floodplain and/or floodway. A local community could submit this report to FEMA to extend or revise FIS floodplains.

### **Urbanization Analysis**

This could look at the effects of watershed development on flood flows and floodplain boundaries. This may be used by a community to set development policy.

### **GIS Floodplain Maps**

Mapping of floodplains using Geographic Information System.

**HEC-1 and HEC-2 Workshops**

Conduct Workshops on HEC-1 (hydrologic) and HEC-2 (stream profile) computer models.

**Floodplain Delineation/Inundation Maps**

Showing areas flooded at various river stages. This could be used for emergency planning or to set floodplain development policies.

**Floodproofing Workshops**

Conduct workshops on floodproofing methods for existing buildings located in floodplains.

**Community Flood Zone Database:**

This could contain flood zone information of properties and structures located within designated floodplains.

**Community Rating System Support**

Assistance in qualifying for and preparing applications for FEMA's Community Rating System. This may include several of the above items as well as design of floodproofing for repetitive loss structures.

**Emergency Streambank and Shoreline Stabilization Section 14, 1946 Flood Control Act****What the US Army Corps of Engineers Can Do**

The US Army Corps of Engineers is authorized to construct bank protection works to protect vital public facilities that are being threatened by streambank erosion. Some examples of the types of facilities that are eligible for protection are public buildings, roads, sewage treatment plants, municipal water supply systems, non-profit schools and hospitals, bridges, etc. Private property, facilities, or vacant lands are NOT eligible for protection under this authority. In addition the erosion protection must be more cost effective than relocating the facility.

## Study Process

Before the Federal Government can participate in implementing a flood risk management project, a planning study must be conducted to determine if the project is economically justified (benefits exceed the costs), technically feasible, and environmentally acceptable.



## Cost Sharing Information

Initial study is 100% federally funded up to \$100,000. The remainder of the study phase is cost shared 50% Federal and 50% non-Federal. The sponsor must contribute 35 percent of the total project design and construction cost as cash, in-kind services or Lands, Easements, Rights-of-way, Relocations, and Dis-

**Pre-Project Condition**



**Post-Project Condition**

posal areas (LERRDs). Each project is limited to a Federal Cost of no more than \$5 million. The national program limit for these projects is \$20 million per year.

## Project Sponsor Responsibility

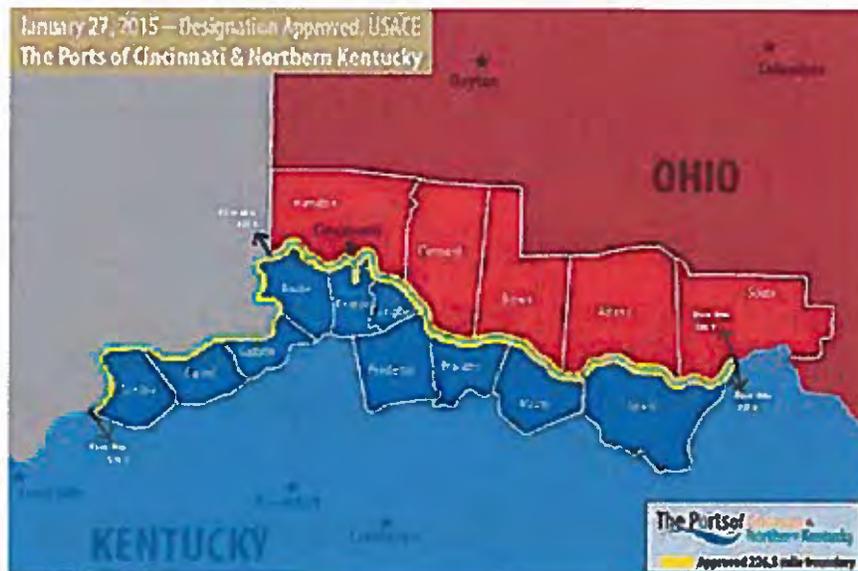
A Feasibility Cost Sharing Agreement (FCSA) must be executed for studies in excess of \$100,000. Formal assurance in the form of a Project Partnership Agreement must be executed with the project sponsor. The Corps of Engineers would oversee project construc-

tion; however, once constructed, the operation and maintenance of the project would be the responsibility of the project sponsor.

## Planning Assistance to States Section 22, 1974 Flood Control Act

### What the US Army Corps of Engineers Can Do

Every year, each State, local government, or other non-Federal entity can provide the Corps of Engineers its request for studies under the program, and the Corps of Engineers then accommodates as many studies as possible within the funding allotment. Typical studies are only planning level of detail; they do not include detailed design for project construction. The studies generally involve analysis of existing data for planning purposes, using standard engineering techniques, although some data collection is often necessary. Most studies become the basis for State, and local planning



**Planning Assistance to States was used for a statistical boundary redesignation for the Port of Cincinnati to encompass facilities along the Ohio River in Ohio and Kentucky.**

decisions. Congress funds the Planning Assistance to States (PAS) Program annually. Federal allotments for each State or Tribe from the nationwide appropriation are limited to \$5 million annually, but typically are much less. Individual studies, of which there may be more than one per state each year, generally range in cost from \$35,000 to over \$100,000.

### Study Process

Typical Studies encompass many types of studies dealing with water and related land resources issues. Types of studies conducted in recent years under the program include the following:

Water Supply and Demand Water Quality	Navigation
Environmental Conservation and/or Restoration	Recreational Master Planning
Dam Safety	GIS Development
Flood Risk and/or Floodplain Management	Engineering Analysis
Land Use	Drainage analysis
Master Planning	Erosion and Sedimentation
Brownfield Assessment	

### Cost Sharing Information

PAS Studies are cost shared on a 50% Federal, 50% non-Federal basis. The non-Federal cost share may be made up of cash, in-kind services, or a mixture of both.

## Small Flood Risk Management Projects Section 205, 1948 Flood Control Act

### What the U.S. Army Corps of Engineers Can Do

The Small Flood Risk Management Project program provides local flood risk management by the construction or site specific. Typical

flood risk management projects may include levees, floodwalls, impoundments, pumping stations, and channel modifications as well as non-structural measures. Non-structural measures reduce flood damages by changing the use of floodplains or by accommodating existing uses to the flood hazard. Examples include flood proofing, relocation of structures, and flood warning and preparedness systems. The US Army Corps of Engineers oversees planning, design, and construction of flood risk management projects in close coordination with the project sponsor.



**The Feather Creek Project in Clinton, Indiana reaped benefits before project completion as seen in the top photograph.**

### Study Process

Before the Federal Government can participate in implementing a flood risk management project, a planning study must be conducted to determine if the project is economically justified (benefits exceed the costs), technically feasible, and environmentally acceptable.

## **Cost Sharing Information**

Initial study is 100% federally funded up to \$100,000. The remainder of the study phase is cost shared 50% Federal and 50% non-Federal. The sponsor must contribute 35 percent (minimum 5 percent cash) of the total project design and construction cost as cash, in-kind services or Lands, Easements, Rights-of-way, Relocations, and Disposal areas (LERRDs). Each project is limited to a Federal Cost of no more than \$10 million. The national program limit for these projects is \$55 million per year.

## **Project Sponsor Responsibility**

A Feasibility Cost Sharing Agreement (FCSA) must be executed for studies in excess of \$100,000. Formal assurance in the form of a Project Partnership Agreement must be executed with the project sponsor. The Corps of Engineers would oversee project construction; however, once constructed, the operation and maintenance of the project would be the responsibility of the project sponsor.

## **Aquatic Ecosystem Restoration Section 206, 1996 Water Resources Development Act**

### **What the US Army Corps of Engineers Can Do**

Section 206 of the 1996 Water Resources Development Act allows the US Army Corps of Engineers to carry out aquatic ecosystem restoration and protection projects. Projects typically involve environmental restoration of aquatic and floodplain areas including creation/restoration of wetlands and riparian areas, as well as small dam removal. Other types of projects include providing water management, planting of hardwood trees or native grasses, and other types of restoration to improve and enrich aquatic habitat. Limited recreational features can also be included in the project, provided they are compatible with the ecosystems outputs of the project.



**Pre-Project Condition**



**Post-Project Condition**

### **Study Process**

Before the Federal Government can participate in implementing Section 206 project, a planning study must be conducted to determine if the project is economically justified (benefits exceed the costs), technically feasible, and environmentally acceptable.

### **Cost Sharing Information**

Initial study is 100% federally funded up to \$100,000. The remainder of the study phase is cost shared 50% Federal and 50% non-Federal. The design and implementation of the project are cost shared on a 65% federal, 35% non-Federal basis. The non-Federal portion may be made up of a mixture of cash, in-kind contri-

butions, and Lands, Easements, Rights-of-way, Relocations, and Disposal areas (LERRDs). Each project is limited to a Federal Cost of no more than \$10 million, and the national program limit for these projects is \$40 million per year.

### **Project Sponsor Responsibility**

The local sponsor is responsible for provision of the LERRDs necessary for the project. A Feasibility Cost Sharing Agreement (FCSA) must be executed for studies in excess of \$100,000. Formal assurance in the form of a Project Partnership Agreement must be executed with the project sponsor. The Corps of Engineers would oversee project construction; however, once constructed, the operation and maintenance of the project would be the responsibility of the project sponsor.

## **Project Modification for Improvements to the Environment Section 1135, 1986 Water Resources Development Act**

### **What the US Army Corps of Engineers Can Do**

This authority provides for the review and modification of structures and operations of water resources projects constructed by the Corps for the purpose of improving the quality of the environment when it is determined that such modifications are feasible, consistent with the authorized project purposes, and will improve the quality of the environment in the public interest. In addition, if it is determined that a Corps water resources project has contributed to the degradation of the quality of the environment, restoration measures may be implemented at the project site or at other locations that have been affected by the construction or operation of the project, if such measures do not conflict with the authorized project purposes.

### **Study Process**

Before the Federal Government can participate in implementing Section 1135 project, a planning study must be conducted to de-

termine if the project is economically justified (benefits exceed the costs), technically feasible, and environmentally acceptable.

### **Cost Sharing Information**

Initial study is 100% federally funded up to \$100,000. The remainder of the study phase is cost shared 50% Federal and 50% non-Federal. The design and implementation of the project are cost shared on a 75% federal, 25% non-Federal basis. The non-Federal portion may be made up of a mixture of cash, in-kind contributions, and Lands, Easements, Rights-of-way, Relocations, and Disposal areas (LERRDs). Each project is limited to a Federal Cost of no more than \$10,000,000, and the national program limit for these projects is \$25,000,000 per year.

### **Project Sponsor Responsibility**

The local sponsor is responsible for provision of the LERRDs necessary for the project. A Feasibility Cost Sharing Agreement (FCSA) must be executed for studies in excess of \$100,000. Formal assurance in the form of a Project Partnership Agreement must be executed with the project sponsor. The Corps of Engineers would oversee project construction; however, once constructed, the operation and maintenance of the project would be the responsibility of the project sponsor.



## Civil Works Authorities at a

Authority	Description
Section 14	Emergency Streambank Stabilization
Section 107	Navigation
Section 205	Flood Risk Management
Section 208	Flood Snagging/Clearing
Section 206	Aquatic Ecosystem Restoration
Section 1135	Ecosystem Restoration

Unless otherwise noted, cost sharing is 65% federal, 35% non-federal.

- Section 14 – Emergency erosion protection for public facilities and utilities (roads, bridges, sewers, schools, etc.)
- Section 107 – Small navigation projects (boat harbors, etc.). Cost sharing varies.
- Section 205 – Small flood risk management projects (levees, floodwalls, channel widening, etc.)
- Section 208 – Clearing and snagging for flood risk management (logjam removal)
- Section 206 – Aquatic environmental restoration (wetland creation, stream restoration, etc.)
- Section 1135 – Modifications of Corps projects for ecosystem restoration purposes. 75/25 cost share.

## Glance:

Per Project Cost Limit (\$M)	Per Program Cost Limit (\$M)
5	20
10	50
10	55
0.5	7.5
10	40
10	25



**Partnering agency members discuss Aquatic Ecosystem Restoration in the Green River area.**

## Requesting Assistance and Information

An investigation of a prospective project under any of the civil works authorities can be initiated upon receipt of a request from a sponsoring agency empowered under State law to provide local partnership.

### For additional information:

Brandon R. Brummett, P.E., PMP  
US Army Corps of Engineers Louisville District  
Outreach Coordinator  
502-315-6883  
[brandon.r.brummett@usace.army.mil](mailto:brandon.r.brummett@usace.army.mil)



**This streambank protection project along the Ohio River at Mill Creek is an example of Emergency Streambank stabilization under Section 14.**



**Kentucky Farm Bureau Water Management Work Group**  
**Recommendations for Consideration**

**The Work Group feels these recommendations should be prioritized and coordinated to ensure water issues are undertaken in a productive and well-timed manner, understanding all are important and funding opportunities may influence timing of successful implementation.**

**1. Monitoring:**

- A. Monitoring and tracking of water resources – surface water, aquifer, springs, ponds, and lakes.
  - I. Continued support and funding for the Data Management and Integration Portal for water resources data maintained by KY USGS.
  - II. Support development of additional “super gauges” for water quality monitoring on KY and Salt Rivers by USGS as part of Kentucky’s nutrient reduction strategy.
- B. Develop a statewide water resources network for comprehensive monitoring of water resources. Coordinate the location of future sites, both surface and groundwater, in relation to existing and new monitoring sites.
  - I. Continued support to expand the KY Groundwater Monitoring Network by KGS.
    - a. Secure funding for additional monitor wells, data-collection equipment and operational costs.
- C. Develop an “early warning system” of low soil moisture and drought conditions that impact farming and identify any viable system that can be useful to producers.
- D. Continued expansion of the 66 Kentucky Mesonet sites into more counties and across state boundaries that impact Kentucky weather events.
  - I. Connect groundwater monitoring data and Kentucky Mesonet data into an effective water budget by county or region (similar to Pennsylvania system).
  - II. Evaluate the need for additional scientific instrumentation to enhance value of data collected from Mesonet sites.
  - III. Development of a phone app (similar to Oklahoma) with Mesonet data.
  - IV. Explore possibility of project funding for Mesonet sites in communities that may not have the resources to support a critical site. Support continued efforts of the Kentucky Ag Development funds to expand the Mesonet Network. (Possibly matching local funds with Kentucky Ag Development funds).
- E. Continued expansion beyond the ten Mesonet stations that have soil moisture and soil temperature sensors.
- F. Support adequate funding for Kentucky Mesonet operational cost.
- G. Identify better, more comprehensive ways to track, monitor, and report early onset of low soil moisture conditions to augment the computerized models that provide the soil moisture conditions in specific regions across Kentucky.

H. (Development of Regional Water Budget Model – Sensor Wise Irrigation Monitoring (SWIM) Network).

**2. Analysis of Water Use and Information Needs:**

- A. Develop an accurate determination of water use for crop and livestock production on municipal systems.
- B. Support comprehensive rural water system source assessment, diversification and planning to determine capacities of rural water systems and assess their vulnerabilities during low flow or drought events.
- C. Project future needs or potential increases in agricultural water uses for expanded crop opportunities.
- D. Identify potential conflicts and resolutions of water use between users upstream and downstream, nearby domestic or public supplies, recreational, and industrial uses.
- E. Review and make recommendations to improve water laws, policies and drought plans. (Water Jurisdiction Issues)
- F. Understand the capacity of rural and urban water supplies and their vulnerability during low water flow or drought conditions to meet demand.
- G. Increase public awareness of the importance of our water resources to our agricultural production capacity and to our economic development potential.
- H. Develop a survey to explore what type of information the farming community finds useful relative to weather and water use understanding producers may have different informational needs at different times of the year.
- I. Encourage local citizen, landowners, and agriculture producers to participate in local "Source Water Protection Programs."

**3. Water Resource Development and Technical Assistance:**

- A. Develop and/or improve best management practices to improve water efficiency (increase technical assistance from multiple agencies).
  - I. Explore and support research into crop breeding programs to enhance development of major crop varieties that are more water-use efficient.
  - II. Promote soil health practices to increase water holding capacity and the importance of organic matter relative to water resource management.
  - III. Coordinate efforts to define and plan research and demonstration irrigation projects at the UK Grain & Forage Center for Excellence.
    - a. Irrigation efficiency assistance (similar to energy efficiency programs currently available), drip irrigation or irrigation injection system development.
    - b. Development of effective water trapping, harvesting or alternative water storage systems (retrofitting tile drainage systems, backflow systems, etc.)
  - IV. Develop surface water resources to capture water during winter and spring months for use during drought – runoff water to be recycled back to irrigate crops.

- V. Retrofitting tile drainage to possibly capture runoff water to be recycled as an irrigation resource. Identify and enhance all BMPs for their water management benefits.
  - VI. Identify funding for demonstration pilot projects or practices on innovative water management practices to trap, hold and better utilize water on the farm.
- B. Explore infrastructure improvements at some of the roughly 200 P.L. 566 and State Owned Dams to provide pumping stations and greater access during state drought declarations.
- C. Increase access to technical expertise assistance and funding in water development for farm use.
- I. Evaluate changes to Agricultural Development Fund, state cost share programs and CAIP projects to allow funding for new and innovative water resource development projects. Support continued efforts in CAIP to assist individual producers demonstrate water efficiencies and recommend establishment of a new state level program specifically for water management assistance.
  - II. Work with Congressional delegation on farm bill proposals to address changes needed to allow technical assistance in the initial development of water resources to demonstrate on-farm water resource development.
    - a. Allow NRCS to provide financial assistance through EQIP for the "best" alternative (vs. least-cost) for the identified resource concern. Develop criteria for determining "best" and sustainable alternative water source.
    - b. Allow NRCS to provide financial assistance through EQIP for new irrigation systems providing that parameters are developed, such as:
      - i. Consistent drought locations (number of years in documented drought status)
      - ii. Cap on dollars
      - iii. State or area must have baseline aquifer data available
      - iv. Require collection and usage reports to avoid aquifer drawdown or depletion
- D. Developing "water harvesting" technologies and/or best management practices to enhance water management and evaluate initial installation costs. Support continued programs that enhance on-farm water storage, assist with water development, and assist during droughts with pond clean-out like ECP.
- E. Establish an "Agricultural Water Resources Development Academy."

**4. Drought Mitigation Plan and Response:**

- A. Update the KY Drought Mitigation Plan and fund development of the NOAA Drought Early Warning System for Kentucky as part of that plan update.

- B. Strengthen the agriculture section of the Drought Mitigation Plan and expand on those things envisioned in the Plan.
  - I. Two main elements, the monitoring/response and the mitigation/risk reduction.
  - II. Baseline forecasting for future water needs and where Kentucky wants to be relative to water resources.
- C. Familiarize agencies with their roles as identified in the Drought Mitigation Plan.
- D. Document these conditions to appropriate USDA and state agencies to ensure timely emergency declarations and assistance.
- E. Define the specific problems that are most often encountered during drought and recommend viable solutions.
- F. Identify multiple ways that agriculture drought preparedness/response could be improved from impact assessments, climate/soil monitoring, financial assistance, on-farm water management projects etc. (a good plan has to have additional input and be organized and prioritized).
- G. Reduce financial impact of drought on agriculture- Corn crop yields varied from 68 bu/ac to 170 bu/ac over the past 15 years according to NASS. At \$4/bu that is a spread of \$408/a. variance.

**5. Communications & Outreach:**

- A. Assist public water systems with community drought preparation planning and source water protection programs.
- B. Develop effective proactive communication and outreach campaigns to educate water users about the urban/rural interface and how water resources would be impacted under serious drought conditions.
  - I. Promote the current effort to identify and develop additional water resources that will complement municipal and rural water resources.
  - II. Address the importance of agriculture and define how agriculture's water needs would be addressed under various drought scenarios.
  - III. Develop and communicate water-use conservation recommendations that both urban and rural water users can utilize.
- C. Encourage development of a Kentucky comprehensive water management plan.

**6. Water Resources Development Act**

- A. Utilize authorizations passed by Congress in the Water Resources Development Act of 2016 (WRDA) to enhance water resources in Kentucky.