



# COMMUNITY DIGITAL WATERSHEDS & SHARED ANALYSIS TOOLS

## Earth Systems Institute & Collaborating Agencies

NetMap

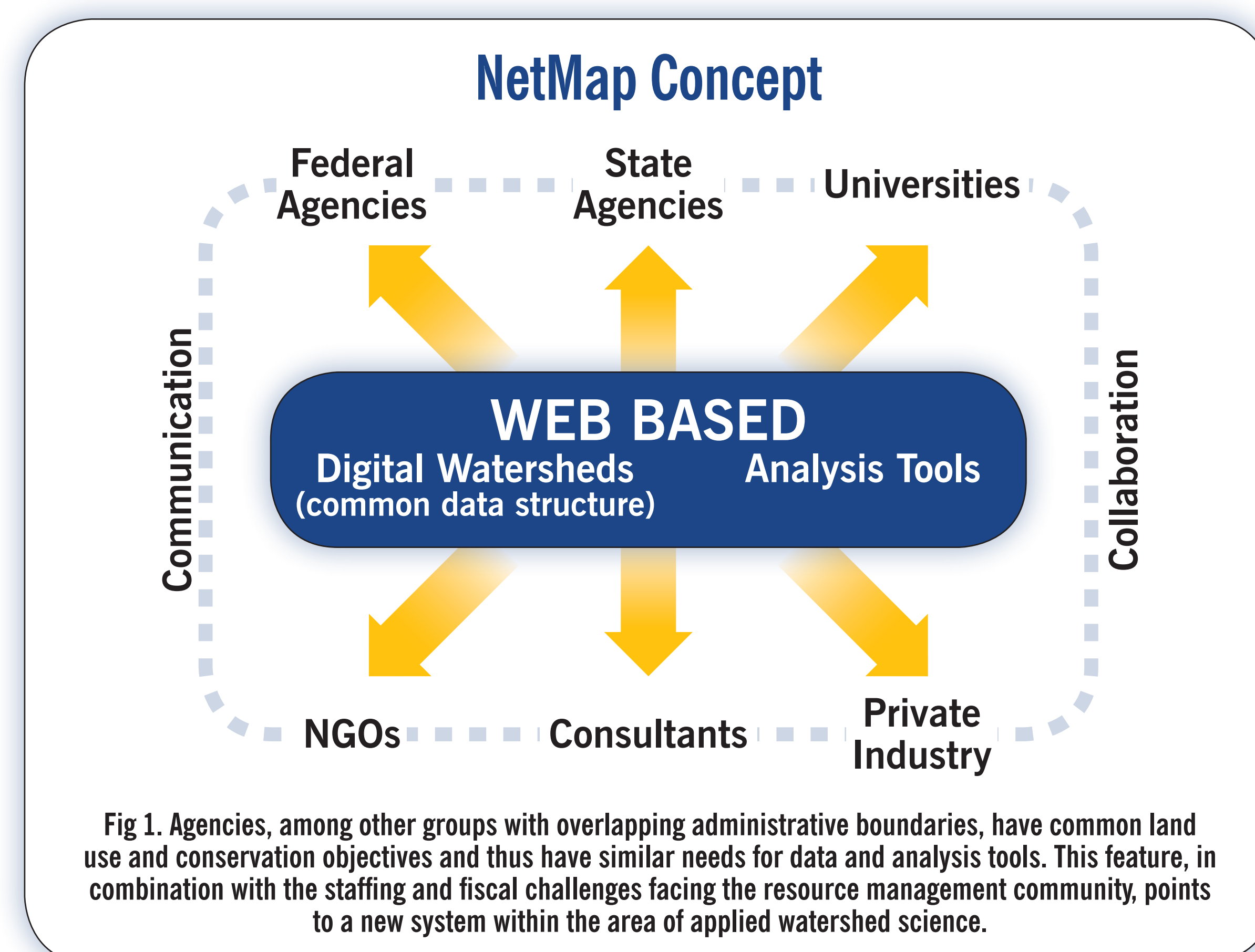
Community Digital Watersheds & Shared Analysis Tools ([www.netmaptools.org](http://www.netmaptools.org))

## The NetMap Project

Since 2006 Earth Systems Institute (non profit), in collaboration with the U.S Forest Service (Pacific Northwest and Southwest Research Stations, and Region 6), Bureau of Land Management, NOAA-Fisheries and the EPA, among other groups in the PNW, have been building a new system of community supported digital watersheds and shared analysis tools.

## NetMap's Components

- ▶ Geographically extensive and uniform coverage of digital watersheds within a common data structure;
- ▶ User friendly analysis tools (Arc GIS) that work with digital watersheds for decision support consistently across agencies;
- ▶ Community (stakeholder) supported design, development and maintenance of shared digital watersheds and tools.



## Shared Tool Development

Agencies and other groups can pool their ideas and resources to share the efforts and costs involved with developing and disseminating the most advanced (yet user friendly) set of analysis tools that integrate with digital watersheds. This is a powerful form of leveraging in an era of tight budgets and reduced staffing.

Once new tools are developed (usually quarterly) all users have immediate access to them. Examples include:

- ▶ Road drainage diversion tool (NOAA-Fisheries),
- ▶ Flexible floodplain mapping tool (EPA),
- ▶ GIS stream layer cross talk tool (Wild Salmon Center, NGO),
- ▶ Wood recruitment tools (Siuslaw National Forest).

See all tools at [netmaptools.org](http://netmaptools.org)

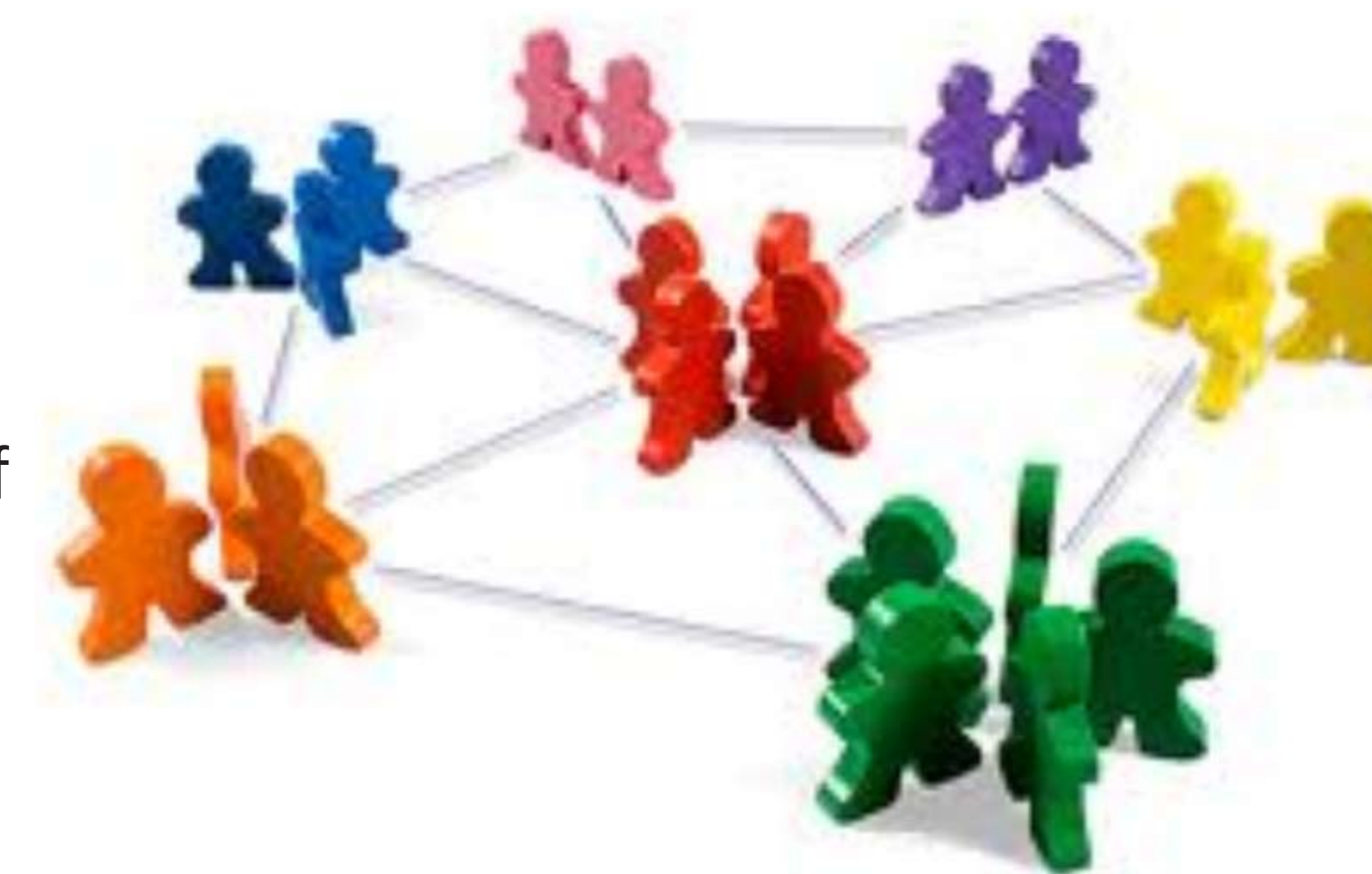


Fig. 2. Tools are built from the ground up according to users needs.

## Ground-Up Tool Design

Models or analysis tools implemented from the top down may miss specific needs of agency specialists and managers. NetMap's design reflects guidance from its users (including its science advisory panels) involving new analysis tools and the structure of digital watersheds.

Web-based technical help manuals can accommodate contributions from users, making NetMap a networking and learning experience, Wiki-style.



## Community Digital Watersheds

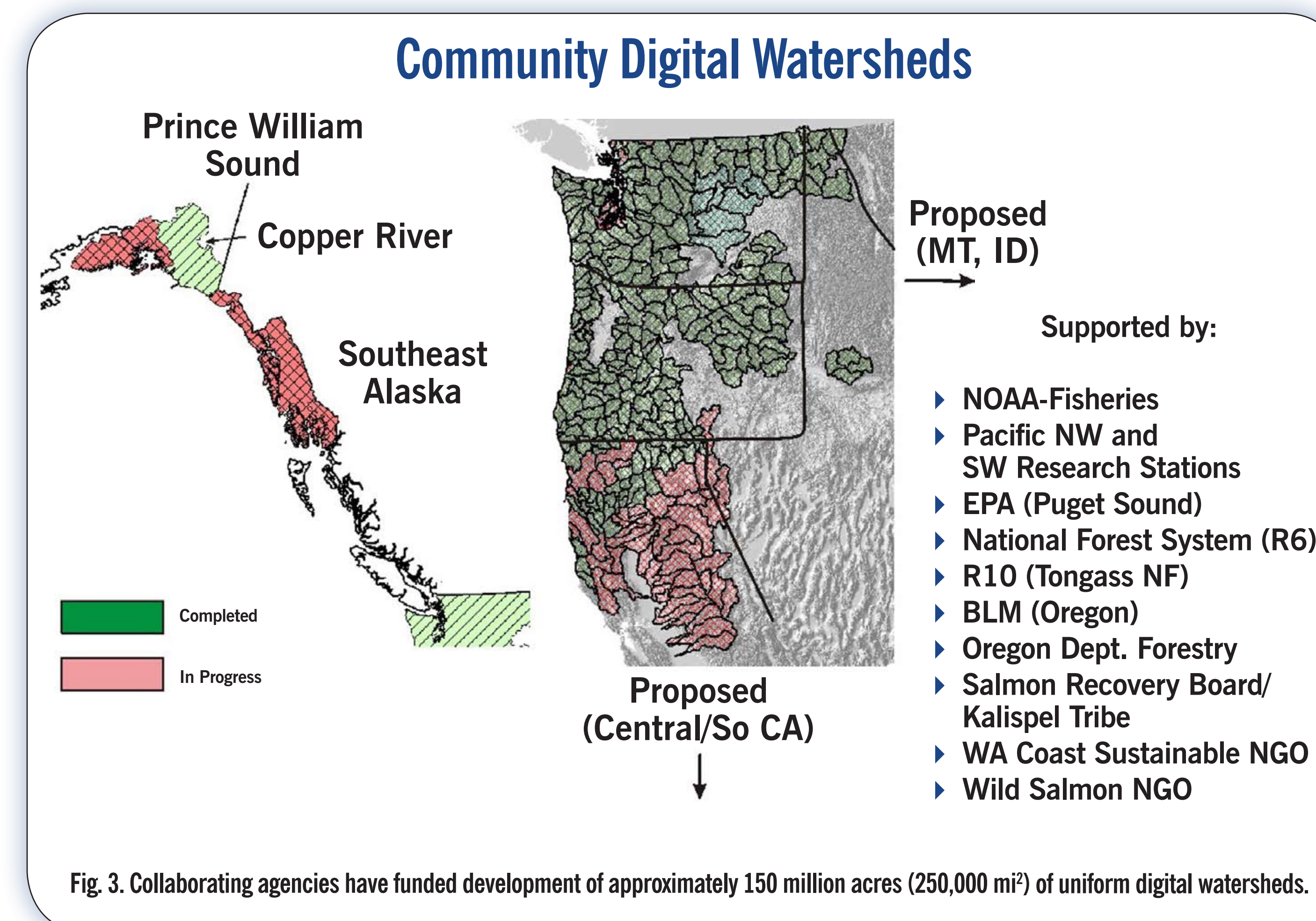
Community digital watersheds are comprised of synthetic routed and attributed stream layers in combination with drainage wings, segmented road layers, and the multiple parameters (~100) available in NetMap. Channel segment lengths can be fixed or variable ranging from tens to a couple hundred meters.

Advantages of uniform digital watersheds:

- ▶ Supports creation of shared tools
- ▶ Leads to analysis of dissimilar watersheds in similar ways
- ▶ Promotes increased consistency within and across agencies
- ▶ Encourages increased communication and collaboration



Drainage wings identify a stream segment's local contributing area

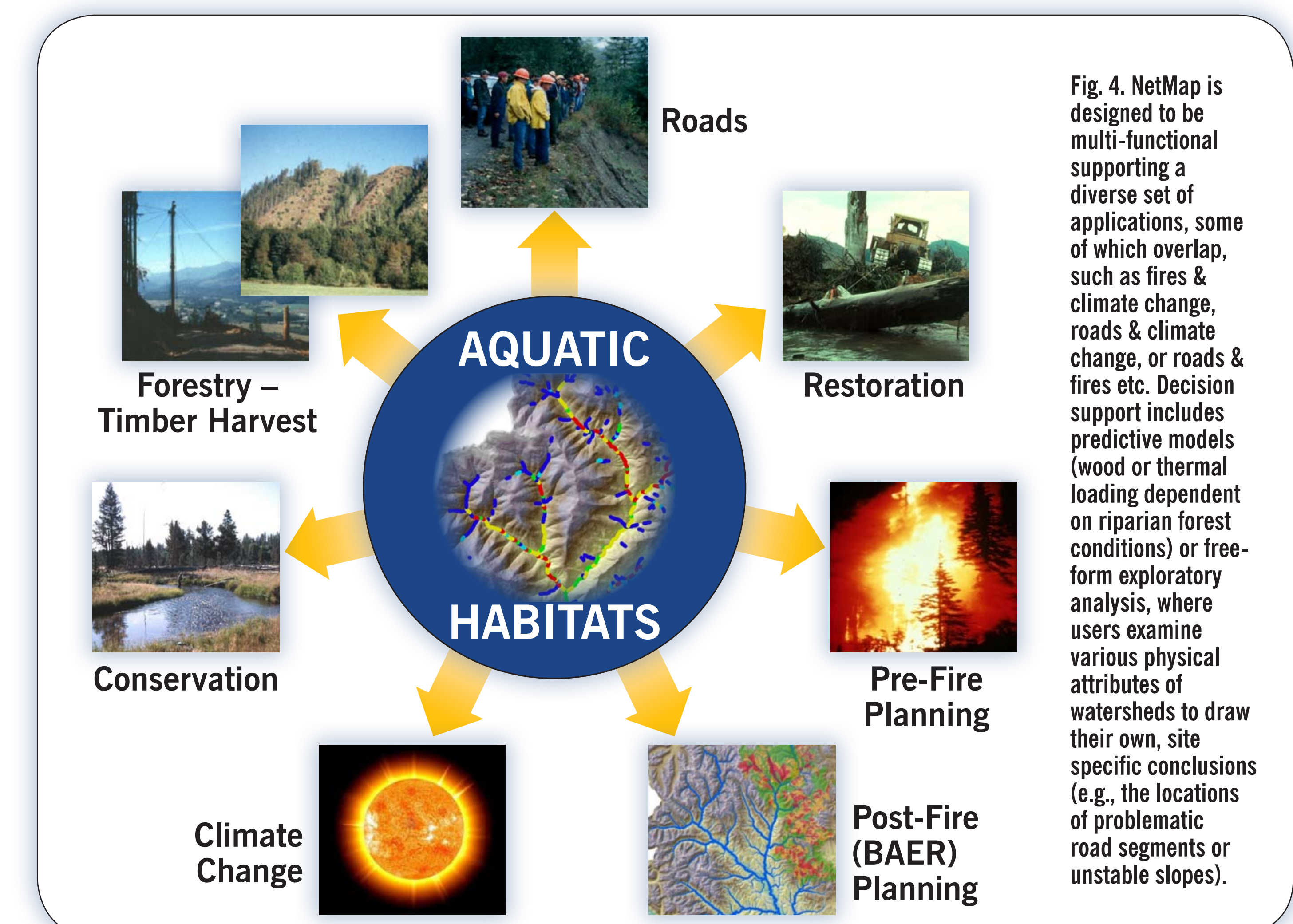


## What's in the Future?

- ▶ Modular NetMap Tools (Plug Ins)
- ▶ Node-based digital stream layer across the western U.S. where users select their area of interest, define segment length, segmentation and channel initiation criteria; networks can be adjusted based on local knowledge
- ▶ Watershed scale hydrology model
- ▶ Habitat connectivity tool
- ▶ Browser based tools

The NetMap project seeks additional collaborators to expand tools, digital watershed coverage and users.

## Multiple Applications



## System Compatibility

NetMap uses and/or communicates with existing GIS stream layers (incl. NHD) via a cross-talk tool (e.g., users can maintain their own stream networks as desired).

NetMap is designed to integrate with other types of models, stream layers and digital databases. NetMap can stand alone or provide information to other modeling efforts.

## System Sustainability

As a community system, NetMap requires constant maintenance in the form of repairs, updates, new tools (to reflect new science), new digital databases and user support to be sustainable. Maintenance and support are not covered through conventional grant funding.

Thus, NetMap's open source system is evolving into a subscription-based plan to ensure the continuing technical evolution and sustainability of its digital watersheds and analysis tools.



## The Economic Imperative

Staff levels across most federal agencies are declining. Budgets have been flat over the last decade and they may decline in the future; in some agencies an increasing proportion of funding is being allocated to fire control.

Yet, responsibilities of resource managers and agency specialists are increasing with new ones being added (climate change).

Staff are being asked to do more with less and thus creative solutions are needed. Community based systems are one of the solutions (see 2009 AGU brief on "Future of Applied Watershed Science at Regional Scales" (at poster).

Contact Earth Systems Institute at:  
[www.earthsystems.net](http://www.earthsystems.net) or [www.netmaptools.org](http://www.netmaptools.org)