
PRESIDENT'S NOTES

by Teresa J. Platin, CH2M Hill, President, AWRA Washington Section

The months of May and June are bursting with AWRA activity. Leading the exciting program is the AWRA Student/State Section Joint Social, a complimentary appetizers and happy-hour social to be held on May 18 from 5:30 to 8:30 PM. This is a special complimentary event open to members of the Washington Section of the American Water Resources Association only. The gathering, held at the University of Washington's Waterfront Activities Center, features guest speaker Dr. Thomas Quinn from the University of Washington Department of Fisheries. We have also arranged for a "Brown-Bag" lunch meeting on May 19th from 11:30 a.m. to 1:30 p.m. at Perkins-Coie in Seattle. Dr. Peter Spillett of Thames Water, International will discuss restoration and revitalization of the Thames River through oxygen infusion, acoustical screens, and habitat restoration. Lunch will be provided, but reservations are necessary. All members should have received invitations for both events by now.

The State Section has made great progress on both the Annual State Conference and the National Fall Conference. Program brochures for the June 23, 1999 Annual Conference have been mailed out, and the event is shaping up well. Abstracts submitted for the December 4-9, 1999 National Conference are to be reviewed in June, and the program will be finalized after that. The call for abstracts deadline is June 1, so get your's in now. The Board would like to extend special thanks to the volunteers continuing to help with the many committees that shape AWRA. We have been very fortunate this year to have the assistance of **Rob Long** of Golder Associates, **Naomi Chechowitz** of WSDOT, **Steve Foster** and **Bob King** of HDR, and **John Hoey** of CH2M HILL. Other volunteers have also expressed an interest in helping, and we welcome them to attend one of our monthly Board meetings. We look forward to seeing you at an upcoming event. ~~~

Common Flaws to Avoid in Biological Assessments

The Washington State Department of Transportation has been involved in reviewing a number of early examples of Biological Assessments (BAs) and has noted the following common deficiencies. Addressing these issues will help facilitate a more efficient concurrence process.

1. Lack of a vicinity map - make sure a legible map is included, and describes where water bodies are.
2. Failure to obtain all of the species listings and include copies in the BA.
3. Failure to discuss if the species are in the area - is the habitat used by the listed species? Is there suitable habitat for species within the project area?
4. Lack of justification for the effect determination. You must make an effect determination for each listed species and you must provide supporting evidence/justification for why the effect was made.
5. Be sure to explain activities, don't assume the reviewer is familiar with the project. For example, to a biologist channelization means we are straightening and ditching the stream. To an engineer, channelization has a significantly different meaning.

6. Provide a complete project description and a complete discussion of impacts, or lack of impacts for a no effects letter. Address the creation of new impervious surface, the type of stormwater treatment that will occur, impacts to the riparian habitat, and be very clear about what BMPs will be used.

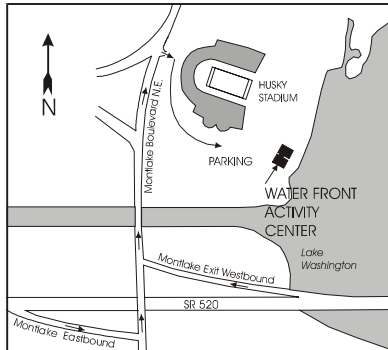
7. Remember to use the correct terminology for effect calls: For listed species, make an effect determination for each species consisting of either "no effect", "may affect, not likely to adversely affect", "may affect, likely to adversely affect", or "beneficial effect".

For proposed species make a jeopardy call (remember that a jeopardy call is for the species as a whole and not for an individual or individuals of a species population) and a conditional effect determination. For example, "this project is not likely to jeopardize the continued existence of Hood Canal summer chum salmon," or "if the species becomes listed, this project may effect but is not likely to adversely affect this species."

For candidate species and species of concern, make an impact statement. ~~~

"The Ecology and Conservation of Pacific Salmon"

The Waterfront Activities Center is located on the south side of the University of Washington campus



Parking is available for \$2.50 per vehicle, on the southeast side of the Husky Stadium

This special event is offered only to members of AWRA. Complimentary hors d'ouvres and beverages will be served.

We appreciate your membership!

Are Pacific salmon the "canary in the mineshaft" – fragile indicators of declining ecosystem health, or are they a resilient group of animals that have persisted in spite of myriad sources of human-induced mortality? This talk examines the life cycles of Pacific salmon, emphasizing their vulnerability and their resilience, in an effort to stimulate discussion on what it may take to retain their role in our region's ecosystems.

A Presentation by
Dr. Thomas Quinn
Professor of Fisheries
Univ. of Washington
Tuesday, May 18, 1999
**UW Waterfront
Activities Center**
5:30 p.m. – 8:30 p.m.

Due to space limitations, this event will be open to only the first 70 AWRA members to respond. Please call or send the registration form to:

Kurt Marx
Dept. of Civil Engineering,
University of Washington
Box 352700
Seattle, WA 98195
(206) 616-9145 or
(206) 632-2987,

or email at
marx@u.washington.edu

This event is open to members of the Washington State Section of the AWRA only.

New Report: "The State Role in Western Watersheds"

Reviewed by Rod Sakrison, Department of Ecology

"The State Role in Western Watershed Initiatives" prepared by the Natural Resources Law Center (located at University of Colorado - Boulder) describes efforts by states to implement watershed initiatives for resource management. This report is particularly timely for Washington Section members since we are hosting the AWRA National Conference in Seattle this December on watershed management and endangered species.

The management of water resources in the American West raises a number of unique and complex challenges. Among these are the difficulty of coordinating diverse public and private interests and promoting water resources governance from a regional and integrated perspective. One of the most striking and innovative characteristics of water management in the 1990s is a renewed interest in local, generally sub-state watersheds as the preferred administrative unit. Many western states are recognizing the potential of these groups to successfully address a host of water-related problems.

The report reviews the historical and ideological context for state involvement in watershed management, describes current state approaches to supporting the formation or continuation of local watershed groups, and provides general recommendations to policy makers and watershed groups for future actions. The report describes state legislative and agency strategies for encouraging and supporting watershed initiatives in Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Copies of the full report (RR18) can be purchased for \$15 (plus \$4 postage) by contacting:

NRLC, Univ. of CO School of Law
Campus Box 401
Boulder, CO 80309-0401
(303)492-1272, (303)492-1297 (fax)
NRLC@Colorado.edu

More reports along a similar line are available at:

<http://www.den.doi.gov/wwprac/reports/west.htm>.



Weyerhaeuser-Everett Water Right Transfer

by Chris Pitre, Senior Hydrogeologist, Golder Associates

The Weyerhaeuser water right in the City of Everett is among the major future potential regional water supply sources for the Central Puget Sound region. This article reviews the water right application currently pending before the Washington Department of Ecology. This right was originally granted for the diversion of 36 million gallons per day (mgd) from the Snohomish River system (at Ebey Slough) for manufacturing use, and was used by Weyerhaeuser at their Everett facilities until those operations were closed in 1992. In 1996, the Snohomish Regional Water Authority (RWA), consisting of Everett, Northshore Utility District, and the Woodinville Water District, acquired the water right. This review is based on the executive summaries of the Plan of Use and the Extended SEPA checklist prepared in support of the water right application.

The application for this water right seeks to establish an annual withdrawal rate (Qa) of 28.7 mgd to reflect the historical maximum use, to transfer the purpose of use from manufacturing to municipal, and a change in the point of use from the old Weyerhaeuser facility to the service area of the RWA. Proof of perfection for a historical maximum instantaneous extraction rate (Qi) of 36 mgd was submitted in 1969.

A plan of use was submitted to Ecology in 1996, four and one half years after Weyerhaeuser stopped using water regularly in its Everett operations. Ecology accepted this "determined plan of future use" and stopped the clock with respect to relinquishment after five years of non-use, pending the Agency's decision and/or completion of development activities. Water is occasionally run through the old Weyerhaeuser system to ensure the effective operation of its water system.

The Snohomish River Estuary is a very complex environment due to tidal influences, multiple waste water treatment plant discharge points, and upstream agricultural runoff. Under certain tidal and flow conditions, water quality in the lower reaches of the river system and estuary is challenged with respect to temperature, dissolved oxygen, and fecal coliform. These conditions are in part a result of natural conditions that are aggravated by waste water discharges and agricultural runoff. In exercising the water right, the RWA intends to reduce use during extreme conditions that could cause water quality impacts above unacceptable levels.

Upgrades to fish screens at the intakes are proposed that will be a significant improvement over existing facilities. Other predicted impacts to fish habitat are characterized as immeasurable and/or inconsequential. Although the documentation acknowledges the sensitivity of salmonid species, how this water right will be addressed within the context of the Endangered Species Act (ESA) is unclear.

An indication of the level of effort required by today's applicants for water rights is reflected by the documentation submitted in support of this application for change. In January, 1998, a revised and amended plan of use was submitted along with an expanded SEPA checklist (over ½-foot thick). Numerous consultations have been undertaken between the RWA and Ecology. The RWA has provided a significant level of analysis and documentation in support of the change application to address anticipated concerns of stakeholders.

Other entities that may have an interest in the fate of this water right include the Tulalip Indian Tribe, the National Marine Fisheries Service, and other players in regional water supply such as the Cities of Seattle and Bellevue and members of the Cascade Water Alliance.

Projected demand growth, combined with difficult prospects for developing additional regional municipal supply, make securing future water supply a high priority for public agencies responsible for providing water. Inclusion of the Weyerhaeuser source in Central Puget Sound regional planning efforts may allow additional options to be considered and greater flexibility in regional operations to address both water demand growth and the ESA listings.

Other major regional future water supplies that are currently considered promising are:

- Auburn Well Field – 10-20 mgd
- Snoqualmie Aquifer – 20-40 mgd
- Tacoma Pipeline #5 – 50 mgd

With each passing water right decision that is made in the State of Washington, new precedents are established, and the complexity of the arcane system of allocating water rights in this state is increased. Decisions made with respect to the change in the Weyerhaeuser water right will be looked at by all participants in the water rights game as an indication of how to proceed with their own strategies. ~~~

Large Trout, Weather Cooperate For Lake Fishing Opening Day

OLYMPIA– Lots of trout and good weather across much of the state made April 26 opening day of the lowland lake fishing season memorable. As a result of the blue skies and calm waters, record numbers of anglers turned out in some parts of the state, especially in the Spokane and Olympia areas. Fishing was so good many anglers also released many of the trout they caught. Many of the lakes also produced trout planted last year that had grown as large as 28 inches for Saturday's opener. ~~~

Wetland Treatment Project, City of Stanwood

by Kurt Marx, President, AWRA University of Washington Chapter and Margaret McCauley,
Recipients of the WA AWRA 1998 Student Fellowship

Wetlands are an important link in the management of water resources due to their ability to protect or enhance water quality and to maintain hydrologic balances. Treatment wetlands are one technology in the growing field of ecological engineering, which applies ecological knowledge along with engineering to meet society's needs while minimizing environmental impacts. The coexistence of aerobic and anaerobic environments in wetlands supports a diversity of microbes and vegetation with minimal human intervention and energy input; thus, wetland systems have become an appealing water treatment option.

The Clean Water Act of 1977 encouraged the development of alternative water handling technologies. Since then there have been a growing number of wetland treatment systems in the U.S.A.. Currently wetlands are being used to treat a variety of water types and contaminant loads in many countries. Treatment wetlands have been designed, constructed, and operated to treat various wastewaters: municipal wastewater, acid mine drainage, urban and agricultural runoff, landfill leachate, and industrial wastes. Besides improving water quality, treatment wetlands also provide ancillary benefits including wildlife habitat, natural aesthetics, and non-contact public use (bird watching for example), among others. Due to a growing awareness of both the importance and the threatened status of natural wetlands, most treatment wetlands are constructed systems—built in areas that were previously terrestrial.

The role of sewage in the eutrophication and degradation of receiving waters has been well established; thus, wastewater treatment has become standard in the U.S.A. and most of the developed world. In small communities, where the increasingly capital-intensive treatment facilities originally developed for large metropolitan areas are not always feasible, a need remains for cost effective treatment methods. Treatment wetlands tend to require lower operation energy and maintenance as compared to traditional wastewater treatment processes. Typically, the goals of municipal wastewater treatment are to remove biochemical oxygen demand (BOD), total suspended solids (TSS), and pathogens. Nutrients, primarily nitrogen (N) and phosphorus (P), are also becoming regulated. Treatment wetlands often provide effective removal of BOD, TSS, and pathogens; however, nutrient removal efficiencies can vary dramatically.

Stanwood's Green Treatment (Kurt Marx). In 1993, the City of Stanwood, Washington, funded in part by a Washington Department of Ecology Centennial Clean Water Fund Grant, installed a free water surface wetland to demonstrate the effectiveness of treatment wetland technology. The treatment wetland was built in an existing 1.25-acre lagoon at the Stanwood municipal treatment facility. Impetus for the treatment wetland was to

reduce loading to and subsequently increase the performance of the existing treatment train – an aerated lagoon followed by a 35-acre facultative lagoon. A treatment wetland reflects the community's desire to both maintain a natural environment and handle the infrastructure demands of a larger population.

Wastewater plant influent flow ranges from 0.25 MGD in the summer to 0.5 MGD in the winter. Approximately eight percent of the facility's influent flow is diverted to a partially aerated lagoon. Effluent from this lagoon is fed to four parallel treatment wetland cells in a flow ratio of 1:2:3:4. Each cell consists of a marsh segment and a wet meadow segment in series, each approximately 33 ft. wide and 120 ft. long. The marshes contain predominately *Scirpus acutus* (hardstem bullrush). Vegetation in the wet meadows consists mainly of *Juncus effusus* (soft rush), *Phalaris arundinaceae* (reed canary grass), and *Typha latifolia* (cattail).

Treatment wetland effluent is pumped to the City's facultative lagoon. The facultative lagoon discharges into a low-flow reach of the Stillaguamish River. Due to a diversion of significant upstream flow into Hat Slough over 40 years ago, this downstream estuarine reach does not receive adequate flow for flushing. Except during very wet times, the reach is more of a tidal bay instead of a river system. For this study, particular attention will be paid to ammonia removal due to its toxicity to aquatic organisms and the increasing regulation of ammonia in municipal wastewater treatment effluents.

As my Master of Science degree project, I monitored the treatment wetland system for 12 months to investigate its capability to decreasing biologically available nitrogen and phosphorus. From this study, conclusions will also be made on the design and operation of Pacific Northwest constructed wetlands treating sewage lagoon effluent. Specific objectives of the project as set forth by the City of Stanwood and Department of Ecology in the Monitoring and Quality Assurance Project Plan include:

- To demonstrate that a marsh/wet meadow constructed wetland can upgrade water quality in receiving waters by reducing concentrations of organics (BOD), solids (TSS), and nutrients in sewage lagoon effluent;
- To demonstrate that constructed wetlands should be included in the AKART (All Known and Reasonable Technology) category by [The Department of] Ecology, so that they can be used as part of an alternative to conventional treatment processes to protect water quality;
- To establish preliminary design and operating criteria for marsh/wet meadow constructed wetland systems.

The above objectives are being met by monitoring water quality, flow rates, and weather parameters. Monthly nutrient removals quantified include ammonium, nitrate and nitrite, and total phosphorus. BOD and TSS are determined weekly. Cell 1, with the lowest hydraulic loading, has performed best, with an average 84% reduction in ammonium concentration. Cells 2, 3, and 4 reduced ammonium concentrations on average by 38%, 46%, and 13%, respectively. Investigations are underway to determine how to maximize ammonium removal in the cells with higher loadings.

So what are those plants doing? (Margaret McCauley). Despite their practical purpose, treatment wetlands operate by natural principles, and site-specific fine-tuning is required. The necessity for regional models and databases has slowed acceptance of wetland technology; conventional indoor systems require a much simpler set of parameters and operate the same way regardless of location. Regulatory agencies have also been hesitant to fully license wetland treatment systems due to the gaps in knowledge about what determines system effectiveness.

Water quality is a useful tool for determining *whether* a system is performing as desired, but it can be harder to determine *why* a system is or is not performing up to standards. Such systems are less capital-intensive, yet harder to adjust. For example, what does the operator tweak to bring the ammonia level down from 6 to 2 mg/L? As the number of trial systems increases, some of the pertinent parameters are being more clearly defined, yet numerous questions remain. A fundamental issue that needs clarification is the role of plants in treatment effectiveness.

The basic question is "Do the plants really matter?" Most studies have concluded that although there is some nutrient uptake by plants during the growing season, the bulk of the nutrient and pollutant degradation and transformation is done by microbes which use plants as substrate, and not by the plants. Harvesting the plants removes nutrients in the form of biomass, but reduces treatment effectiveness while the plant population is temporarily decimated. Harvesting increases labor requirements, and is a difficult task in most surface waters. For these reasons, few treatment systems include harvesting in their routines.

There have been relatively few comparisons of specific species within a given system, perhaps because design of these treatment wetlands has been largely the domain of engineers rather than biologists. Nonetheless, when these sorts of wetlands are planned, there tends to be a real push for use of certain plants over others. Some designers use monocultures of one plant for conceptual consistency, and others try to use a variety of plants to

increase the habitat value of the system. Controlling the plant and animal populations can be problematic, however, and it is not clear whether such control is necessary.

The usual assumption in wetland construction and restoration projects—that native plants will be more adapted to the local conditions—may not actually apply to wastewater-supplied wetlands. A wetland fed with sewage will have significantly higher levels of nutrients and organic matter than natural wetlands nearby. Many wetland plants are adapted to a pulsing water level and may not thrive under the continuous flow of a sewage treatment plant.

The cautious wetland designer would choose plants whose use and performance is well documented. This would lead to a very narrow range of options, and would not be a guarantee of success. The amount of information available for appropriate plant selection is not satisfactory from either an engineering or a biological perspective. The lack of certainty in design leads to management questions. If the plants chosen based on the literature or on habitat concerns do not establish well or are overrun by invasive plants, it can be unclear where the fault lies, or, in the second instance, whether it matters. The low maintenance appeal of wetlands technology can quickly become lost if regular weeding is required.

Is it necessary to maintain the plant species that were originally chosen? Is weeding required or is succession permissible? The City of Stanwood, Washington faces these concerns with their constructed wetlands.

My thesis project compares the water treatment effectiveness of *Schoenoplectus acutus* (hardstem bulrush) which was intentionally planted, with that of two volunteer species--*Phalaris arundinacea* (reed canary grass) and *Typha latifolia* (cattail). Monitoring consists of biweekly water quality analysis and a vegetation census. Water samples from the inflow and outflows of 10 experimental plots are being measured for BOD, TSS, ammonia and nitrate nitrogen, and total phosphorus. There are 3 plots of each species and one unplanted control plot. So far, it appears that there is not a statistically significant difference between the species, although the planted plots are distinct from the control. Data collection began in July 1998, and spring data will be important in reaching a comprehensive conclusion.

KCM, Inc. and Dr. Richard Horner designed the system and drafted the monitoring plan for the treatment wetlands. The University of Washington will continue monitoring until April 2000. Funding has been provided by the City of Stanwood, the Center for Streamside Studies at University of Washington, and by Dr. Mike Brett. ~~~

Huckle/Weinman

Thank You!

1999-2000 FELLOWSHIP ANNOUNCEMENT

The Washington State Section of the American Water Resources Association (AWRA) is seeking nominations for a 1998-99 Fellowship Award of \$1500. For the 1998 - 99 academic year two fellowship awards will be given. One award will be to a member of a Washington Section affiliated Student Chapter. The other award will go to a student enrolled in a graduate program at a college or university in Washington state. This fellowship is for a full-time graduate student completing an advanced degree in an interdisciplinary water resources subject. In addition to the \$1500, the award includes membership in both the State and National AWRA, a one-year subscription to the *Journal of the American Water Resources Association*, and admission to the Washington State Section Annual Conference.

Each department with qualified applicants may submit one nomination for the award. The application packet, limited to **five** pages, should include the following:

- 1. A brief letter of nomination from the department head;**
- 2. Completed Application Form;**
- 3. Statement of goals and objectives for graduate work;**
- 4. Detailed description of research interest; and**

Qualified students need to fill out the application form and prepare the additional information requested above and mail it to the address below. The letter of nomination may be mailed under separate cover by the department head or included with the applicant's package. Items two through four constitute the application package and must be prepared by the applicant. Nominations will be evaluated on the basis of:

- 1. The interdisciplinary nature of the course of study and research;**
- 2. The effectiveness of the response in communicating research objectives;**
- 3. The potential for application of the work to the current needs in water resources management; and**
- 4. The overall impression of the application package.**

Nominations must be received by **September 30, 1999**. The Fellowship Committee will evaluate the applications received and will recommend a recipient and two alternates (the second and third highest rankings) to the Washington Section Board of Directors. The Board will select the recipient by November 15, 1999. The winners will be notified as soon as the board approves the award. Special recognition will be given to the fellowship recipients at the State Section's annual conference in November.

The recipients will prepare an article describing their research for the Section newsletter.

For additional information call Stan Miller at (509) 456-3604, or e-mail him at: smiller@spokanecounty.org.

Mail all applications to:

Stan Miller, Fellowship Committee Chair
AWRA Washington State Section
1329 S. Ferris Court
Spokane, WA 99202

1999 -2000 AWRA Fellowship Application

The Fellowship

Each year, the Washington State Section of the American Water Resources Association (AWRA), each year, offers an annual Fellowship of \$1500 to full-time graduate students completing an advanced degree in an interdisciplinary water resources subject. Since 1998 two fellowship awards have been given. One award is to a member of a Washington Section affiliated Student Chapter. The other award goes to a student enrolled in a graduate program at any college or university in Washington State. In addition to the \$1500, the award includes a one-year membership in both the State and National AWRA, a one-year subscription to the *Journal of the American Water Resources Association*, and admission to the Washington State Section Annual Conference.

The information provided in the following application will help the Fellowship Committee select this years fellowship recipients.

Personal Information

The following information will allow us to contact you to obtain additional information on your application or proposed work. It will also be used to notify you of your standing after the applications have been reviewed.

Applicant Name _____ Phone (____) ____ - _____ / (____) ____ - _____
Address _____

E-mail Address _____

Other information that might help us contact you (e.g. work hours when you will not be at one of your listed phones).

Academic Background

Describe your previous academic experience below.

<u>Educational Institution</u>	<u>Area of Study</u>	<u>Degree Granted</u>	<u>Year</u>
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_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

1999 - 2000 Fellowship Application Page 2

Current Academic Program

Describe the program in which you are currently enrolled. This is the program which will be evaluated for purposes of the 1999-2000 fellowship award.

Educational Institution Area of Study Degree Expected Completion Date

Thesis or Dissertation Topic _____

Major Professor _____

Proposed Course Work

List the courses you have taken or plan to take as part of your degree program. Include the course grade for those classes you have completed.

Course Number Course Title

Grade

<u>Course Number</u>	<u>Course Title</u>	<u>Grade</u>
_____	_____	_____
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Final Application

For additional information call Stan Miller at (509) 456-3604.

Mail the completed Application and support materials to:

Stan Miller, Fellowship Committee Chair
AWRA Washington State Section
1329 S Ferris Court
Spokane, WA 99202

✍️ MARK YOUR CALENDAR FOR 2 AWRA EVENTS ✍️

1999 Annual AWRA State Section Conference

Impressions **of 1999 State Water Legislation**

WATER RESOURCES LEGISLATION IN THE 1999 SESSION

June 23, 1999

8:00 am to Noon

SAM (Seattle Art Museum)

With ESA listings looming, it's a watershed year for water issues in Olympia. Salmon recovery, instream flows, municipal water supply and growth, water conservation and reuse, permitting logjam, and water rights transfers are among the subjects on the legislative table this year.

Please join us for a half-day conference to sort out the results of the 1999 Legislature. Find out which bills made it, which didn't, and why. And learn what's really in those bills that passed. What do the new laws mean for local and state governments, industry, agriculture, salmon, and yourself? Speakers to be announced include legislators, lobbyists, and expert observers. Look for more information in upcoming newsletters and flyers. ☺

1999 Annual Conference

Watershed Management to Protect Declining Species

Call for Abstracts - Due June 1, 1999

This Call for Abstracts for the 1999 AWRA Annual Water Resources Conference has as its core themes:

- Endangered species,
- Watershed management, and
- Aquatic system restoration.

In addition, abstracts for other water resources management topics with relevance to the core themes are welcome. Abstracts are to be submitted by June 1, 1999 using the abstract submittal form available at:

<http://www.awra.org/meetings/Seattle99/call.htm>

A volume of Extended Abstracts of Conference Papers (maximum of four pages each) will be published for distribution at the meeting. Abstracts will be subject to review, acceptance, and editorial standards. Authors must submit the first draft of these extended abstracts by September 1, 1999. Further instructions will be provided upon acceptance of the contributed abstracts. Selected papers related to watershed management and species recovery will be published in a special series in the *Journal of the American Water Resources Association* (JAWRA) in mid-2000.

Conference Topics:

Species recovery under the Endangered Species Act involves the organized efforts of local and state governments, private industry and public interest groups as well as professional and political leaders. The 1999 AWRA Annual Water Resources Conference encourages individuals with knowledge in any of these topical areas to submit abstracts of papers for oral or poster presentations.

The preference for oral presentations is on actual, on-the-ground experience or scientific research related to species recovery, watershed management, and ecosystem restoration. Other professional and scientific papers that will be acceptable are those related to water resources planning and management techniques associated with core themes.

Suggested presentation topics :

Coordinated regional response to listing of threatened/endangered species •Watershed management, collaborative planning models and partnerships, role of watershed councils, politics of fish, assessing public attitudes toward watershed management, and environmental education •Fisheries management, limiting factors analysis, fish passage, hatcheries, and hydropower •Water policy, instream flow methodologies, and integrating policy and science at the watershed level •Habitat protection strategies in riparian, coastal and marine environments, lakes, and watersheds •Watershed assessment and hydrology, analysis of channel changes related to forest land conversions •Riparian ecosystem restoration, basic ecosystem functions at local and watershed scale •Community design strategies to reduce impacts of urbanization, sustainable and low-impact development •Water quality management, TMDL's, nonpoint pollution strategies for urban development, agriculture and forestry •Wildland hydrology and grazing management •Landscape analysis and geographic information systems •Also! Water Resources and the World Wide Web ☺

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This newsletter is a publication of the Washington Section of the American Water Resources Association. It is published bi-monthly or quarterly. This is a forum for members to share ideas and opinions; opinions expressed in the AWRA Newsletter are those of the authors and do not necessarily represent the official position of the WA Section of AWRA.

Reprints and circulation for non-profit purposes are allowed without additional permission if proper credit is given to both the source and the author.

Submissions are welcome for the May/June 1999 newsletter. The submittal due date is May 8, 1999. The editor reserves the right to make changes for reasons of length, grammar, legality or clarity. Contact Chris Pitre at (425) 883-0777, or send submittals directly via:

Internet Mail: cpitre@golder.com (most document/graphic formats are acceptable).

Recent newsletters are available on:
<http://earth.golder.com/waawra/>

What this State Section is All About!

The WA State Chapter of the AWRA fosters educational and professional development.

Student support is provided in the form of two annual student fellowships, sponsorship of a student chapter at the University of Washington, underwriting of a special meeting in the late spring hosted by the student chapter, and other subsidies.

Interorganizational support is fostered with local, interstate and international organizations.

A **bimonthly newsletter** is published containing in-depth analysis and editorials on current issues.

Several **dinner meetings** are held throughout the year providing good food and good company followed by a presentation by featured guests. **Brownbags** are organized on special issues as they arise.

The annual climax is a **Conference which will be held in June of this year**. The Conference is the principal funding vehicle for many Section activities, including providing financial support to the Section's Student Fellowship program.

A **dedicated board** of 15 members meets regularly to plan, organize and facilitate events.

The Washington Chapter has been selected to host the **1999 National AWRA Conference** in Seattle.

If you wish to learn more about your Section and/or wish to participate more in Section activities, you will be warmly welcomed. Please contact any of the board members listed in the side board to the left.

Meetings/Conferences

[Editor's note: Announcements of other organizations are included here. To include your announcement, contact cpitre@golder.com. Links to these organizations are provided through our web page at <http://earth.golder.com/waawra/>.

May 19, 1999. Perspective on Water Legislation in Washington State. Presentation by Sen. Karen Fraser, Senate Committee on Environmental Quality and Water Resources, Chairperson. WHS Dinner Meeting in Olympia. 6:00 PM. Location to be announced. ❧

May 19, 1999. Restoration/Revitalization of the Thames River. Presentation by Dr. Peter Spillett, Environmental Program Manager of Thames Water, International. AWRA sponsored event at Perkins Coie in Seattle, from 11:30 to 1:30. ❧

May 20, 1999. Extreme Flood Models for the Columbia River. Robin Kirschbaum, Golder Associates. ASCE Water Resource Committee Meeting. Brown and Caldwell, Seattle, 12 Noon to 1 PM. ❧

June 6-9, 1999. "26th Annual Water Resources Planning & Management Conference" Tempe, Arizona. Call for papers (due Aug. 1, 1998). American Society of Civil Engineers. ❧

June 19 or 26, 1999. Tour of Cedar River Watershed and Presentations on the Cedar River Habitat Conservation Plan, by Seattle Public Utilities Watershed Management Staff. WHS Meeting and picnic, final date to be announced. ❧

June 23, 1999. 8 AM to Noon. 1999 Annual State AWRA Conference. Water Resources Legislation in the 1999 Session. Seattle Art Museum. Seattle, WA. ❧

June 30 - July 2, 1999. Annual Summer Specialty Conference. Science Into Policy: Water in the Public Realm and Wildland Hydrology. Bozeman, Montana. Call for Papers. ❧

August 8-11, 1999. International Water Resources Engineering Conference. Seattle, WA. American Society of Civil Engineers. ❧

October 27-29, 1999. Confronting Uncertainty: Managing Change in Water Resources and the Environment. British Columbia Branch of the Canadian Water Resources Association. Vancouver, BC. Call for papers. ❧

December 5-9, 1999. "Watershed Management to Protect Declining Species" AWRA National Annual Conference. Seattle, WA. Sponsored by the WA Section of AWRA. ❧

August 1999 Dinner Meeting Announcement

The Washington State Section of the AWRA has scheduled its next dinner meeting for August 25, 1999. The topic of the speaker's presentation is tentatively planned to be "ESA and the Development of 4(d) Rules". The speaker will be announced in the next newsletter.

Please plan to attend this informative dinner. The dinner will be held at the Latitude 47 Restaurant, located on the shores of scenic Lake Union, near downtown Seattle. There is plenty of free parking. Pre-dinner socializing and a no-host bar will begin at 5:30 p.m. Dinner will be served at 6:15 p.m., followed by the presentation. We hope to see you there.

Pre-registration is requested. The cost is \$22.00 for State Chapter Members and \$25.00 for others. There will be a \$5.00 additional fee charged for registration at the door. Make checks payable to AWRA. Send them to AWRA Dinner, c/o Pete Sturtevant, Ch2M Hill, 777 108th Ave. NE, Bellevue, WA 98004.

Latitude 47 Restaurant is on the west shore of Lake Union at 1232 Westlake Ave. N., Seattle. Take the Mercer Exit from I-5. Turn north at the Westlake Ave. traffic light. The restaurant is on the right, ~½ mile after the turn. – Or download the map from <http://earth.golder.com/waawra/>. ❧

April Dinner Meeting Review

by Mike Wert, Shapiro and Associates

Is the Y2K "Millennium Bug" worthy of concern? If it is, what are the implications to the utility industry? Those who attended the April dinner meeting had an opportunity to meet Don LeMaster, CEO of TAVA/R. W. Beck, L.L.C., who discussed the nature and validity of various issues related to Y2K; how operational risks in the utilities industry are being evaluated and addressed; and results of some case studies involving Y2K drills. Thatcher Dean, Y2K Coordinator, and Ed Pierson, Water Supply and Treatment Manager presented an informative overview of Seattle Public Utilities' Y2K program.

Some 80 million computers around the world will soon attempt to process time- or date-specific information where the year is designated as "00." Computer systems, unless Y2K compliant, will interpret the date as 1900. If a date calculation occurs, erroneous output of "negative" dates that can not be recognized could be generated. Implications could range from a very minor nature to shutdowns of major operations. Don provided an overview of Y2K issues and concerns; strategic steps for reducing risk of computer system failures or misinformation; a snapshot at what utilities are doing and how seriously they are treating the subject; and results of some national and international Y2K compliance programs. In Don's opinion, the United States Senate, the Government Accounting Office, and other organizations have done a very credible job in identifying Y2K problems and risks. He mentioned there also is information on the subject that could be considered misleading and, in some cases, inaccurate.

It was apparent that Don's experience as a mechanical nuclear engineer with 25 years at Bechtel Power and R. W. Beck has provided him with a the computer logic and process engineering background that have been fundamental to identifying and rectifying Y2K impacts on utility operations. He and his firm have specifically focused on impacts of Y2K on embedded microprocessors that control water, wastewater, gas, and electrical operations.

According to Don, responses toward Y2K concerns range from denial of any significant issues to commitments of substantial resources involving millions of dollars for risk reduction and contingency planning. Based on his experience, misunderstandings often exist related to the scope and magnitude of potential risks and measures needed to implement corrective actions at utility operations. A common, yet unrealistic, expectation is that a high-tech "silver bullet" solution will be unveiled in the eleventh hour as the new millennium approaches. Don explained, however, that a quick fix solution is not likely since major investments of time and resources are needed to address the problem. Typically, it takes 13 months to implement an effective Y2K program. From Don's per-

spective, many utilities have had Y2K programs underway for over a year while others are admittedly getting late starts and likely will not complete their programs by year end.

Key steps involved in an effective Y2K program include inventory and assessment, due diligence, remediation, and contingency planning. An essential part of the initial step is to identify and inventory embedded systems that have a time/date function that reside deep within the computer logic of critical control systems for plant operations. Due diligence involves the establishment of an audit trail that documents the approach taken to evaluate risks. A "paper trail" is developed to document what was done in reaction to what was found. Remediation involves measures taken to correct problems discovered and testing to confirm that measures were effective. Don mentioned that "drills" are less effective than more rigorous testing. Remediation efforts are need trained personnel, which has become a very limiting factor. Remediation of Y2K issues in the utilities industry could amount to over a billion dollars while future litigation costs are expected to exceed three billion dollars.

Y2K drills at utilities in the United States, England, and Australia indicate that Y2K risks to utility operations are real. Furthermore, potential problems are not a localized concern. Risk of a common mode failure is expected through all industries worldwide around, the end of the year. Availability and supply of resources and labor to address problems retroactively will be a critical factor. This is of particular significance since parts and materials these days are typically maintained in warehouses and other sites at a minimal or "just in time" level of supply.

Supply, storage, and delivery of raw materials and fuel, and reliance on communications and banking were discussed as being just a few of the external factors that can affect utilities operations. Physical constraints, for example, at some plants can prevent the ability to maintain on site a full range of critical raw materials and parts in sufficient quantity for extended periods. For this reason, internal Y2K compliance programs also must evaluate risks related to external or "interconnectedness" factors. Don indicated such external weak links could potentially disrupt operations even when internal risks have been tested and remediated. The interconnectedness issue should be considered a major area of concern in Y2K programs including contingency plans. Don suggested that contingency plans should be implemented or practiced in advance through a series of drills to evaluate the potential effectiveness of proposed measures.

Another area of potential concern involves third party audits since these have not been conducted extensively throughout the utilities industry. Instead, many utilities are approaching Y2K compliance programs only from within their organizations.

Such self-reporting can present risks to compliance. To assist small- to medium-size businesses with identifying Y2K risks, a program is available on CD format that he has assisted in developing.

Many of the older utility plants will have less Y2K problems since they are not as reliant on digital controls. Water and wastewater systems based on gravity, such as Seattle's water supply system, will be subject to less risk than those systems that involve extensive networks of pumping plants.

Y2K related failures are not anticipated to occur at the stroke of midnight on January 1, 2000, since most internal clocks in embedded systems are not synchronized. Where interruptions of service occur, they could extend over a period hours to days or perhaps weeks. It sounds like those utilities that will have effectively completed Y2K programs, including the analysis of interconnectedness issues and implementation of contingency plan drills, will be better prepared for the Year 2000.

Thatcher Dean of Seattle Public Utilities (SPU), discussed the City's Y2K efforts mentioning that a Y2K Project Management Office has been established. Dean focused his discussion on contingency planning efforts the City has undertaken in recent months. For example, he touched on the nature of actions that will be taken if there are interruptions in electricity or telecommunications.

Based on an evaluation in recent months, SPU was determined to be at a mid-risk level for Y2K-related problems. The City of Seattle, on the other hand, was determined to be at a high-risk level. To address this, Thatcher mentioned that considerable efforts have been underway for some time to improve readiness throughout the City's operations. With regard to water supply, Thatcher indicated the distribution system is relatively low-tech and gravity based with valves that can be operated

manually. Reservoirs within the City will be maintained at or near capacity toward the end of the year.

Dean stressed that Y2K is a business continuity issue. One important area of the City's planning has involved identifying critical services. Dean indicated the City is "emergency ready". Seattle's program has built upon the Washington State baseline Y2K Emergency Disaster Response Plan. Under the City's plan, it is assumed that a 72-hour period of response or up to 7 days with intermittent or no power will take place. This also assumes that availability and distribution of essential materials and supplies could be interrupted for periods lasting up to 14 days.

So who will be tending the ship at the City's operations if Y2K interruptions occur? To address this issue, City staff have been encouraged to have 3 days of food and other essential supplies on hand for their families so that staff can be available to assist with response planning for City services.

According to the current schedule, the City is expected to complete the Emergency Response Plan, including remediation and initial contingency planning, by next month (June). Drills are scheduled through September. A November final readiness check will be conducted to determine if any course corrections are needed at that time. Thatcher indicated the City is making every effort to be ready to address Y2K and other emergency response issues and is on schedule with related planning efforts. To quote Dean, "Seattle is planning for the worse and expecting the best." Those interested in learning more about the City's Y2K planning efforts should visit the Y2K web site at www.ci.seattle.wa.us/util/news/y2k/. ☺

Padilla Bay Brant Management to be Discussed

MOUNT VERNON--People with an interest in Padilla Bay brant management practices are invited to a May 18 public meeting here to raise their questions and concerns for consideration next month by a scientific panel. The public session will be held downtown from 7 to 10 p.m. in Room B of the Skagit County Courthouse, 700 S. Second St.

Questions raised in the public session will be forwarded to a panel of university scientists which will convene in June to review Washington Department of Fish and Wildlife's (WDFW) brant management practices.

WDFW invited the Washington Cooperative Fish and Wildlife Research Unit, located at the University of Washington, to conduct the independent scientific review. The review panel is expected to include waterfowl scientists and representatives of hunting and environmental organizations.

The scientific panel meeting will be followed by another public meeting in July to discuss the panel's

recommendations, the state brant management plan and the proposed 1999-2000 waterfowl hunting seasons.

Recent WDFW brant management actions, including the decision to maintain game reserves at Padilla Bay, have been questioned by some members of the public who want more opportunity to hunt the small, black waterfowl, also known as sea goose.

Brant population declines prompted WDFW to restrict hunting seasons in recent years. Brant, which pass through and winter in this state, breed from the Canadian Arctic to western Alaska, according to WDFW Waterfowl Section Manager Don Kraege.

Last year, brant hunting was limited to five days. Brant populations appear to have recovered sufficiently to allow a longer season this year, Kraege said.

1999 Membership Application / Change of Address Form

(⌂ please circle, as appropriate ↗)

Annual membership in the state chapter costs \$25.

(If you attended the 1998 Fall Conference, you are already a member for 1999 – Welcome!)

Name _____ Position _____ Affiliation _____

Street Address _____ City _____ State _____ Zip _____

Phone(_____) _____ Fax(_____) _____ E-mail _____ @ _____

Check if you would like to be actively involved on a committee during 1999.
You will be contacted to determine what committee involvement you would like.

1999 Membership Dues (through October 1999): \$25.00. **Checks only.** Please make check payable to **AWRA Washington Section.**

Mail to: AWRA, Washington Section
c/o Mike Wert, Shapiro & Associates
101 Yesler Way, Ste. 400
Seattle, WA 98104

The American Water Resources Association is a scientific and educational non-profit organization established to encourage and foster interdisciplinary communication among persons of diverse backgrounds working on any aspect of water resources disciplines. Individuals interested in water resources are encouraged to participate in the activities of the Washington Section.

Special thanks to Golder Associates Inc. for word processing and graphics support on this newsletter.

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