EXPLORING OPPORTUNITIES FOR INTEGRATED MAPPING AND FUNCTIONAL ASSESSMENT OF RIVERINE AND COASTAL FLOODPLAINS AND WETLANDS

A NATURAL FLOODPLAIN FUNCTIONS ALLIANCE AND WETLAND MAPPING CONSORTIUM WORKSHOP

HELD ON APRIL 10, 2018

Association of State Floodplain Managers Annual Conference
Phoenix, AZ
June 19, 2018

SIGNIFICANT EVENTS IN 2017

- August 15: EO on Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure
  - Repeals FFRMS
- August 25: Hurricane Harvey
- September 10: Hurricane Irma
- September 20: Hurricane Maria
- Wildfires in CA, ID, MT, OR and WA

TMAC & NFIP

- FEMA's Risk Mapping, Assessment and Planning (MAP) Program
  - Generally only includes data on elevation, hydrology, infrastructure, hydraulics and land use for the purpose of informing NFIP rates
  - Many small streams in rural areas are not mapped at all
  - In VT 80% of streams and rivers not mapped for potential flood risk

- TMAC (Technical Mapping Advisory Council)
  - Moving away from 100 yr flood (1% risk) maps to structure-specific risk
  - Infers best and highest use of floodplain is development vs natural floodplain function

- NFIP (National Flood Insurance Program)
  - Up for reauthorization
  - Reached its $30.4 billion borrowing limit

CHALLENGES & OPPORTUNITIES

- The regulatory environment is different for wetlands (dredge and fill) and floodplains (hazard mitigation, flood attenuation, property damage) both are regulated and functions are part

- Mapping and functional assessment techniques are being developed independently for features that occupy the same or similar geographic space and often interact.

- Assessment tools and functional correlations are being developed for both mapping needs yet they are not necessarily informing each other.

- Map products are generalizations of reality based on collected data and presentation. The underlying data and models are often more robust than the final generalized map product.

- Communication between agencies, regions, users, stakeholders and developers is often minimal or absent.

- With fiscal realties, partnerships are essential

WETLAND MAPPING AND NWI+

Since the early mid 1990s, the wetland mapping community has been enhancing wetland data by adding LLWW descriptors to enhance the information in the existing wetland classification standard utilized by the National Wetlands Inventory by providing information on potential wetland function.

LLWW descriptors describe:
- landscape position (relation of a wetland to an adjacent waterbody)
- landform (the physical shape of the wetland)
- water flow path (the direction water flows into and out of the wetland)
- waterbody type (lake, river, stream, or pond).

Figure 1. Application of LLWW descriptors to a region with nontidal wetlands. Landscape positions: LR – lotic river, LS – lotic stream, LE – lentic, and TE – terrene; Landforms: BA – basin, FR – fringe, FP – floodplain, SL – Slope; Water flow paths: OU – outflow, IS – isolated, TH – throughflow, BI – bidirectional-nontidal; other descriptors: pd – pond (association), hw – headwater; Waterbodies: PD – pond, LK – lake. Note: Landscape position can be added to lakes and ponds if desirable.

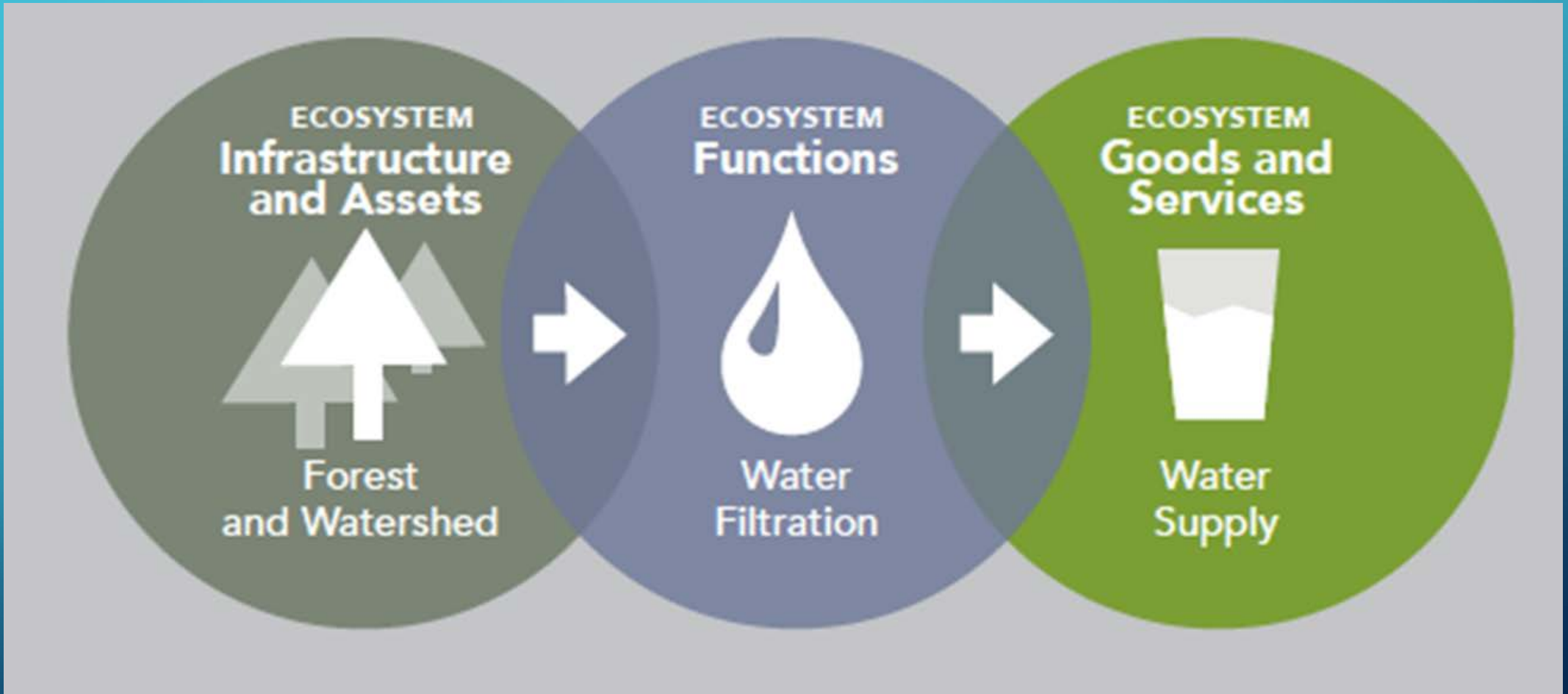# Using Maps to Communicate the Benefits of Ecosystem Functions
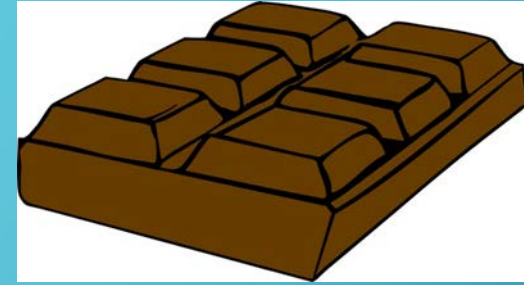

Image credit: Earth Economics

HEY, WAIT A MINUTE…

Two ad hoc committees facilitated by ASWM:

- Natural Floodplain Functions Alliance (NFFA)
- Wetland Mapping Consortium (WMC)

Let's Host a Workshop!

- Integrate wetland and riparian geospatial mapping techniques and data into floodplain mapping programs

- National classification standard?

- Attain multiple co-benefits, e.g., reduced flood risk, clean drinking water, wildlife habitat, recreational open space, etc.

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Hey, Wait a Minute…

- Too ambitious for one workshop…

- Expanded to multi-year project

  - Year 1: Case For Support

    - Tuesday, April 10, 2018

    - Tommy Douglas Conference Center, Silver Spring, MD

  - Year 2: Technical Barriers, Possibilities, Needs

  - Year 3: Program & Policy Changes Needed

CHARGES FOR THE DAY

1) What if functional assessment efforts were integrated?
2) How can this be achieved?
3) What are the advantages and disadvantages?
4) How do we address initial data inventory?
5) How do we incorporate mapping innovation?
6) How do we fund map/data maintenance?
7) How can we share methods and data layers?
8) How do we promote safe, healthy communities?

CASE STUDIES

Management Implications of Vermont Wetland and
Floodplain Functional Assessment and Mapping:
Mike Kline, Vermont DEC Rivers Program

Functional Assessments in Current Wetland and
Floodplain Mapping: Sinan Abood, U.S. Forest
Service

Contributing to Riparian Area Management Using
Wetland Functional Assessment Data: Andy
Robertson, Saint Mary's University of Minnesota

Floodplain Mapping for Salmon Habitat Restoration and
Monitoring: Examples from the Pacific Northwest:
Tim Beechie, NOAA Northwest Fisheries Science
Center

From Functions to Ecosystem Services: The Economic Value
of Floodplains and Wetlands: Elliott Campbell,
Maryland DNR

CASE STUDY DISCUSSION: EMERGING THEMES

- Various agencies, groups and academics have been working on pieces of the puzzle for some time

- Similar collateral spatial data sets are being used for analysis: LiDAR, NHD, C-CAP, Shoreline, Land Cover, Wetlands, DFIRM, Flood Heights, Stream Gauge

- Models and automated tools are available to generate and analyze new data RBT, USFS Riparian Toolkit

- Available data being used in new ways to assess and assign functions

- Communication is lacking but essential. Synergies and partnerships are waiting to be developed

FEDERAL PANEL

Panelists: Megan Lang, FWS NWI; Maria Honeycutt, NOAA; Stephen Aichele, USGS; Luis Rodriguez, FEMA; Jay Thompson, BLM

Federal Panel Summary

- Provided excellent overview of mapping efforts and available data
- Summarized agency priorities for coastal and riverine floodplain/wetland functional assessment
- Identified how agencies are using their own data to address agency mandates
- Outlined plans for future development including opportunities, challenges and threats
- Reinforced the need for partnership efforts at all levels

BREAK-OUT SESSION – 3 GROUPS:

1) Areas of Overlap and Distinction
2) Key Challenges and Information Gaps
3) Opportunities to Leverage Resources.

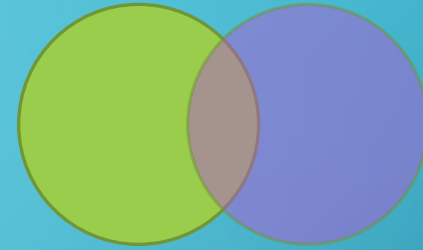**Within each group's assigned topic area, they had to develop 2-3 bullet points that described:**

1) What are the needs based on our discussions?
2) What are some actions that can be taken to address the needs?
3) What are the challenges?

AREAS OF OVERLAP AND DISTINCTION

NEEDS

1. Take action to restore and avoid/protect
2. Historical context, current status and future conditions; be realistic

CHALLENGES

1. No one size fits all
2. Don't have consistent framework for making decisions; regulations don't work together, and no decision framework

ACTIONS

1. Specific communication strategy focused on two or three key gaps at all levels
2. Unlikely allies; need to work with new partners: industry, DOT, Chamber of Commerce, etc.

KEY CHALLENGES AND INFORMATION GAPS

NEEDS

1) Consensus on mapping future conditions (CC impacts, stormwater, development, restoration opportunities)

2) Move beyond the 100 yr- line- show shades of risk (without sacrificing expansion of areas that are mapped)

CHALLENGES

1) Improved communications to decision makers and end users

2) Standardized methodologies for ecosystem service valuations

ACTIONS

1) Coordinated effort to tell better stories about the benefits of mapping investments

2) Encourage FEMA to allow states to include advanced mapping on flood hazard maps (i.e., VT including erosion hazard zones on their maps)

OPPORTUNITIES TO LEVERAGE RESOURCES

NEEDS

1) Hardware and/or hardware alternatives
2) Easy to use on-line data applications based on need or scope. Accessible and downloadable for GIS users.
3) Funding

ACTIONS

1) Leverage what already exists. Expand the utility of tools already being used. Know what you are trying to achieve.
2) Training and accessibility – YouTube! Make sure the data you have created is known. Communication – story maps and case studies – provide examples. Videos – video exchange on examples of how data is used.
3) Partnerships

CHALLENGE

1) Communication – make sure created data gets used. – looking for real needs for the data so it gets applied.
2) Continuity issues – data changes, people change. How do you make sure others aren't re-inventing the wheel.
3) Political environment – accessibility issues. Priorities. Limited resources. Inequity.
4) Challenges with partnerships. Feds – is that part of the mission? Trust.

FINAL THOUGHTS – COMMON THEMES:

- A need for improved communication among professionals, knowledge sharing, tools, models
- Partnerships, likely and unlikely, are critical to provide technical assistance, combine funding, expertise, etc.
- Digital data availability is important (identify who has it, where it is, and how to obtain it)
- Continuity of knowledge is key (stop reinventing tools and/or data that is already out there)
- Leverage existing mandates and legislative tools
- Clearly articulate use cases to demonstrate success and generate fiscal support
- Innovate and embrace technology while bridging the gap
- Tie mapping efforts to societal needs, hazards and costs
- Embrace social science to tell the story of social significance
- Make avoidance a priority
- Tools can be complex, but results should be easy to explain
- We need to provide clear, consistent, accessible, and consumable messaging about the benefits and enhanced decision-making tools provided by integrating maps and providing site specific information about natural floodplain functions and services

Next steps include:

1. Continuing to work with the Steering Committee and others, exploring opportunities and challenges over the next year, developing webinars, participating in conference calls and planning the next workshop.
2. Coordinating and attending in-person meetings with agencies such as FEMA, TMAC, ACOE, DOI, EPA, USGS, Planning Committee members and others to discuss the opportunities and technical challenges of mapping floodplain functions and using that data for decision-making.
3. Identifying existing tools that use condition and function (existing or potential) as an indicator for prioritization of floodplain, riparian and wetland protection and/or restoration and explore how these tools can be used to inform land use decisions.
4. Planning for a second workshop in 2019 that will dig deeper into the technical challenges and opportunities.
5. Planning for a third workshop in 2020 to identify program and policy changes that need to be made to implement an integrated approach.

THANK YOU TO:

ASFPM Foundation

- Doug Plasencia
- Brad Anderson
- Jerry Sparks

Workshop Steering Committee:

- Larry Larson and David Fowler, Association of State Floodplain Managers
- Andy Robertson, Saint Mary's University of Minnesota
- Eileen Shader, American Rivers
- Jared Saures, Earth Economics
- David Carlton, Dkcarlton & associates
- David Knipe, Indiana DNR
- Mike Kline, Vermont DEQ
- Maria Honeycutt, NOAA
- Megan Lang, US Fish and Wildlife Service
- George Xian, USGS

QUESTIONS?

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