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#SustainingCOWatersheds2020
Welcome to Day One!

SUSTAINING COLORADO WATERSHEDS 2020 CONFERENCE

A VIRTUAL EXPERIENCE

Business as (Un)Usual

Oct. 6-8, 2020
THANK YOU to our 2020 conference sponsors!

Sustaining (Benefactor) Level
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Headwaters (Presenting) Level
COLORADO Department of Public Health & Environment

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Thank You Stream Sponsors!
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American Rivers

Colorado River District

Saint Vrain and Left Hand Water Conservancy District

San Luis Valley Water Conservancy District

Vranesh and Raisch
Announcements

Connect with conference presenters...contact information for all speakers is available if you click on them in Expo.

We will be sharing the attendee list for the conference to help advance networking.

Attend today’s Interactive Video Social at 3:45-4:30pm
• Learn along with friends and colleagues and make new connections
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#sustainingCOwatersheds2020
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- Polling through Menti is anonymous. Please be respectful & professional.
- Please reserve GoToWebinar's 'Question' box for technical issues & 'Chat' box for resources.
- We have a fixed time for questions. Please contact individual presenters for unanswered questions. Speaker info can be found in Expo.
In which major river basin do you reside?

1st: South Platte
2nd: Colorado
3rd: Arkansas
4th: San Juan/Animas/Dolores
5th: Gunnison
6th: Rio Grande
7th: Yampa/White
8th: Out of State
9th: North Platte
In one word please describe what Business as (Un)Usual means to you in 2020.
RIVER MUSIC
Hydrographs Play A Symphony
By Dave Merritt
The River Ethic

Shaping a river ethic to improve societal understanding of stream corridors

THE RIVER ETHIC
Shaping a river ethic to improve societal understanding of stream corridors

Panelists:
Dr. Ellen Wohl, CSU
Dr. LeRoy Poff, CSU
Dr. David Merritt, USFS
Kevin Houck, PE, CWCB

Moderator: Julie Ash,
CRA/Stillwater Sciences
(and channeling
Matt Kondratieff, CPW)
Get ready for solid science delivered inspirationally!

- The first River Ethic dialogue* was in February as part of CRA’s Colorado Stream Restoration Network (CSRN) series of workshops
- Continued aim to bring the power of science to educate and raise awareness to support change
- Provide guidance that allows people to act effectively
- Still just in dialogue mode...

*hosted recently by CRA; we know we aren’t the first with this idea
The River Ethic

- Modeled after/sources:
  - Wilderness Act of 1964
  - Leave No Trace
  - A Sand County Almanac; The Land Ethic (Aldo Leopold’s writings)
  - NPS Wilderness Ethic

Icon associated with Wilderness

Matt Kondratieff, CPW

Gore Canyon, Colorado River
The River Ethic

- Parallels to Wilderness Ethic
  - Special places
  - Dangers exist
  - We know to go prepared
- Personal observations
- Professional observations
- Avoid “us vs them” messaging – all are needed
- Wilderness – not adversarial - “it just is this way”

Two project settings I’ve worked on recently – room for the river – and less so
The River Ethic

The River Ethic can bring scientific understanding to inform three primary groups:

- The general public
  
  *tread more lightly and safely*

- Recreationalists
  
  *same +Sentinel Rivers protection*

- Professionals working to manage or improve our resources
  
  *decision-makers can capitalize on opportunities*

  *practitioners can apply most appropriate approaches within constraints*
The River Ethic

- Today’s panelists bring their eloquence, passion, and deep wealth of knowledge
- Share latest scientific knowledge and ideas for bringing science to the public and decision-makers in ways that help them act

“A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”

-Aldo Leopold
The River Ethic

- More research will always further understanding, however...
- We submit that “the science is already there”
- We don’t need to wait on more research to take action
- We need to bridge gaps in communication with larger groups
Toward a River Ethic: The Importance of Being Messy

Ellen Wohl
Geosciences
CSU
Key points

Natural rivers are spatially heterogeneous

Varying inputs & the ability to adjust create & maintain spatial heterogeneity

A river ethic starts with geomorphic integrity
natural flow ($Q$), sediment ($Q_s$) & large wood (LW) regimes

valley geometry & human influence (position in river network, spatial limits, boundary erosional resistance, base level stability)

fluxes

context

results in

spatial heterogeneity, connectivity, resilience, geomorphic & ecological integrity

gradient  planform  flood inundation  high water table  biodiversity  carbon stock

RIVER CORRIDOR
Spatial heterogeneity fosters river ‘health’: 3D connectivity, retention, nutrient uptake, habitat, biota, resilience ... ecosystem services

Ability to adjust spatial & temporal variations in inputs have been significantly altered – spatial heterogeneity & associated ecosystem services have significantly declined
End the knee-jerk response to large wood & bank erosion

Bank Erosion as a Desirable Attribute of Rivers

Joan L. Florsheim, Jeffrey F. Mount, and Anne Chin

BioScience, 2008


Ellen Wohl, Brian P. Bledsoe, Kurt D. Fausch, Natalie Kramer, Kevin R. Bestgen, and Michael N. Gooseff

J Am Water Resources Association, 2016

Wood Jam Dynamics Database and Assessment Model (WooDDAM): A framework to measure and understand wood jam characteristics and dynamics

Daniel N. Scott, Ellen Wohl, Steven E. Yochum

River Research & Applications, 2019

Managing for Large Wood and Beaver Dams in Stream Corridors

Ellen Wohl, Daniel N. Scott and Steven E. Yochum

USDA Forest Service General Technical Report RMRS-GTR-404
The Beaver Restoration Guidebook

Working with Beaver to Restore Streams, Wetlands, and Floodplains

Version 1.0, June 30, 2015

Prepared by
US Fish and Wildlife Service
National Oceanic and Atmospheric Administration
Portland State University
US Forest Service
Put the river back in its place ...
   oh, wait – we’re in its place

Clean up the river ...
   if you’re referring to sediment & large wood, it’s not dirty
River restoration: First, do no harm
Would you be willing to record and send CRA a 10 second video clip on what a River Ethic means to you?
A River Ethic for the Anthropocene

N LeRoy Poff
Colorado State University
Rivers as dynamic, heterogeneous, connected, biodiverse hydro-ecosystems

Temporal Variability

Spatial Heterogeneity

Landscape Connectivity
Most rivers are modified ... and more is on the way!
Brisbane Declaration (2007)

“the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems”

(http://www.watercentre.org/news/declaration)
Poudre River Hydrograph: Functional Flows that Sustain Ecosystem Functions

- **Floodplain inundation**
  - maintain channel width and heterogeneity
  - riparian tree and wetland habitat
  - shallow groundwater

- **Cobble movement**
  - bed rejuvenation
  - fish/insect habitat

- **Gravel movement**
  - spawning habitat
  - insect habitat

- **Silt flushing**
  - Insect habitat

- **Rate of Recession**
  - cottonwood seedling survival
  - groundwater discharge rate

- **Reduced Average Peaks**
- **Baseflow**
  - brown trout spawning and overwinter survival

- **Dry Streambeds**
- **Fish/insect wetted habitat; Brown trout egg and fry survival**

Month: Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Spreading a River Ethic from the Bottom-Up?

- Identify your values
- Share your values with others
- Understand what sustains these values
  - Hydrogeomorphic, Water Quality
  - Social, Economic, Cultural
- Promote action that sustains rivers as dynamic, heterogeneous, connected, biodiverse hydro-ecosystems

Paff et al., 2016, Nature Climate Change
How can we better communicate the importance and beneficial aspects of large wood and bank erosion to stakeholders and regulators?
How can we enhance or restore resilience to channels & floodplains in a time of conflicting demands (warming climate and increasing human population?)

- Beavers
- Easements
- Beavers
- Channel Migration Easements
- Vegetation
- Beavers
- Parks and open space
- take Ellen's class
How can we enhance or restore resilience to channels & floodplains in a time of conflicting demands (warming climate and increasing human population)?

- Beaver
- Incentives
- stakeholder engagement
- improve efficiency
- Beavers are important
- Communication
- Collaboration
- Set some aside
- Vegetation
How can we enhance or restore resilience to channels & floodplains in a time of conflicting demands (warming climate and increasing human population?)

- More space
- Beavers
- Open space
- Local regulation
- Provide access that encourages human engagement and understanding.
- Buffers
- Incentives
- Land use decisions
- Set ourselves up for success! Long-term thinking. Uncomfortable now to avoid stress later
How can we enhance or restore resilience to channels & floodplains in a time of conflicting demands (warming climate and increasing human population)?

- Multi-functional projects
- Administrative controls/room for river
- Demonstrate that healthy rivers cost less and provide more benefits.

- better water management and new water laws
- naturalization of channels in urban settings
- Allow biological services (beavers) to manage river landscapes

- I am in Ellen's class this semester. Give the streams room to move.
- recognition of equal value
- Beavers!
River ethic: Is there a limit?

David M. Merritt
USDA Forest Service
National Stream and Aquatic Ecology Center
Santa Margarita River

Coast range
New Stream-reach Development (NSD) Potential by Subbasin for the United States
Protective measures for rivers

- Wilderness or National Park
- Wild and Scenic River – outstandingly remarkable values
- State Instream Flow programs and protections
- Federal Reserve Water Rights
- Endangered Species Act
- UNESCO World Biosphere Reserves
- Legislation
- Constitutional amendment
- ‘Sentinel Rivers Network’ to preserve natural river heritage
Do you believe it's critical to preserve sentinel river systems?

- Yes: 42
- No: 1
To A River Ethic – Let Floodplains Be
Floodplains in Cities

By Kevin Houck, P.E., CFM, Colorado Water Conservation Board
What do you view as the most important function/value that streams provide?

- Habitat: 31
- A place to convey floodwaters: 13
- Move water and sediment down the valley (aka streams for streams-own sake): 8
- A source for water resource consumptive uses (household, municipal, industrial, agricultural): 4
- Recreational opportunities, place for relaxation or inspiration: 4
Hoffman Drainageway - Thornton
Estes Park
“Improvements” may lead to urban streambank erosion
When altering streams for project purposes, what is the most important factor to consider?

- Creating Developable Lands: 2
- Protecting Public Safety: 9
- Protecting Infrastructure: 4
- Maximizing Recreational and Environmental Benefits: 15
- Preserving Stream Stability (Geomorphology): 33
Cherry Creek Trail - Denver
Bluff Lake Nature Center
Greenway Park, Denver
Confluence Park, Denver
Grange Hall Creek Floodplain - Thornton
Floodplains Are For Floods (and hopefully a few other things)

- Encroachments might create problems with future flooding or geomorphological changes
- Look for multiple benefits to be provided by floodplains
- Parks, open spaces, golf courses, and other recreational facilities
- Water quality filters
- Floodplain regulations make it harder to develop floodplains for a reason
- Make floodplains a community amenity
The River Ethic

Shaping a river ethic to improve societal understanding of stream corridors

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“I have purposely presented the land ethic as a product of social evolution because nothing so important as an ethic is ever 'written'... It evolves in the minds of a thinking community”

Aldo Leopold, The Land Ethic, A Sand County Almanac.
Which potential “products” of a River Ethic do you think would be most useful?

- River science primer in laymen's terms for use by parents, K-12 teachers, recreationalists, etc. (33)
- Awareness activity ideas to inspire groups (e.g., geocaches, local river passport) (9)
- “Living document” available for reference by professionals (4)
- Awareness swag (e.g., water bottles with Colorado river segment list (like 14er list)) (6)
- Sentinel River candidates list (6)
- Guidance bullets available for use/adoptions on other groups’ websites (3)
- Lecture notes/powerpoint available to inspire college professors for watershed sciences classes/programs (2)
“In the end, we will conserve only what we love; we will love only what we understand; and we will understand only what we are taught.”

Baba Dioum, Senegalese Environmentalist

More inspiration for the road:

“Never underestimate the power of a small group of committed people to change the world. In fact, it is the only thing that ever has.” —Margaret Mead

“Consciousness-raising is always the first step toward change.” —Author M. Gigi Durham, PhD

The River Ethic
Q&A: Enter your questions for our presenters!

- lunch
- How important are semantics in river science?
- Are you familiar with ‘dendritic design’?
- Thanks everyone!
- What is a primordial river?
- Should we push for federal or state constitutional protections of rivers or nature?
- you are all awesome
- DR. Wohl: your comments about “not rushing to stabilize” - is that true in urban streams, that are now perennial streams due to urbanization?
- Can easements provide opportunities for passive restoration?
Q&A: Enter your questions for our presenters!

Thanks to the panel members. Excellent perspectives.

What should the top priorities be for developing a river ethic that is likely to be widely embraced in the US (and elsewhere)?

What about the water quality impacts of lawn areas in flood plains? I'm thinking of fertilizer, herbicide, and pet waste. Any thoughts on this?

Thanks. I'm on Buzzard's Bay in Massachusetts. My view is water, your talks are on water. Powerful.

Lunch is on Kevin

Dog Parks seem like the one below Chatfield dam, are popular and seem like a great use of open space, but when there's a creek or a river running through it, the runoff has got to be abhorrent. Has anyone studied this?

What are the implications of the new WOTUS regime to the mitigation market effort?

Thanks Peter, so what have mitigation markets gotten right?

Can you give examples of the process domains that you said Oregon is using?
Q&A: Enter your questions for our presenters!

- What are the best opportunities to move the needle in the limitations you're speaking to?
- What have mitigation markets gotten right?
- What ecological, political, and legal differences between eastern and western states do you attribute to differences in stream banking?
- What are the corporate funder investors getting for return on investment?
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Attend the fitness session tomorrow morning at 9-10am
• Dance class led by Mallory Hiss of the Colorado Watershed Assembly
• Tune up your body to set the tone for a day of virtual conferencing!

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THANK YOU!

Our next session begins right after the lunch/networking break at 1:00pm! Mitigating Impacts on Streams-Technical and Policy Perspectives

To get there....

Close out of this Webinar session, return to EXPO, and navigate to Session 1 on Oct. 6

Then open that session and click “Join” to enter the next Webinar session