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Integrated Water Resources Science and Services (IWRSS) is supported by a consortium consisting of U.S. Geological Survey (USGS), the U.S. Army Corps of Engineers (USACE), and the National Oceanic and Atmospheric Administration (NOAA) (the "IWRSS partner agencies"). These agencies are collaborating to design, develop and implement a national water modeling and information services framework to:

- 1) Infuse new hydrologic science into current water resource management;
- 2) Develop hydrologic techniques and information to support operational water resources decisions; and
- 3) Provide advanced hydrologic services to meet stakeholder needs.

We are currently looking for opportunities to develop and demonstrate IWRSS. That's why we need your participation in this effort! We need your expertise and advice so we can design and deliver practical, useful and high-value services. The purpose of this survey is to provide an opportunity for you to articulate and prioritize your water resources information needs, describe barriers you experience to obtaining useful information, and identify the potential benefits of filling your information gaps. Results of the survey will drive future investment in information and services provided by IWRSS.

As a stakeholder in the **[RIVER BASIN]** River Basin, you have valuable insight into the key issues and decisions facing the region, as well as the types of information you need. We ask that you base your answers on your own experience, expertise, and/or role in your organization.

Your responses to this survey will be kept anonymous and any published results of the survey will be summarized in a manner that does not allow identification of individuals. Public reporting burden for this collection of information is estimated to average 25 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other suggestions for reducing this burden to Mary Mullusky, NOAA National Weather Service, 1325 East-West Highway, SSMC2 Rm. 13426, Silver Spring, MD 20910.

Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subjected to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

Survey and Navigational Instructions

Move forward or backward one page at a time by clicking on the Next Page or Previous Page buttons. (DO NOT use your browser's Back or Forward buttons.)

Move from field to field by either clicking with your mouse or using the Tab key.

Use the pop-up explanation boxes. Phrases in blue font have explanatory pop-ups associated with them. Mouse over the blue type and you should see a box with information that could help you answer the question.

If you have any questions during the survey, you can email ERG from any page using the link in the bottom corner.

1) From the following list, please select the PRIMARY sector in which your work or interest is focused in the [RIVER BASIN] River basin? (Check one)

- Water Quality
- Hydropower
- Fish and Wildlife
- Other Energy Extraction
- Emergency Management
- River Commerce
- Reservoir Management
- Municipal and Industrial Water Supply
- Watershed Management
- Recreation
- Agriculture
- Other (please specify)

[For the Ohio River Basin]

- Insurance
- Flood protection

[For the Russian River Basin]

- Education
- Legislative

2) Please indicate any other sectors in which you work or that you are concerned about in the [RIVER BASIN] River basin? (Please check all that apply)

- Water Quality
- Hydropower
- Fish and Wildlife
- Other Energy Extraction
- Emergency Management
- River Commerce
- Reservoir Management
- Municipal and Industrial Water Supply
- Watershed Management
- Recreation
- Agriculture
- Other (please specify)

[For the Ohio River Basin]

- Insurance
- Flood protection

[For the Russian River Basin]

- Education

Legislative

3) Please select the affiliation that best describes your work or interest in the [RIVER BASIN] River basin? (Check one)

- Federal Government
- State Government
- Local Government
- Industry/Business
- Non-Profit Organization
- Academic
- Private Citizen

4) How many years have you been working on or interested in issues in the [RIVER BASIN] River basin?

- Less than 5 years
- 5 - 10 years
- 11 - 15 years
- More than 15 years

5) How many years have you been interested in issues related to water resources management?

- Less than 5 years
- 5 - 10 years
- 11 - 15 years
- More than 15 years

6) How frequently do you deal with issues related to water resources management?

- Daily
- Weekly
- Monthly
- Less than once a month

7) Do your job responsibilities include providing input to strategic planning; program, facility, operations or financial management; or project planning decisions on water resources information?

- Yes, my job responsibilities include at least one of these tasks
- No, my job responsibilities do not include any of these tasks

II. Priorities.

For the purposes of this survey, we are using, as a starting point, the water resources priorities identified by the [RIVER BASIN]. The list of priorities, with examples of each is provided below.

8) How important are each of the following issues? (Please indicate the importance (to you) of each the following issues on a scale from 1 to 5; where 1 is "Not Important at All" and 5 is "Extremely Important.")

	Not important at all 1	Slightly important 2	Important 3	Moderately important 4	Extremely important 5
Flooding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drought	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water availability and use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fisheries and aquatic habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9) If you selected "Other" above, please use this space to describe your priority water resources issue.

10) Looking at the issues as a group, please rank the three most important issues that you think are facing the [RIVER BASIN] River Basin, in order of importance; where 1 is the most important issue.

III. Information Needs.

Next, we would like to ask you about the types of information you need to make decisions about the issue you ranked as your top priority issue.

We would like to focus on four categories of information provided by IWRSS partner agencies:

- > Observations: Data collected using scientific instruments. Examples include meteorological observations such as air temperature, dew point, and precipitation and surface hydrology observations such as river stage/discharge/streamflow, river velocity, and soil moisture.
- > Forecasts: Meteorological, climatological, and hydrologic information for future times at given locations derived from a model. Examples include meteorological forecasts of atmospheric pressure, atmospheric freezing levels, and wind speed and surface hydrology forecasts of river discharge/streamflow, river stage/elevation, and river velocity.

- > Uncertainty: Quantification of uncertainty that arises from several sources, including model structure, parameters, initial conditions, and data used to drive and evaluate the model. For example, the probability of exceeding a flood level quantifies the model and data uncertainty for a river level forecast at a given time and location.
- > Analyses: Public alerts, guidance, estimates, maps, and information derived from the evaluation and integration of meteorological, hydrologic, climatological data, and models.

In the previous section, you indicated that your highest priority issue is:

[Insert highest priority issue from question 8.]

11) For your highest priority issue, describe your access to the following types of information needed for informing decisions.

	I do not need this type of information	I have adequate information to meet my needs	I have the information, but it is not adequate or needs improvement	I need this type of information but currently have no or very limited access to it.
Observations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forecasts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Uncertainty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[In Question 11, if respondent DID NOT select “I do not need this type of information”, for:

- a) Observations then ask: Q12 - Q13,
 - b) Forecasts then ask: Q14 - Q15,
 - c) Uncertainties then ask: Q16 - Q17,
 - d) Analyses then ask: Q18 - Q19;
- Otherwise go to [END].]

Observation Information Details

You indicated that you use or are interested in using observation information for decision making.

12) The observation information that you're interested in supports decision making over what time frames? Please check all that apply.

- Immediate
- 1 day
- 1 to 3 days
- 3 to 5 days

- 5 to 7 days
- 1 week to 1 month
- 1 month to 1 year
- > 1 year
- None of the above

13) How often would you like to see new observation information made available for use?

- Every 15 minutes or less
- 15 minutes to 1 hour
- Hourly
- Daily
- Weekly
- Monthly
- Quarterly
- Annually
- None of the above

Forecast Information Details

You indicated that you use or are interested in using forecast information for decision making.

14) The forecast information that you're interested in supports decision making over what time frames? Please check all that apply.

- Immediate
- 1 day
- 1 to 3 days
- 3 to 5 days
- 5 to 7 days
- 1 week to 1 month
- 1 month to 1 year
- > 1 year
- None of the above

15) How often would you like to see new forecast information made available for use?

- Every 15 minutes or less
- 15 minutes to 1 hour
- Hourly
- Daily
- Weekly
- Monthly
- Quarterly
- Annually
- None of the above

Uncertainty Information Details

You indicated that you use or are interested in using uncertainty information for decision making.

16) The uncertainty information that you're interested in supports decision making over what time frames? Please check all that apply.

- Immediate
- 1 day
- 1 to 3 days
- 3 to 5 days
- 5 to 7 days
- 1 week to 1 month
- 1 month to 1 year
- > 1 year
- None of the above

17) How often would you like to see new uncertainty information made available for use?

- Every 15 minutes or less
- 15 minutes to 1 hour
- Hourly
- Daily
- Weekly
- Monthly
- Quarterly
- Annually
- None of the above

18) Does your organization use a formal mechanism or decision model with uncertainty information?

- Yes, my organization uses a formal mechanism or decision model. [Please describe]
- No, my organization uses a qualitative approach. [Please describe]
- No, my organization does not currently have an approach for using this information. [Please describe]

Analyses Information Details

You indicated that you use or are interested in using analyses information for decision making.

18) The analyses information that you're interested in supports decision making over what time frames? Please check all that apply.

- Immediate
- 1 day
- 1 to 3 days
- 3 to 5 days

- 5 to 7 days
- 1 week to 1 month
- 1 month to 1 year
- > 1 year
- None of the above

19) How often would you like to see new analyses information made available for use?

- Every 15 minutes or less
- 15 minutes to 1 hour
- Hourly
- Daily
- Weekly
- Monthly
- Quarterly
- Annually
- None of the above

[In Question 11, if respondent selected "I have the information, but it is not adequate or needs improvement" or "I need this type of information but currently have no or very limited access to it," for:

- a) Observations then ask: Q20 - Q22,
 - b) Forecasts then ask: Q23 - Q25,
 - c) Uncertainties then ask: Q26 - Q28,
 - d) Analyses then ask: Q29 - Q31;
- Otherwise go to [END].]

Barriers to Use and Benefits Section

20) You indicated that the *observation* information you need for informing decisions needs improvement or is unavailable. What are some of the barriers to using the following types of observation information?

	Not available in a format that I can use	Don't know where to get the information	Accuracy is not sufficient	Consistency is not sufficient	Resolution is not sufficient	Not enough information available	Don't understand how information can be used	I don't use this type of information
Surface hydrology information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Groundwater hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage basin management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meteorology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snow/ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21) If the *observation* information you needed were made available, would you experience any of the following benefits from using the additional or new observational information?

	No, this is not something that I would experience	Yes, this is something that I would experience
Reduced flood damage (property damage, injury or loss of life, lost business, recovery costs)	<input type="checkbox"/>	<input type="checkbox"/>
Reduced drought damage	<input type="checkbox"/>	<input type="checkbox"/>
Improved wastewater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved stormwater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved drinking water supply or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved water quality	<input type="checkbox"/>	<input type="checkbox"/>
Improved navigability (shipping, recreation)	<input type="checkbox"/>	<input type="checkbox"/>
Increased efficiency of hydroelectric power generation	<input type="checkbox"/>	<input type="checkbox"/>
Improved timing of water withdrawals and releases or its management	<input type="checkbox"/>	<input type="checkbox"/>
Improved agricultural practices	<input type="checkbox"/>	<input type="checkbox"/>
Improved endangered/threaten species or fisheries management	<input type="checkbox"/>	<input type="checkbox"/>
Other type of benefit? [Describe on next screen]	<input type="checkbox"/>	<input type="checkbox"/>

If respondent selects “other”, then ask Question #22.

22. If you selected “yes” for “other type of benefit,” please provide a brief description.

[open-ended]

23) You indicated that the *forecast* information you need for informing decisions needs improvement or is unavailable. What are some of the barriers to using the following types of forecast information?

	Not available in a format that I can use	Don't know where to get the information	Accuracy is not sufficient	Resolution is not sufficient	Not enough information available	Don't understand how information can be used	I don't use this type of information
Surface hydrology information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Groundwater hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage basin management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meteorology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snow/ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24) If the *forecast* information you needed were made available, would you experience any of the following benefits from using the additional or new forecast information?

	No, this is not something that I would experience	Yes, this is something that I would experience
Reduced flood damage (property damage, injury or loss of life, lost business, recovery costs)	<input type="checkbox"/>	<input type="checkbox"/>
Reduced drought damage	<input type="checkbox"/>	<input type="checkbox"/>
Improved wastewater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved stormwater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved drinking water supply or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved water quality	<input type="checkbox"/>	<input type="checkbox"/>
Improved navigability (shipping, recreation)	<input type="checkbox"/>	<input type="checkbox"/>
Increased efficiency of hydroelectric power generation	<input type="checkbox"/>	<input type="checkbox"/>
Improved timing of water withdrawals and releases or its management	<input type="checkbox"/>	<input type="checkbox"/>
Improved agricultural practices	<input type="checkbox"/>	<input type="checkbox"/>
Improved endangered/threaten species or fisheries management	<input type="checkbox"/>	<input type="checkbox"/>
Other type of benefit? [Describe on next screen]	<input type="checkbox"/>	<input type="checkbox"/>

If respondent selects “other”, then ask Question #25.

25. If you selected “yes” for “other type of benefit,” please provide a brief description.

[open-ended]

26) You indicated that the *uncertainty* information you need for informing decisions needs improvement or is unavailable. What are some of the barriers to using the following types of uncertainty information?

	Not available in a format that I can use	Don't know where to get the information	Accuracy is not sufficient	Resolution is not sufficient	Not enough information available	Don't understand how information can be used	I don't use this type of information
Surface hydrology information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Groundwater hydrology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage basin management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meteorology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snow/ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27) If the *uncertainty* information you needed were made available, would you experience any of the following benefits from using the additional or new uncertainty information?

	No, this is not something that I would experience	Yes, this is something that I would experience
Reduced flood damage (property damage, injury or loss of life, lost business, recovery costs)	<input type="checkbox"/>	<input type="checkbox"/>
Reduced drought damage	<input type="checkbox"/>	<input type="checkbox"/>
Improved wastewater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved stormwater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved drinking water supply or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved water quality	<input type="checkbox"/>	<input type="checkbox"/>
Improved navigability (shipping, recreation)	<input type="checkbox"/>	<input type="checkbox"/>
Increased efficiency of hydroelectric power generation	<input type="checkbox"/>	<input type="checkbox"/>
Improved timing of water withdrawals and releases or its management	<input type="checkbox"/>	<input type="checkbox"/>
Improved agricultural practices	<input type="checkbox"/>	<input type="checkbox"/>
Improved endangered/threaten species or fisheries management	<input type="checkbox"/>	<input type="checkbox"/>
Other type of benefit? [Describe on next screen]	<input type="checkbox"/>	<input type="checkbox"/>

If respondent selects “other,” then ask Question #28.

28. If you selected “yes” for “other type of benefit,” please provide a brief description.

[open-ended]

29) You indicated that the *analyses* information you need for informing decisions needs improvement or is unavailable. What are some of the barriers to using the following types of analyses information?

	Not available in a format that I can use	Don't know where to get the information	Accuracy is not sufficient	Resolution is not sufficient	Not enough information available	Don't understand how information can be used	I don't use this type of information
Public alerts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meteorological analyses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydrologic analyses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climatological analyses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flood inundation mapping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information integration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30) If the *analyses* information you needed were made available, would you experience any of the following benefits from using the additional or new analyses?

	No, this is not something that I would experience	Yes, this is something that I would experience
Reduced flood damage (property damage, injury or loss of life, lost business, recovery costs)	<input type="checkbox"/>	<input type="checkbox"/>
Reduced drought damage	<input type="checkbox"/>	<input type="checkbox"/>
Improved wastewater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved stormwater management or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved drinking water supply or treatment	<input type="checkbox"/>	<input type="checkbox"/>
Improved water quality	<input type="checkbox"/>	<input type="checkbox"/>
Improved navigability (shipping, recreation)	<input type="checkbox"/>	<input type="checkbox"/>
Increased efficiency of hydroelectric power generation	<input type="checkbox"/>	<input type="checkbox"/>
Improved timing of water withdrawals and releases or its management	<input type="checkbox"/>	<input type="checkbox"/>
Improved agricultural practices	<input type="checkbox"/>	<input type="checkbox"/>
Improved endangered species or fisheries management	<input type="checkbox"/>	<input type="checkbox"/>
Other type of benefit? [Describe on next screen]	<input type="checkbox"/>	<input type="checkbox"/>

If respondent selects “other”, then ask Question #31.

31. If you selected “yes” for “other type of benefit,” please provide a brief description.

[open-ended]

32) Are there any other types of information beyond observations, forecasts, uncertainty, and analyses that you believe need improvement and are critical for informing decisions?

Yes, there are.

No, there are not. [Go to END.]

33) Please describe the other types of information that you believe need improvement and are critical for informing decisions: _____

Your survey has been submitted! Thank you for your feedback!