

A prospective graduate program in river restoration at the University of Washington

A progress report

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What is the goal?—to articulate a plan to graduate Masters-level students at the University of Washington with professional-quality, interdisciplinary training in the principles and practice of river restoration.

Talk outline:

- What is “river restoration”?
- Why is such a program needed?
- What are the opportunities?
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Restoration and Rehabilitation:

RESTORATION: The (complete) structural and functional return to a predisturbance state.

Merely recreating the form without the functions, or the functions in an artificial configuration bearing little resemblance to a natural resource, does not constitute restoration.

REHABILITATION: The partial structural and functional return to a pre-disturbance state.

“River restoration means repairing waterways that can no longer perform essential ecological and social functions ...”

(Palmer and Allan, 2006, National Academy of Sciences Journal)

This is a multi-purpose definition, embraced here:



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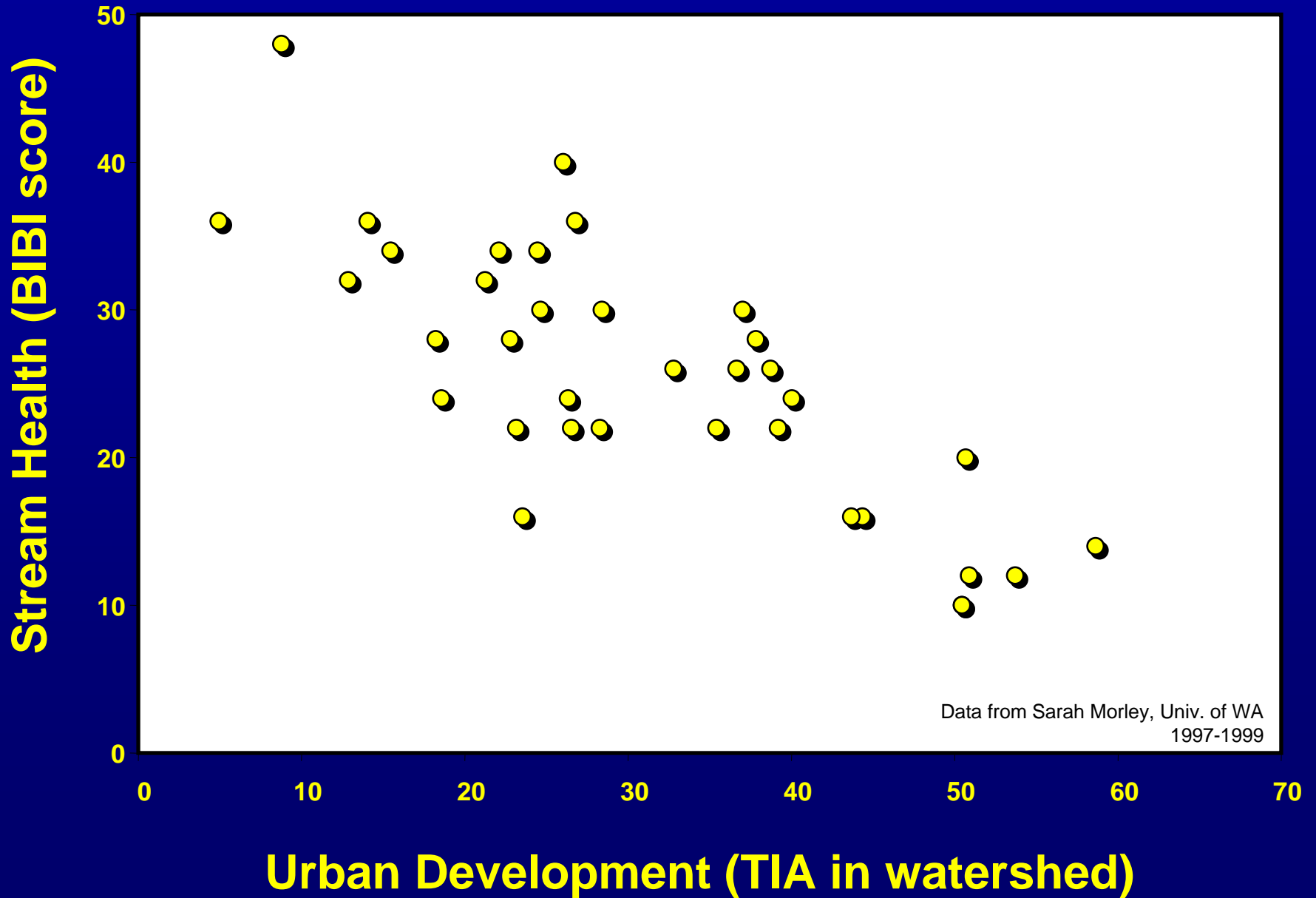
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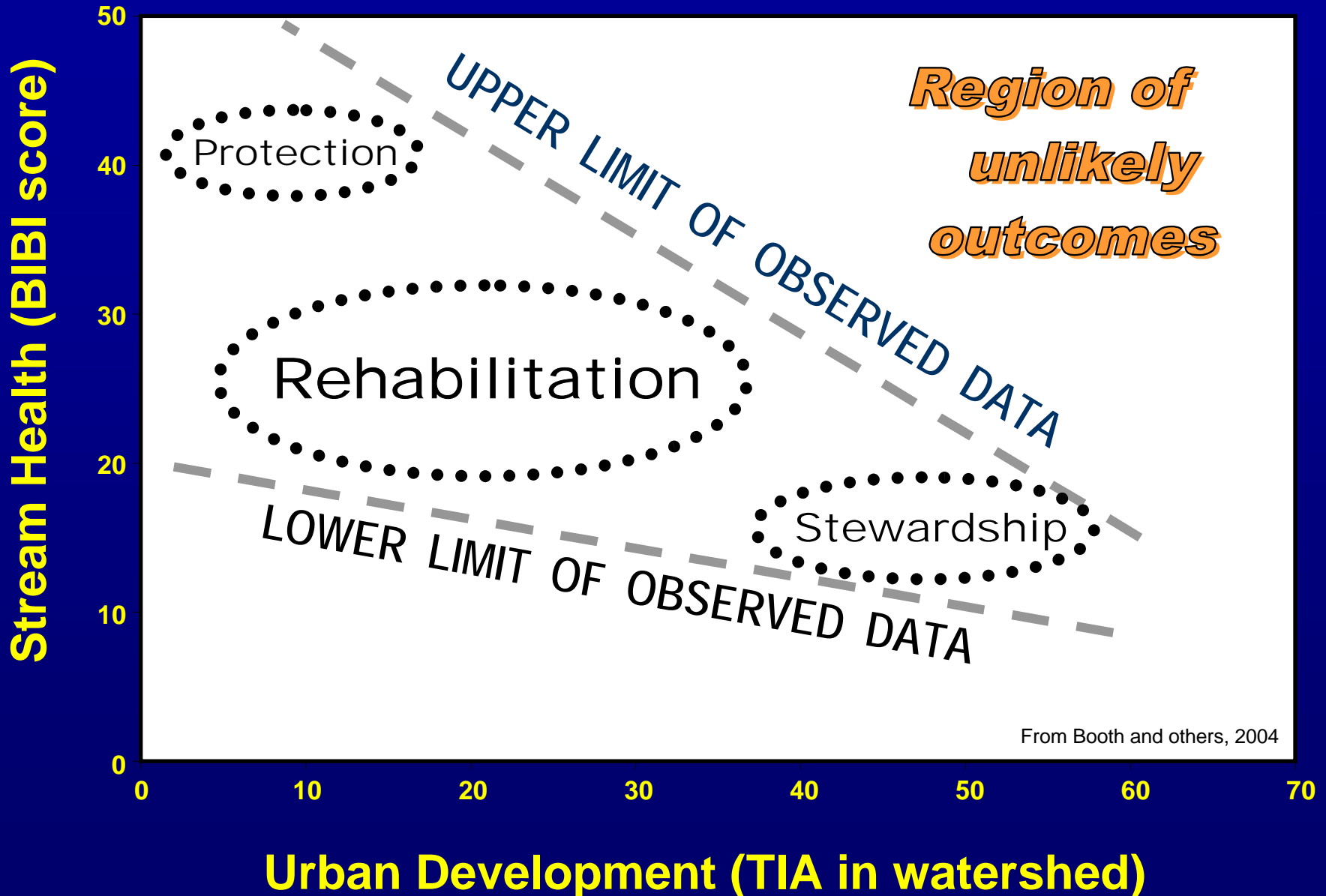
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Biological Integrity of Puget Lowland Streams



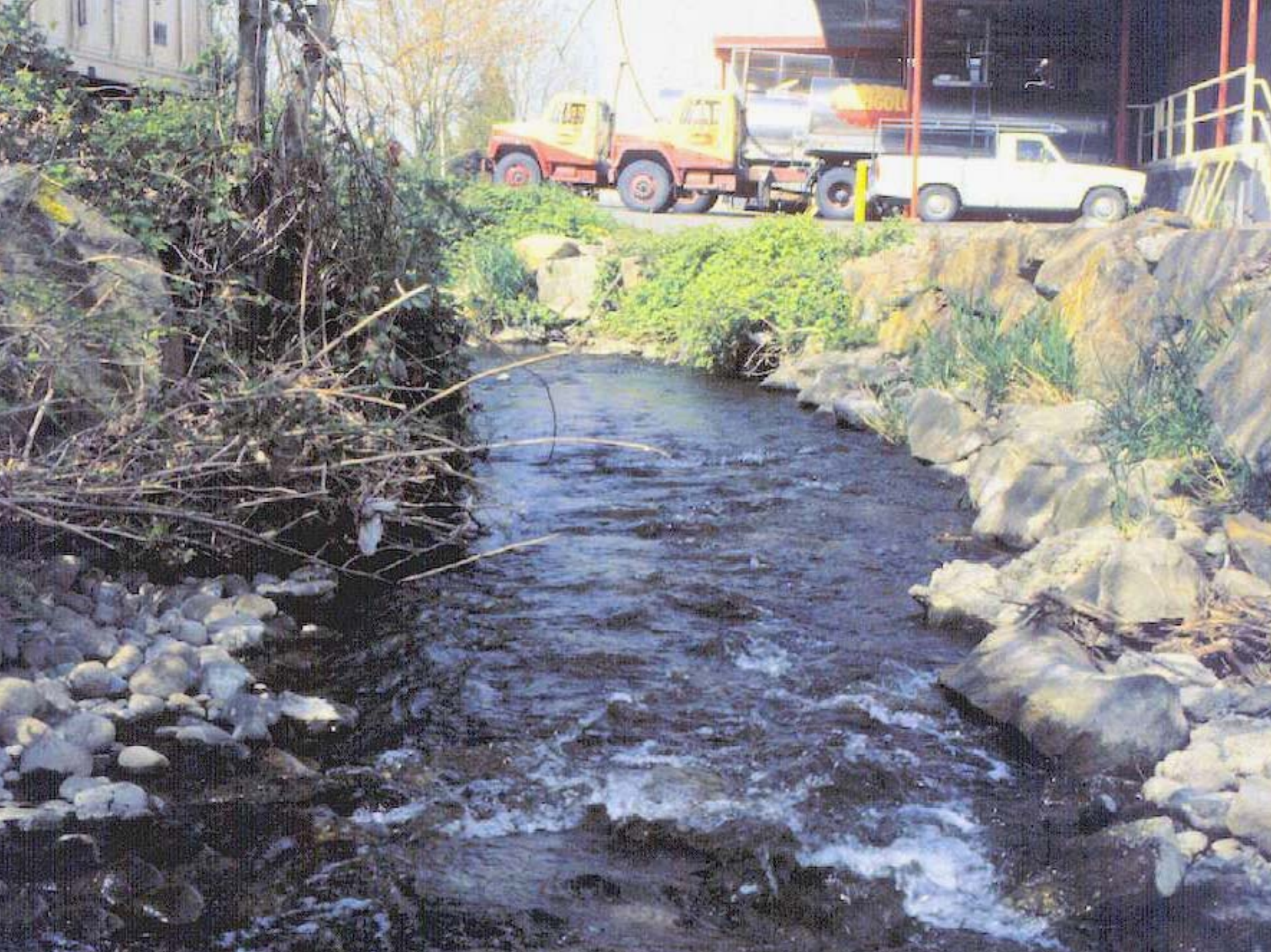
Management Strategies



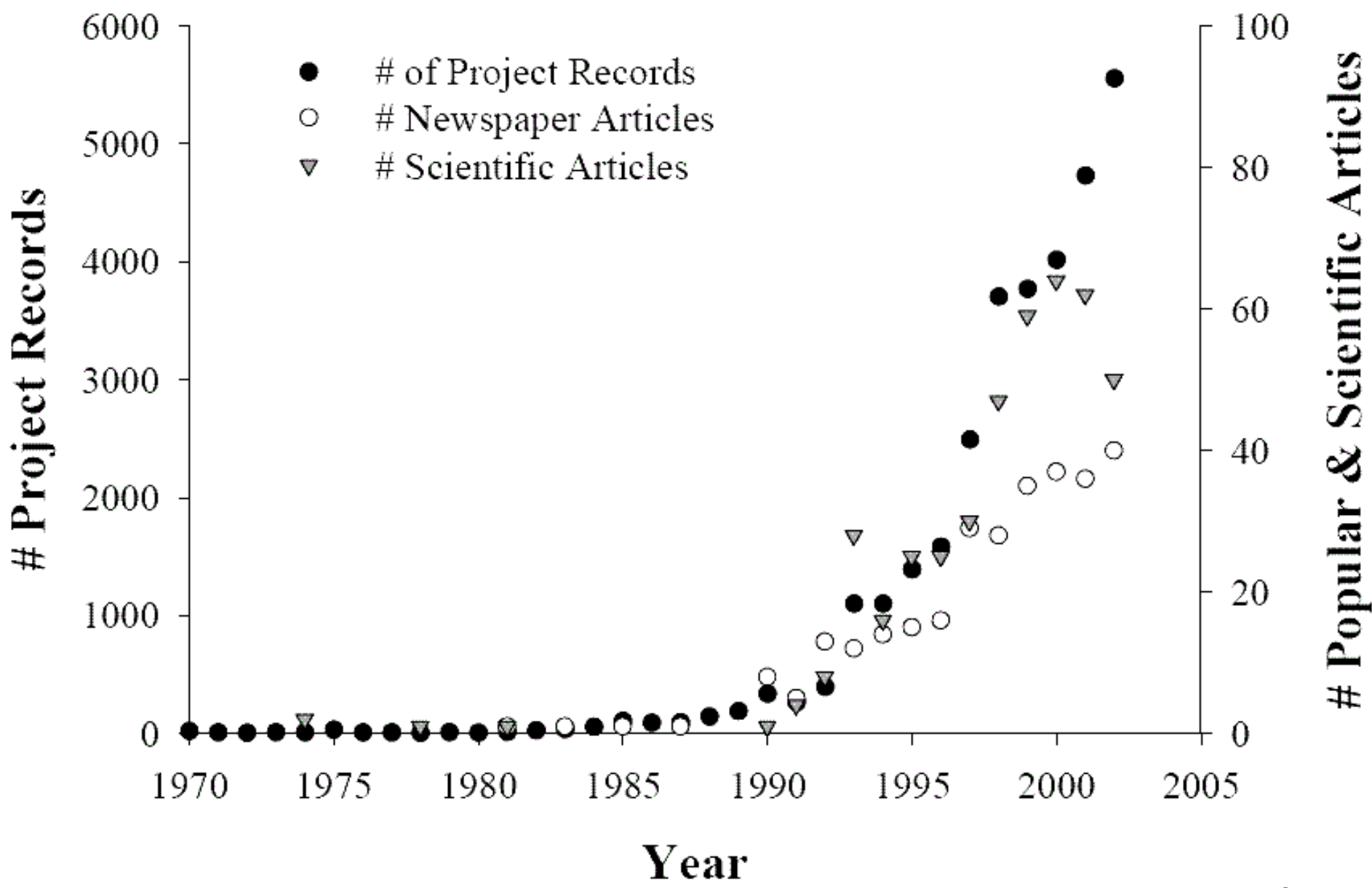
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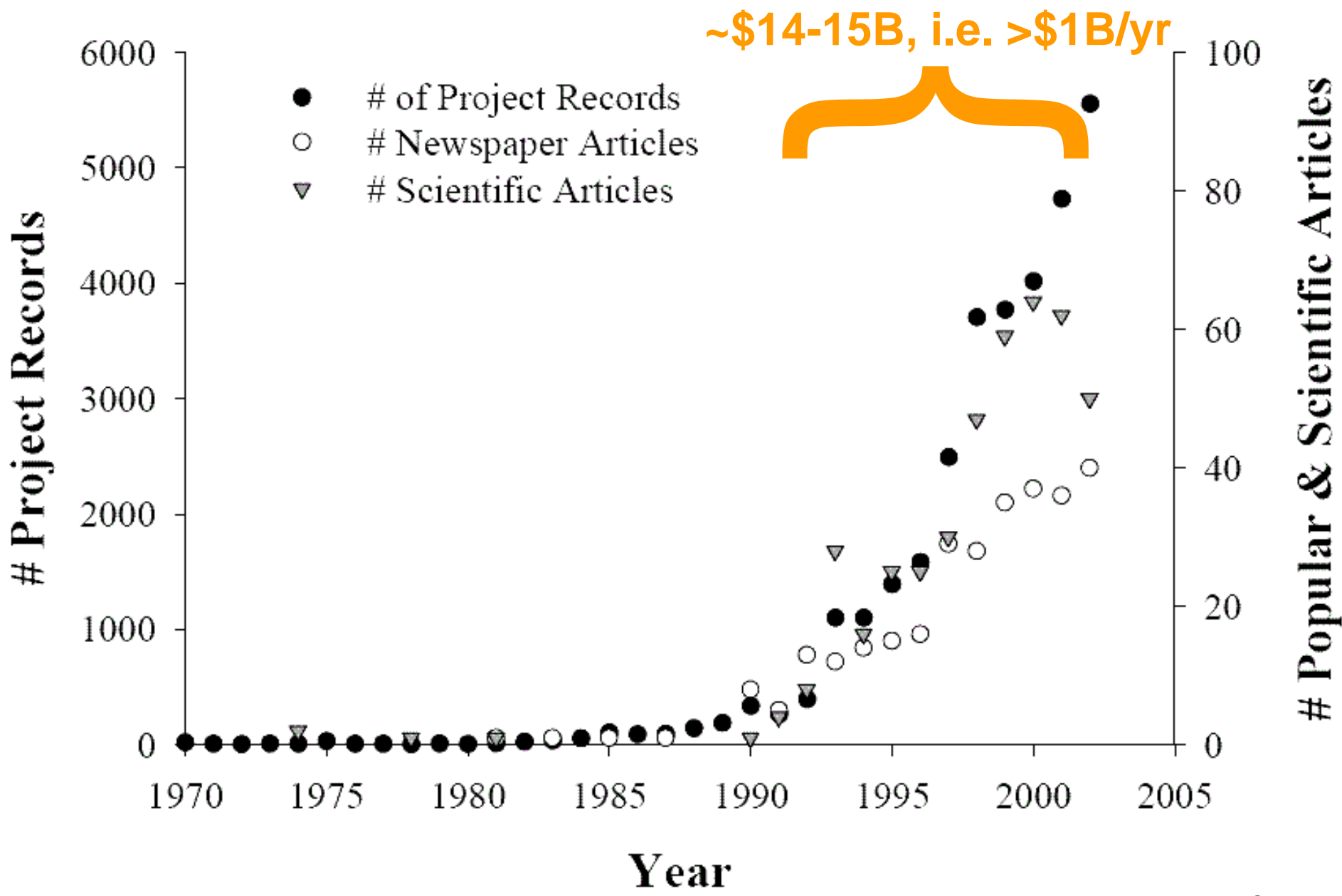
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From Bernhardt et al., 2005, Science

“However, just as rivers are in need of restoration, so too are the art and practice of restoration itself.” (Palmer and Allan, 2006)

Are we doing our jobs?

North Carolina Stream Restoration Institute River Courses

Spring, 2006, Raleigh, NC (Lake Wheeler Training Center)	Fall, 2006, Asheville, NC (NC Arboretum)
Section I. Stream Classification and Assessment March 21-23, 2006 Full	Section I. Stream Classification and Assessment August 14-16, 2006
Section II. Stream Restoration Design Principles April 11-13, 2006 Full	Section II. Stream Restoration Design Principles August 28-30, 2006
Section III. Advanced Stream Restoration Design Principles May 23-25, 2006	Section III. (Not offered in Asheville)

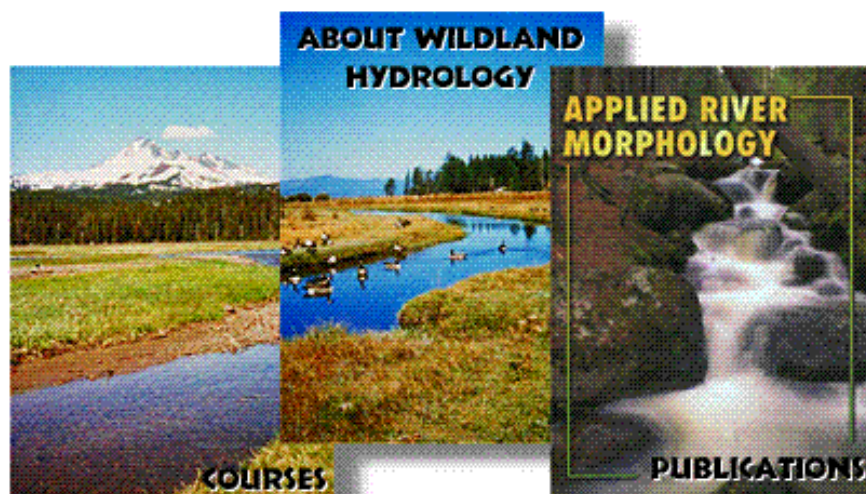
[Click here](#) for course descriptions and to view past PowerPoint presentations.



Course
Registration Form

Book Order Form

Wildlandhydrology.com



[Links](#) to Other
Hydrology Sites

Wildland Hydrology

11210 N. County Road 19

Fort Collins, CO 80524

Phone: 970-568-0002

Fax: 970-568-0014

E-mail: wildlandhydrology@wildlandhydrology.com

[Courses](#) | [About Wildland Hydrology](#) | [Publications](#) | [RIVERMorph](#)



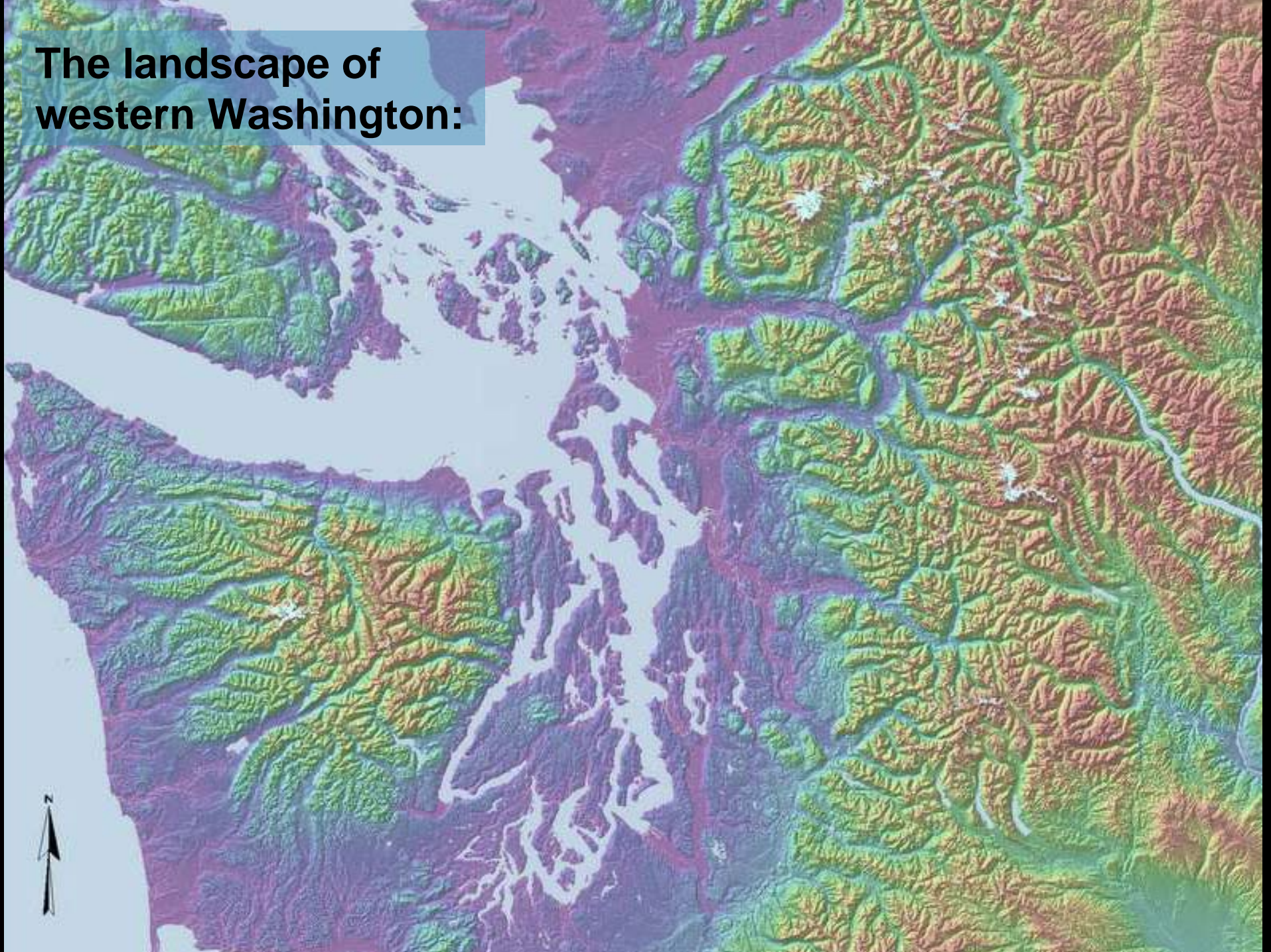
E-mail: wildlandhydrology@wildlandhydrology.com

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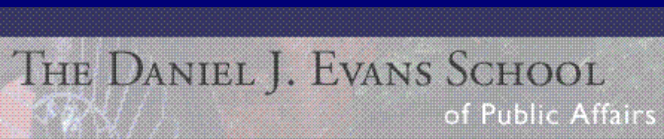
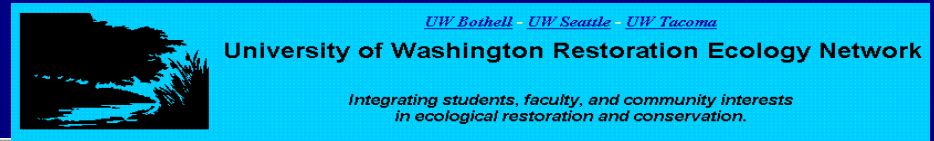
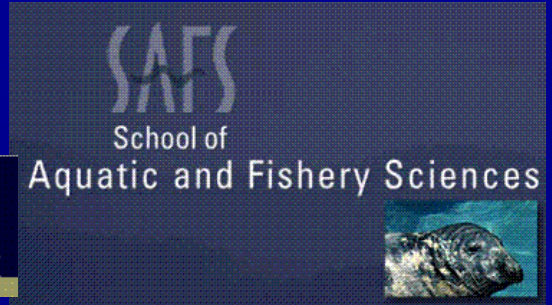
The landscape of western Washington:



The diversity of expertise at the University of Washington

UNIVERSITY OF WASHINGTON
COLLEGE of ENGINEERING

A Community of Innovators



The expectations of others *about* the University of Washington:

From the University of Georgia

(<http://www.arches.uga.edu/~esudduth/generallinks.html>)

Some university programs with research on stream restoration:

University of California-Berkeley [Department of Landscape Architecture and Environmental Planning](#)

Colorado State University [Department of Civil Engineering Stream Restoration Program](#)

University of Georgia [Institute of Ecology](#) and [River Basin Science and Policy Center](#)

University of Idaho [Department of Civil Engineering](#)

University of Maryland [Graduate Program in Behavior, Ecology, Evolution, and Systematics](#)

University of Michigan [School of Natural Resources and Environment](#)

Monash University, Australia [School of Biological Sciences](#)

University of Montana [Flathead Lake Biological Station](#)

University of New Mexico (and University of Alabama) [Freshwater Sciences Interdisciplinary Doctoral Program](#)

North Carolina State University [Stream Restoration Institute](#)

University of Washington [Center for Urban Water Resources Management](#) and [Center for Streamside Studies](#)

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...to graduate Masters-level students at the University of Washington trained in the principles and practice of river restoration.



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Ok, but what about....

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Ok, but what about....

- Why not broader than “just” rivers?
- Why not undergraduate, too?
- What about continuing education?
- Why not Ph.D. level?
- Is this a thesis or 5th-year coursework degree?
- What about existing, overlapping programs?
- Where is the money to support this?

Elements of the proposal:

- Course work
- Field experience
- Internship opportunities
- Communication skills

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- Course work
- Field experience
- Internship opportunities
- Communication skills
- Humility



Autumn
1989



Winter
1990



Spring
1998



“Report on 2003 Survey of River Restoration Professionals”

([http://www.rrnw.org/RRNW Survey Report03.pdf](http://www.rrnw.org/RRNW_Survey_Report03.pdf))

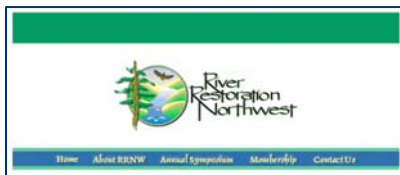
- 161 respondents (53 private, 98 govt., 10 academic)
- 46 biologists, 58 engineers/geologist, 57 other

TABLE 3.6.2 DESIRED PROFESSIONAL DEVELOPMENT TOPICS BY PROFESSIONAL GROUP (329 RESPONSES)

Category	FISH	COORD	HYDRO	CE	WRE	ACAD	PRINC	LSA	PLANTS	COMPL	Total
Geomorphology	21	16	5	9	6	5	4	3	2		71
Restoration	9	6	9	4	4	5	6	1	2		46
Sediment	3	2	3		5		2	2			17
Monitoring	4	2	3	1		3		1			14
Hydrology	8	2		2				1			13
Construction	6		2		2		1		1		12
Ecology	5	1		1		1	1	2		1	12
Fish		1		5	2	2	1	1			12
Geography	5	2	3		1	1					12
Plants	5	3	1	2	1						12
Communication	6	2	2			1					11
Regulation	2	1		2	3		2	1			11
Civil Engineering	9					1					10
Modeling	2	1	2	1	2	1				1	10
Project Management	2	3	4								9
Soils		2		5	1						8
Hydraulics	3	1	2			1					7
Geology	1	2			2						5
Interdisciplinary Skills	1		2		1	1					5
Math	2	1	1	1							5
Planning	1	1		1			1				4
Field Skills	2		1								3
Funding	1	1				1					3
Natural History	1			1			1				3
Water Resources		1	1	1							3
Chemistry			2								2
Forestry	1			1							2
Wetlands	2										2
Watershed	2										2
Biology		1									1
Economy	1										1
Photography	1										1
Total	106	52	43	37	30	23	19	12	5	2	329

Recommended courses, 2003 (for professional development; in rank order):

- Geomorphology
- Restoration
- Sediment
- Monitoring
- Hydrology
- Construction
- Ecology
- Fish



CURRICULUM QUESTIONNAIRE

Dear 2006 Stream Restoration Design Symposium attendee: |

The University of Washington is exploring the both undergraduate and graduate degree programs in environmental restoration. As part of this exploratory stage, we are soliciting input from government, consulting, and academic professionals on the knowledge and skill sets they would like to see from a university graduate at each of these degree levels.

The following courses are represented at various national and international programs that are already in existence. Please take a moment to share your preferences and suggestions for the creation of an Environmental Restoration degree program by checking the boxes of classes that you would like to see offered in this region, or by suggesting other courses. If you are early in your career, what courses did you take that were particularly useful? What did you wish you had taken? If you've been at this for a while, what kind(s) of academic background are you seeking in your new hires? What do you *still* wish you had taken (or been able to take) as a student?

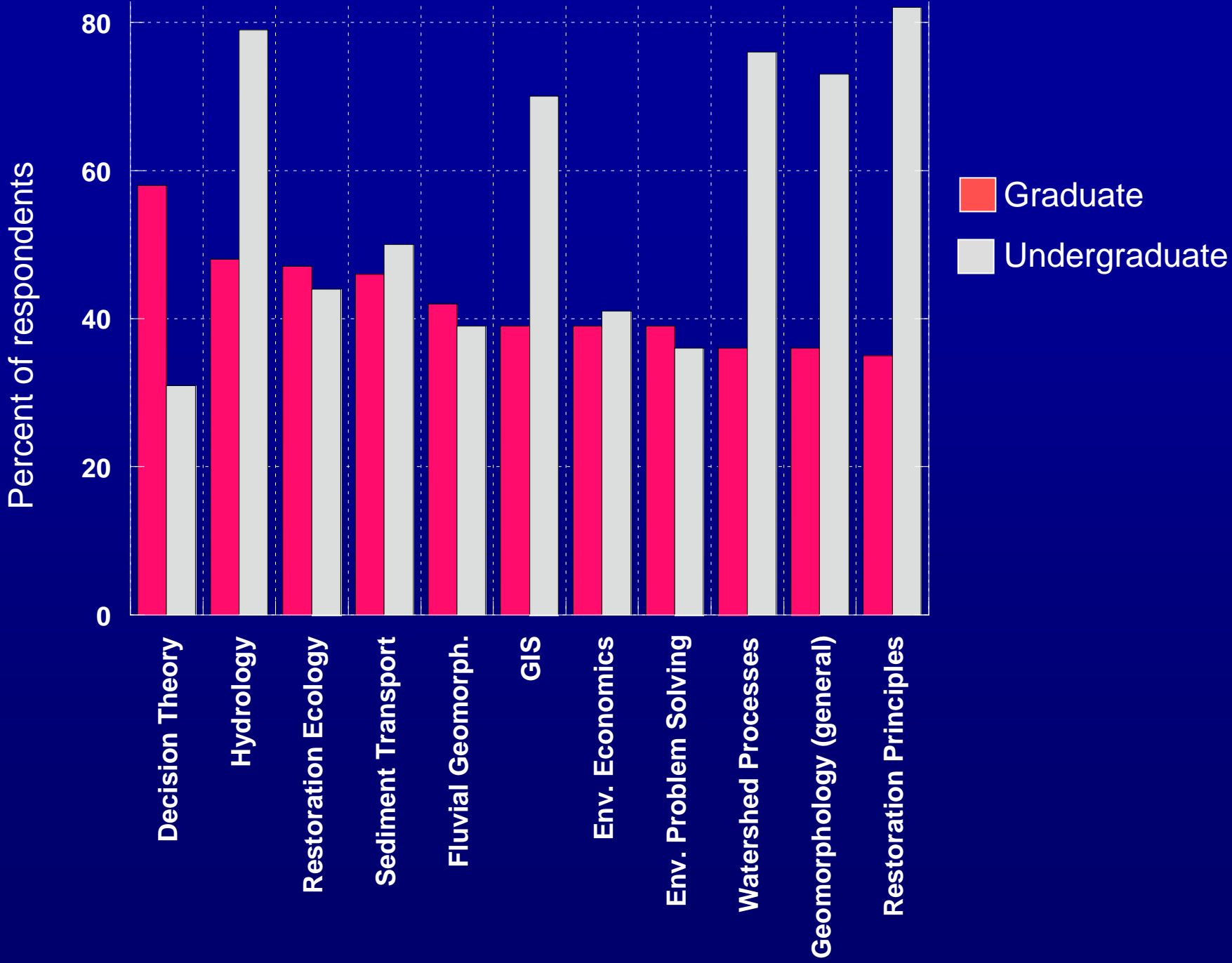
Please return these forms to Derek Booth or in the labeled box at the registration desk. Thanks!

I am (check one): Academia Govt/Tribal Private/Industry NGO

COURSE	Undergrad degree		Graduate degree	
	Mandatory	Elective	Mandatory	Elective
GENERAL/POLICY				
Restoration Principles and Concepts				
Restoration of Aquatic Systems (freshwater)				
Restoration of Aquatic Systems (marine)				
Restoration of Forests				

Recommended courses, 2006 (for graduate degree program; in rank order):

- Risk Analysis and Decision Theory
- Hydrology
- Restoration Ecology
- Sediment Transport
- Fluvial Geomorphology
- Geographic Information Systems (GIS)
- Environmental Economics
- Environmental Problem Solving



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How close are we now?

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- Hydrology
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How close are we now?

- ✓ Risk Analysis and Decision Theory
- ✓ Hydrology
- ✓ Restoration Ecology
- ✓ Sediment Transport
- ✓ Fluvial Geomorphology
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- ✓ Environmental Economics
- ✓ Environmental Problem Solving

How close are we now?

Close, but...courses are located in units that may not even know that they are potentially part of a “River Restoration” program:

- Civil and Environmental Engineering
- Earth and Space Sciences
- Forest Resources
- Oceanography
- Evans School of Public Affairs
- Urban Design and Planning
- Economics

What's needed now?

What are the next steps?

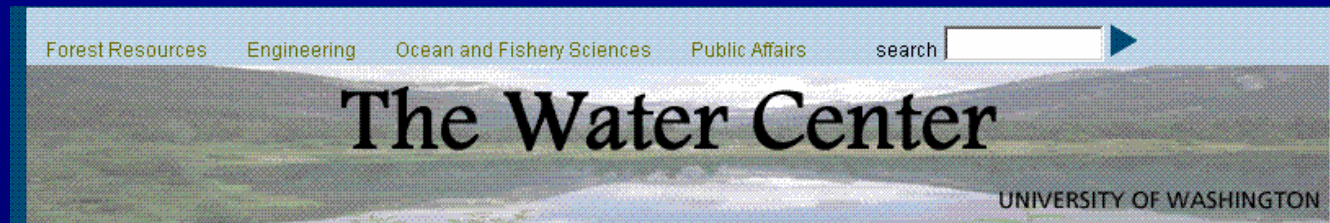
1. Awareness that the effort exists
2. Suggestions (supportive, depreciating, whatever)
3. Participation

**REPORT IS PLANNED FOR JUNE 2006—
A path for implementation (or not)...**

<http://depts.washington.edu/cwws/streams.html>



With thanks to the current supporters of this exploratory effort:



<http://depts.washington.edu/cwws/streams.html>