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Communications Update

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Playing for Keeps: Using Games to Address Flooding and Drought in the Cedar River Basin

ALEXANDRIA, VIRGINIA. Last month, the U.S. Army Corps of Engineers Rock Island District, Institute for Water Resources, and local partners held a "Multi-Hazard Tournament" (MHT) in Cedar Rapids, Iowa. A MHT is a simulation exercise designed to aid decision-making by playing out potential strategies to reduce drought, flood risk, and other water-related risks. The tournament challenged Iowa-Cedar river basin stakeholders to jointly address issues of major flooding, severe droughts, and water quality.

Referees deliberating teams' scores based on the appropriateness of adaptation options; consideration of the ecological, economic and societal impacts; and on innovation. Photo credit: Shawna Richter-Ryerson, NDMC

Broken into seven teams, the hum and competitive energy could be felt as teams discussed their options to reduce the impacts of forecasted climate conditions on the basin. Sixty participants ranged from federal, state, and local governments to academia, non-governmental organizations, and the agricultural sector. Investment options included restoring or adding wetland spaces, reclaiming property, raising houses out of flood zones, infrastructure improvements, and reinforcing levees.

Participants quickly grew frustrated as they found their allotted funds for annual investments, based on realistic funding options in the Cedar River basin, significantly limited their ability to invest in basin infrastructure on an annual basis. Facing this limitation, teams began to innovate on how to capitalize on investments made in the previous turns and the importance of thinking strategically about long-term investments.

To play, teams used a computer-based tool, the Iowa Watershed Decision Support System, to evaluate investment options and the impact they would have on public and private property damages, clean water act compliance, and habitat quality among other areas. Prior to each round, teams were given a budget for investments, a climate condition forecast and a list of pre-defined adaption options, which included localized alternatives and watershed alternatives.

According to the participant game handbook, "A strategy that invests too heavily on localized actions and does not look upstream

> *A system-wide management strategy may have the best outcome on the watershed resources.*

may be subject to unfavorable flow or water quality conditions." Teams could invest in policy, structural or non-structural adaptation options, and they had to decide what type of management strategy to take. "A strategy that invests too heavily in the watershed improvement actions may reduce flowrates and improve water quality but may not be enough to offset significant hydrologic hazards, resulting in major economic, social and environmental impacts."

Teams had to justify their choices to other teams, as well as to judges, through press releases delivered at the end of each turn. In turn four, participants adjusted their watershed management selections based on lessons learned in the three previous turns, but made selections under the scenario that climate change had caused more frequent and extreme hydrological hazards. Referees judged the teams based on the appropriateness of adaptation options, consideration of the ecological, economic and societal impacts, and on innovation.

"At the end of the day, the tournament allowed stakeholders to consider holistic and systematic approaches to dealing with water-related hazards in the basin by allowing them to share their knowledge and their perspectives of issues within the Cedar River Basin — an opportunity many may never have had before," said Andrea Carson, one of the organizers for the event from the Collaboration and Public Participation Center of Expertise with the U.S. Army Corps of Engineers. "I truly believe we guided the stakeholders in the Cedar River Basin to begin thinking along the lines of Integrated Water Resources Management, a goal that many, including the Corps, continually aim for and one-day help to achieve."

Using the Iowa Watershed Decision Support System to understand where investments could occur on the Middle Cedar. Photo credit: Shawna Richter-Ryerson, NDMC.

In the end, 71% of the participants who responded to a post-tournament survey said that they would likely use the tournament results to inform future decisions. "The beauty of the MHT is that the resources developed for the tournament are able to be utilized far beyond the day of the tournament," Carson said. "The MHT was one more piece of the puzzle that provided basin stakeholders with the information necessary to build on previous work in the Upper and Middle Cedar River basins."

Participants have also been given permanent access to the decision support tool (iowawatersheds.org/dss/tournament) so they can go back and examine each team's choices, plans and outcomes to continue informing decisions going forward.

Learn More
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Link to IWR's Conflict Resolution & Public Participation Center of Expertise (CPCX)

Funding for the Iowa MHT was provided by the USACE Flood Risk Management Program, Collaboration and Public Participation Center of Expertise, Asset Management Program, and ICIWaRM. Partners involved: U.S. Army Corps of Engineers Rock Island District, Portland District, Institute for Water Resources; Sandia

National Laboratories; University of Iowa IIHR; the City of Cedar Rapids; the National Drought Mitigation Center at University of Nebraska-Lincoln; the Natural Resources Conservation Service; U.S. Geological Survey; the National Integrated Drought Information System; and Iowa State University.

One "team" in the Iowa-Cedar Multi-Hazard Tournament wrestles with adaptation options as the clock winds down and a "referee" observes in the background. Photo credit: Andrea Carson, USACE.

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