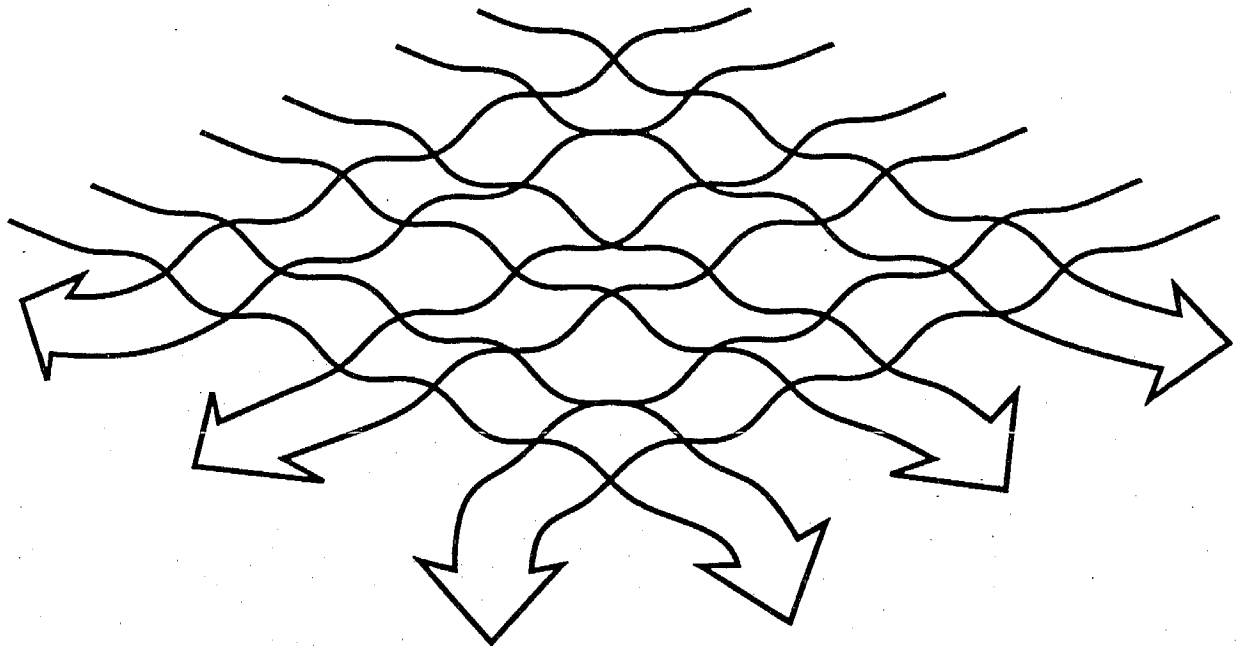


Nonpoint Source Management



1994-95 BIENNIAL REPORT

**State Water Resources Control Board
Regional Water Quality Control Boards**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY


REGION 9

75 Hawthorne Street
San Francisco, CA 94105-3901

January 10, 1997

MEMORANDUM

SUBJECT: California's Nonpoint Source Program

FROM: Sam Ziegler 
NPS Coordinator

TO: All Interested Parties

I am pleased to make available to you the Nonpoint Source (NPS) Program Biennial Report: Calender Years 1994 and 1995 as prepared by the California State Water Resources Control Board (SWRCB). The California NPS program has made significant progress during this period and this report accurately reflects much of that advancement, particularly in pursuing local watershed and stewardship efforts. These NPS Program activities are successfully engaging a wide spectrum of California communities in protecting and enhancing our valuable water resources.

A key to the success of the NPS Program is to provide good useful public information. This report is a step in that direction. By sharing these success stories people can learn from each other and we can receive feedback that will help improve future program activities. In addition, the many good efforts of the State Board, Regional Water Quality Control Boards and numerous private and public partners (e.g., the Resource Conservation Districts) can receive the recognition they deserve for leading the way to improving California's aquatic ecosystems .

As the SWRCB, RWQCBs, and U.S. EPA Region 9 continue to join with others to encourage watershed management as a means to improve water quality, we look forward to the NPS program continuing to provide leadership, particularly in terms of supporting local watershed efforts that are coordinated with partnerships among agencies and private interests. In this way we can help support a feature of watershed management (e.g., local stewardship) that may provide for sustained, long term improvements in the beneficial uses of water, while helping to broadly enhance community values.

Please feel free to contact me at 415/744-1990 or through email ziegler.sam@epamail.epa.gov, if you have any questions, suggestions, and/or comments concerning the contents of this report or other activities related to addressing nonpoint source pollution in California.

NONPOINT SOURCE MANAGEMENT 1994-95 BIENNIAL REPORT

This report partially fulfills Tasks 0.5(e) and 0.5(h) of the Nonpoint Source Program workplans of the State Water Resources Control Board and the nine Regional Water Quality Control Boards covering July 1994 through March 1996.

Project Director/Writer: Katherine Domeny
Graphic Design/Layout: Dale Oliver

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Special thanks to staff at the State and Regional Boards for sharing their knowledge, experience and insight regarding the nonpoint source program. At the State Board: John Norton, Stefan Lorenzato, Mike Reid, Sid Taylor, Galen Lee, Gwen Starrett, Rick Humphreys and Pam Parker were unfailingly helpful. At the Regional Boards, particular thanks to William Winchester and Bruce Gwynne, Region 1; Leslie Ferguson and Dale Hopkins, Region 2; Howard Kolb and Karen Worcester, Region 3, Heather Trim, Region 4, Dennis Heimann, Jerry Bruns, and Rudy Schnagl, Region 5; Fred Blatt, Region 6; Ken Coulter, Region 7; Wanda Smith, Region 8 and Greig Peters, Region 9.

PREFACE

The narrative that follows does not just relate to the activities and efforts of the State Water Resources Control Board (State Board) and Regional Water Quality Control Boards (Regional Boards) over the past two years. It speaks also to the critical expanding circle of public and private actions that have been and need to be taken if waterways are to be safe from nonpoint source pollution; our wetlands and riparian areas protected and returned to their natural functions of controlling runoff and floods; and our land resources and ground water basins safeguarded.

Much is written reminding us that "everything is connected to everything else". Nowhere is this more apparent than with our land and water resources and nonpoint source pollution. The dynamics of these relationships drive the necessity to approach nonpoint source control from a watershed perspective.

The following pages also speak to the importance of education at all levels of public and private life, focusing on what each of us personally and professionally can do to bring nonpoint source pollution under control. They emphasize the necessity of citizen and landowner involvement in watershed decision making, volunteer monitoring, stream restoration, and in changing land use management practices.

You will find extensive information about the diverse and proactive partnerships developed by the State and Regional Boards to expand their efforts to control nonpoint source pollution and you will learn how these partnerships work. Hopefully, you will leave these pages with a better understanding of how the State and Regional Boards exercise their leadership in nonpoint source control through educational outreach, networking, financial and technical assistance, and regulatory encouragement.

And whoever you are—whatever role you play in the watershed in which you live, work, or recreate—hopefully you also will leave these pages with a better understanding of how everyone who lives in California can participate in control of nonpoint source pollution through watershed management and in the process create a more productive and sustainable future.

Nonpoint Source Management

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IN THE BEGINNING.....

They have sat across the table from each other, traded pleasantries, negotiated, cajoled, and dealt with anger. They have walked fields and streams together, learned to recognize water quality problems, and discussed each other's needs and constraints. Along the way, they developed enough trust and understanding to explore solutions together and begin developing a plan of action all could live with.



Who are they?

They are ranchers, timber operators, and environmentalists; farmers, hydrologists, land developers, and biologists. They are ecosystem specialists and businessmen; educators and children; and representatives from local, State and Federal agencies. They are fishermen and dairymen, community activists, and resource managers.

These are the people who have formed working partnerships to solve and prevent California's most serious water quality problem--nonpoint source pollution. Their organizations have many acronyms: RCDs, WAGs, TACs, IACs, CRMPs, WEOPs, and CACs.¹

Working with them are water quality experts from the State and Regional Boards: identifying problems and pointing out the relationships between land management practices and nonpoint source pollution, educating others as to the

"For many years, government's job was to regulate and monitor water resources, but government cannot function alone. Watershed management works best when local citizens band together to protect their resources. Watershed management brings home environmental regulations crafted in federal and state government centers for the guardianship of the local citizenry."

Mary Jane Forster, Member, State Water Resources Control Board

RCD (Resource Conservation District), WAG (Watershed Advisory Group), TAC (Technical Advisory Committee), IAC (Interagency Advisory Committee), CRMP (Coordinated Resource Management Planning), WEOP (Watershed Education and Outreach Program), and CAC (Citizens' Advisory Committee).

importance of protecting areas like wetlands and riparian corridors, and gathering information on the public and private success stories that are resulting from nonpoint source control efforts.

The most successful partnerships have focused their efforts on a watershed basis. Out of months of working together they have identified common interests and forged goals to satisfy those interests. And in the process of working toward a healthier watershed, they have targeted the pollutants that interfere with achieving those interests: sediments, pesticides, nutrients, high water temperatures, degraded wetlands, and eroded, devegetated streambanks.

As they have learned each other's language and traded essential information, they also have learned a critical breakthrough lesson. According to one participant, "While science can be deadly boring around the conference table, it can be fascinating in the field".

Building Successful Partnerships

Educating each other is the first task of any partnership. Most watersheds are areas of mixed uses and competing activities. Individual perceptions regarding the best use of the watershed may never be exactly the same, but those who share a watershed's resources usually recognize the benefits to all users in sharing a healthy watershed.

"One of the most important missing elements in our society is that we are taught how to compete, but we are not taught how to build community."

Gaylon Lee, State Water Resources Control Board representative to the State Board of Forestry Monitoring Study Group.

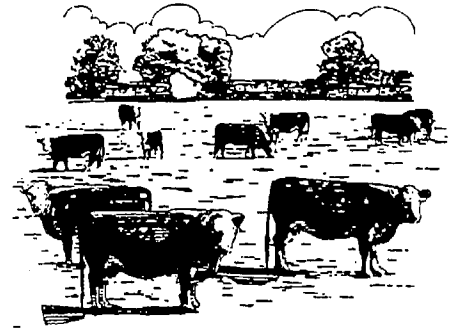
The willingness of each participant to listen, to attempt to understand and acknowledge points of view and experiences different from their own is the energy that drives the success of a partnership. For many, this can be a trying process. Sometimes it is one about which participants are willing to talk, only after success has been achieved: after the agreements have been reached, and the changes made that will bring nonpoint source pollution under control.

The examples that follow are a sampling of the successful groups who have faced and solved these problems. They exemplify the perseverance and commitment needed to make the process work. All used Clean Water Act (CWA) Section 319(h) funds as a component of project funding and benefited from the dedicated guidance and involvement of Regional Board staff.

Eagle Lake - Lassen County

Eagle Lake, California's second largest natural water body, sits in a closed basin in the high desert country of northeastern California. As a closed basin, everything that drains into the Lake stays there.

The developmental history of the area is the classic story of the "old west" and public land grazing. The environmental history of the Lake and its main tributary, Pine Creek, is also a classic story--a story of the inevitable consequences: trampling and loss of riparian vegetation, stream and lakeside erosion and sedimentation, eutrophication from nutrient contamination, and imminent loss of the trophy Eagle Lake rainbow trout. Over the years, the battle lines were drawn as lakeside homeowners, fishermen, environmentalists, and recreationists reacted to the losses.



Tensions mounted until 1985 when a wise, courageous University of California (UC) Cooperative Extension resource officer decided that the only way to forge solutions was to bring all the adversarial parties together in face-to-face communication through the newly developed CRMP (Coordinated Resource Management Planning) process. Many were reluctant to be involved but "to protect their interests", participated. In the beginning, staying with the process was often difficult and uncomfortable, but the new experience in partnership limped along.

Major breakthroughs began to develop when participants substituted walking the resource area together instead of talking across the table. As one of them put it, "Around the table in a room, you are in a face-off position. In the field you have to walk shoulder-to-shoulder and talk about what's on the ground in front of you--the problems and the issues".

In thrashing out the issues they soon recognized that lack of upland water development was a key factor in the way cattle developed eroding trails and concentrated themselves in and along the shoreline areas of the Lake. For the environment this meant serious water quality problems from nutrients and sediments and loss of riparian vegetation, wildlife habitat, and recreational amenities.

Among the solutions devised: upland water sources are being developed or improved; grazing allotments have been redesigned; rotational grazing was instituted; and exclusionary fencing is being installed. Gradual water quality improvements, restored riparian vegetation, and improved forage will document the success of removing cattle from the Lake.

Huichica Creek--Napa County

"The past twenty-five years have taught us a simple, but important lesson: preventing pollution is far more efficient, both economically and ecologically, than cleaning it up."

*Carol Browner, Administrator,
U.S. Environmental Protection
Agency*



Much of the Huichica Creek Watershed, formerly dairy and cattle country, is now classic Napa Valley wine country. It also is tributary to the Napa Marsh State Wildlife Area and San Pablo Bay and habitat for an endangered freshwater shrimp. Sedimentation problems from former grazing and dairy practices along with the grape growers' practice of vertically tilling the hillsides had seriously destabilized the creek.

Runaway downcutting of the stream channel, collapsing streambanks, and increased braiding of sections of the stream had resulted from the heavy sediment load the creek carried. These problems threatened not only the creek but the shrimp and the growers. The watershed needed to be brought back into equilibrium.

Strong RCD leadership, dedicated grower interest and participation, and State and Federal agency technical and financial assistance were used to create a winning situation. Restoration planning has been completed and implementation is in process. With CWA Section 319(h) Funds, the creek is being stabilized with bioengineering techniques and revegetated with native plants. Where necessary, the stream gradient is being reduced with instream checks, banks are being stabilized, and new, lower elevation flood terraces are being created to carry the high flows that cause erosion.

But repairing the stream was not enough. Getting control of the upland watershed sediment load was critical to protecting the work being done in the creek. Mutually acceptable solutions to upland sediment control with changes in land management practices were negotiated and are being implemented.

Working together, agencies, landowners, and managers developed a "Natural Resource Protection and Enhancement Plan". The emphasis of the Plan is to allow economic use of the land in a way that protects and enhances the natural resources of the watershed. By combining the experience and ingenuity of landowners and managers with the technical abilities and assets of the government agencies, solutions to the sediment problem were developed.

The results? Sedimentation has decreased and shrimp habitat has increased! A surprising spin-off has been the increased value of the grape crop. When grapevines grow too vigorously, adding too much leaf cover, they lose their flavor. By planting grass between the rows to control erosion, leaf cover was reduced and kept in balance with the fruit. A grassy-tasting sauvignon blanc became a sauvignon blanc with overtones of melon and papaya.

Wolf Creek - Plumas County

Stream restoration is both art and science. No one knows this better than the folks living in the watersheds tributary to the East Branch of the North Fork of the Feather River (EBNFFR) in Plumas County where they took on the job of reversing land and stream degradation from 140 years of intensive human resource extraction and use. This watershed had seen it all: mining (placer, hydraulic, and hard rock), grazing, timber harvesting, wildfires, and railroad and road construction.

At least 60 percent of the EBNFFR Watershed is suffering from erosion. Many meadows and upland areas have lost the equivalent of 6 to 12 inches of top soil. Accelerated erosion has downcut streams causing meadows to drain. With the lowered groundwater table, sagebrush has invaded areas once dominated by forage grasses.

These vegetative changes and erosion related nonpoint source pollution have significantly reduced fish and wildlife populations, threatening one of Plumas County's principal economic bases: tourism and recreation. Floods are a constant threat to streamside property owners. Even the distant customers of Pacific Gas and Electric Company (PG&E) power have been affected. It is estimated that 1.1 million tons of sediment per year enter PG&E's Rock Creek Reservoir, and the reservoir's storage has been reduced by accumulated sediment to 46 percent of its original capacity.

A Coordinated Resource Management Planning Group was formed to guide restoration decisions and activities. Now the group can look back with satisfaction on its successes. But it did not always come easy. In the beginning, participants had been polarized into adversarial positions for so long that they had to "meet in secret" so as not to lose standing among their peers. Meeting at the local public library, they called themselves the "Quincy Library Group".

Out of the vision and perseverance of these courageous leaders came a Coordinated Resource Management program that is changing the future of this once blighted area. Participants were well aware of the "boom and bust" history of their area and operated on the principle that a sustainable environment meant a sustainable economy. This concept has driven the program. In developing and implementing projects, the CRMP group works closely with the Plumas Corporation, a community development corporation.

"A watershed is more than the physical landscape that is defined by its ridges with one outlet for water to flow. A watershed supports a variety of resources, uses, activities and values where everything there is linked in such a way that eventually all things are affected by everything else in the watershed. Perhaps, more importantly, a watershed contains the history of all that went before and the spirit of those who touched it remains."

*George Wingate, U.S. Bureau of
Land Management*

At Walker Mine, an abandoned copper mine, 100 acres of eroding mine tailings, 20 feet deep are being stabilized through restoration work that includes geomorphic channel reconstruction. The area has been revegetated, wind fences have been installed, and five acres of wetlands have been developed to demonstrate passive, biological treatment of mine leachate.

Cottonwood Creek at Big Flat Meadow was moved from its old channel, which had downcut 15 feet and was dewatering a 47-acre meadow, to a new reconstructed channel on top of the meadow to raise the water table and restore forage. The abandoned gully was filled in or converted to a series of ponds to create wildlife habitat. The work has been accompanied by sustainable grazing management changes.

Wolf Creek was perhaps the most technically challenging of all. Where it flows through the town of Greenville, winter and spring torrents of previous years already had taken fences and back yards. Now, homes, a commercial establishment, and a municipal waterline were threatened. Previous attempts to control the stream by straightening it and building walls along the creek banks had failed. Something more than the traditional flood control "fixes" was needed. The decision was made to restore the stream using the innovative geomorphic analysis and reconstruction approaches developed by hydrologist, Dave Rosgen, of Colorado. They had been used in other arid landscapes. This was to be the first project in California.

With heavy equipment the channel was realigned with new meanders; banks were stabilized with logs, rootwads, boulders, and native vegetation; and the floodplain was reconstructed and revegetated. Instream, rock vortex weir step pools were installed to slow and direct the stream's energy. Everything seemed to be working. The Creek was performing like a naturally stabilized stream.

Then came the flows of March 1995--record rainfall on top of already saturated ground and snow. The community held its breath. Upstream, above the stabilized channel, over 100,000 tons of sediment--perhaps as much as 150,000 tons--waited for a storm event like this to move downstream; and down it came. In a stream where bank full capacity of the restored channel is 400 cubic feet per second (cfs), the flood flows are believed to have peaked at over 4,470 cfs.

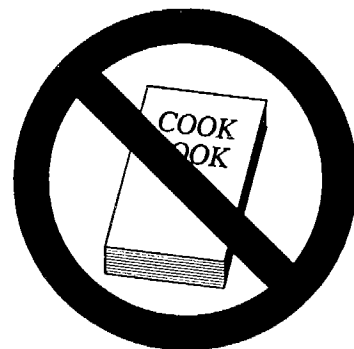
What did the flood do? Surprisingly, much of the work remained intact. But the low gradient, most confined section of the stream, which lacked a fully functioning floodplain,



unraveled. Where broad meanders had been constructed during the restoration work, the stream cut a new, straight channel for itself.

At first there was disappointment. But out of that experience important lessons were learned--the most imperative being the necessity to take care of upstream restoration problems before beginning downstream work; problems upstream inevitably move downstream and will undo previous restoration work. Fortunately, most of the restored banks showed little erosion and there was little loss of private property.

The lessons learned from this extreme event will guide the design and implementation of future projects, always keeping in mind stream restoration is not a "cookbook" exercise. As a local hydrologist stated, "On the face of it,...the basic principles are obvious once learned, but the insight as to how they work and interrelate in a specific system can be perplexing".²



Across the State

Throughout the State, stream restoration projects designed to stop the deadly flow of sediment into our streams and creeks, rivers and lakes, and bays and estuaries are being planned and designed and implemented and evaluated with CWA Section 319(h) funding. In fact, CWA Section 319(h) grants have been the primary tools available to the State and Regional Boards in achieving implementation of projects designed to control nonpoint source pollution.

In selecting these projects, the State Boards' original strategy was to fund demonstration projects with potential for providing watershed communities and industries with examples of activities and management measures that would lead to successful nonpoint source pollution control. Projects ranged from stream stabilization and restoration to pesticide use reduction strategies and from irrigation management to nutrient management, range management, and erosion control.

As the program has matured more emphasis has developed on outreach incorporating the concept of watershed stewardship into the nonpoint source control program. Projects are evaluated within the broader context of water quality as a reflection of watershed management, stewardship awareness, and community involvement.

² Terry Benoit, Hydrologist, Plumas National Forest

THE CALIFORNIA WATERSHED PROJECTS INVENTORY

Need to know which CWA Section 319(h) projects are fisheries based or what the resource issues are in one of the many watershed projects throughout California?

Through the California Watershed Projects Inventory, the State Board is providing to all who are interested in watershed planning an in-depth look at statewide conservation and restoration planning and management efforts.

Using ArcInfo GIS and the World Wide Web, the inventory allows anyone to tap into a wealth of information about watershed based projects, including CWA Section 319(h) projects funded through the State and Regional Boards.

Initially a database of information on Coordinated Resource Management Projects and CWA Section 319(h) projects, the inventory has been combined with other data sets to provide a look at State, Federal, and locally sponsored conservation and restoration projects statewide. Project information can be accessed by name, location, project cooperators, resource issues, and water quality data. Much of the information is displayed on regionally digitized maps.

The Watershed Project Inventory was developed out of a collaborative effort between the SWRCB, the California Department of Fish and Game, and the University of California, Davis. Other cooperators include: the U.S. Bureau of Land Management, U.S. Environmental Protection Agency, Natural Resource Conservation Service, U.S. Department of Agriculture Forest Service, U.S. Fish and Wildlife Service, Resource Conservation Districts, and individual watershed groups.

The inventory is still a work in progress and is expanding both its geographic coverage and its content.

The California Watershed Projects Inventory Net address is <http://ice.ucdavis.edu/CaliforniaWatershedProjectsInventory>



OUTREACH AND NONPOINT SOURCE CONTROL

State and Regional Board outreach is both the backbone of the nonpoint source pollution control program and the "grease" that lubricates the process.

The stunning success of the statewide outreach effort of 1994/95 --the marshaling of teams of government, industry, academic, and public representatives into ten Nonpoint Source TACs speaks to the effectiveness of this approach.

Concentrating on the primary sources of nonpoint source pollution in California, these teams evaluated existing Best Management Practices (BMPs) and developed recommendations for modifications and approaches they believed would most effectively solve the State's nonpoint source problems. Led by State Board staff in cooperation with the California Coastal Commission, over 150 people worked thousands of hours over an eight-month period to produce their evaluations and recommendations in ten Technical Advisory Reports.³

The TACS presented their reports to the State Board at a Workshop in January 1995. Since then, approximately 7,000 copies of the reports have been distributed to the public in response to individual requests.

The TAC reports also were used to develop the State's submittal to fulfill the requirements of Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990.

A central theme coming out of the TAC reports was the need to focus nonpoint source management on a watershed basis. This includes working in concert with local landowners and managers; community and environmental representatives; and other local, State, and Federal agencies able to provide technical, financial, and regulatory assistance. The State and Regional Boards have adopted the watershed.

"No important change in human conduct is ever accomplished without an internal change in our intellectual emphases, our loyalties, our affections, and our convictions....We abuse the land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."

*Aldo Leopold, Conservationist,
Author, Sand County Almanac*

³ The TAC reports cover: Grazing (On private rangelands), Nutrient Management, Irrigated Agriculture, Pesticide Management, Confined Animal Facilities, On-Site Disposal Systems, Urban Development, Recreational Boating and Marinas, Abandoned Mines and Hydromodification. These reports are available from SWRCB, Nonpoint Source Unit, 901 P Street, Sacramento, CA 95814.

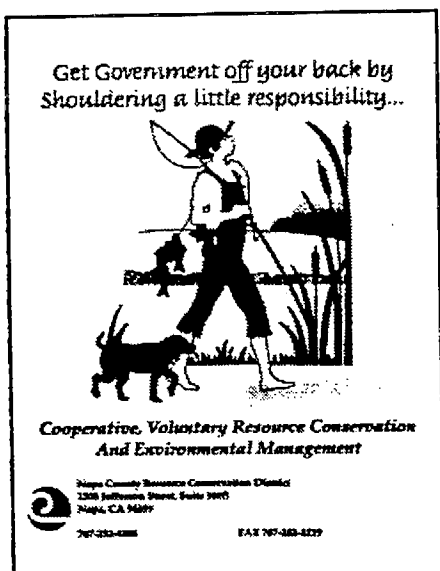
In September of 1995 the State Board approved an "Initiatives in Nonpoint Source Management" ⁴ (Initiatives), building on the TACs' recommendations.

Echoing the TACs' recommendations, the Initiatives document also emphasizes the value and necessity of education and training as the means to develop long-term implementation strategies and commitment to the goal of controlling nonpoint source pollution. The potentially effective role of citizen monitoring is also recognized and encouraged.

The TAC reports and Initiatives' strategy guided development of Regional Board workplans for 1996-97 with Regional Boards focusing their efforts on targeted watersheds and toward targeted water quality concerns.

Local initiative was identified in these documents as central to successful nonpoint source pollution control, validating the approach the State and Regional Boards had initiated and encouraged through their many contacts with State and local organizations.

Ongoing Outreach Efforts



One of the State's RCDs operates under a motto that says, "Get government off your back by shouldering a little responsibility". ⁵ As more and more individuals have taken this concept to heart—both as individuals and through their organizations—State and Regional Board staff have been able to broaden their efforts, concentrating on providing the technical support and moral encouragement needed to initiate local projects. Within the limited funding available through CWA Sections 205(j) planning and 319(h) implementation grants, the Regional Boards also have provided financial support.

Hours are spent attending the meetings of local organizations, giving educational presentations, participating in field trips, and giving one-on-one advice. Over the past two years as funds specifically budgeted for outreach have increased, so have the results. As one Regional Board staff member commented, "Previously we were able to attend meetings with a group on a once-a-year basis. Now we meet with them at least monthly and we are seeing the payoff in results".

⁴ "Initiatives in Nonpoint Source Management" is available from SWRCB, Nonpoint Source Unit, 901 P Street, Sacramento, CA 95814.

⁵ Napa County Resource Conservation District

The importance of this continuity comes through in the statements of many of the participants--all related to the issue of "time"--and these statements explain why time is so important.

This is what is heard!

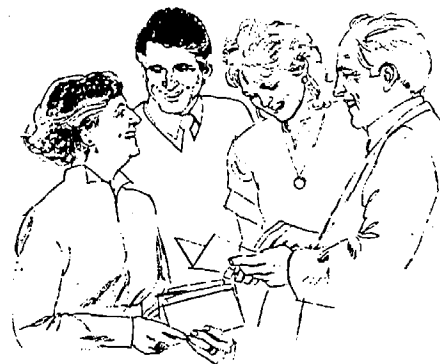
"Trust takes time". "Breaking down the barriers of old ways of doing things takes time". "Getting acceptance for new ideas takes time".

Just as the problems related to nonpoint source pollution took time to develop and recognize, so the solutions take time to develop and implement.

The grassroots outreach carried out by the Regional Boards is facilitated by outreach at the State Board level. Regional Board staff works with local or regional organizations. A State Board representative works with the umbrella organizations with which the local groups are aligned. Working at this policy setting level, it has been possible to further the integration of water quality concerns into the ongoing programs of these organizations.

Such organizations and committees include:

- The Water Quality Task Force of the California Association of Resource Conservation Districts (CARCD);
- The Certified Crop Advisory Board, which administers the statewide program of education and certification of fertilizer and pesticide advisors established by the American Society of Agronomists;
- The technical advisory committee to Coordinated Resource Management and Planning;
- The River Basin Coordinating Committee of the Natural Resource Conservation Service (NCRS), which now includes a water quality element in their resource plans; and
- The U.S. Farm Service Agency Advisory Group, which works with the U.S. Department of Agriculture on cost share issues and makes recommendations to federal officials in Washington on cost sharing for new management practices. As a result of the efforts of this group a water quality improvement program has been created.



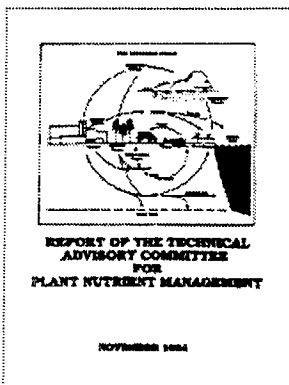
"There is no one out there who is purposely causing problems. If you can show them that there's a better way and do it through a 319(h) demonstration project so they actually can go see it and it shows what can be done, it gets people on board."

Dennis Salisbury, North Coast Regional Water Quality Control Board

Work with the Water Quality Task Force of the CARCD facilitated presentations by an RCD consultant to all the Regional Boards on the work of the RCDs, and the role they can play in helping the Regional Boards in their efforts to reduce nonpoint source pollution. Many CWA Section 319(h) projects have resulted from these collaborations.

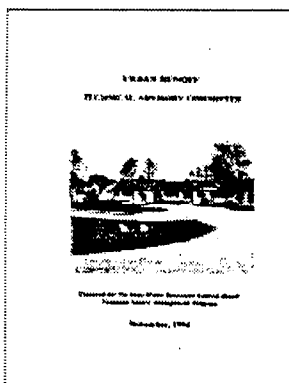
Partnerships with and among other State and Federal agencies and organizations with land management authority and expertise or involved in resource management issues have been critical to the nonpoint source control program. Partnerships with State and Federal resource agencies have developed understanding of the Boards' nonpoint source goals and alerted these agencies to potential nonpoint source problems in carrying out their land management responsibilities. Partnerships also have led to collaboration and integration of watershed resource management activities and programs so that available dollars and staff resources could be put to maximum use and targeted at the most serious problems. This cooperative activity has been primarily facilitated through the State Board formed IAC and use of the IAC in the CWA Section 319(h) grant selection process.

THE TECHNICAL ADVISORY COMMITTEES (TACs) *Grassroots in Action*

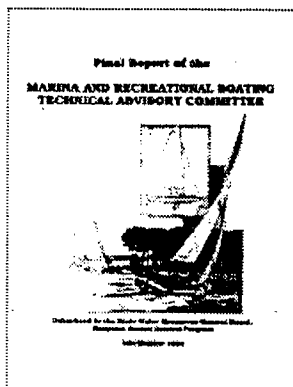


Following what has become known as the interest based problem solving approach, hundreds of people worked together for over eight months pooling their expertise, experience, and ideas to develop recommendations on actions needed to prevent and control nonpoint source pollution.

As representatives of agriculture and business, government and industry, environmental and community organizations, as well as academia, they worked with the State and Regional Boards to develop Technical Advisory Reports that both analyzed nonpoint source pollution control activities statewide and presented recommendations for future activities. Their findings and recommendations formed the basis of the Technical Advisory Reports they presented to the State Board in January 1995.



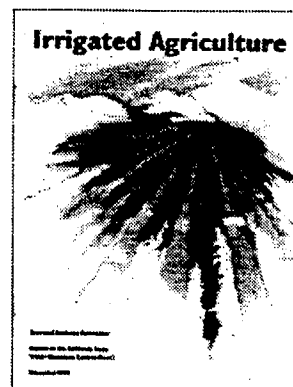
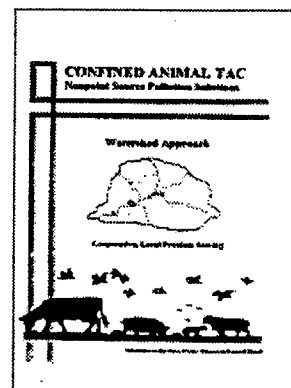
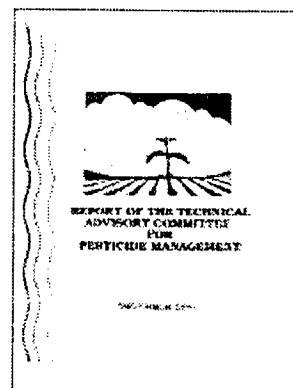
In these reports, committee members strongly supported the State Board's three-tiered approach which emphasizes voluntary cooperation (Tier I) as the preferred level of implementation. The reports, however, also recognized the necessity for Tier II (Regulatory based encouragement for best management practices) and Tier III (Enforcement mechanisms) backup implementation.

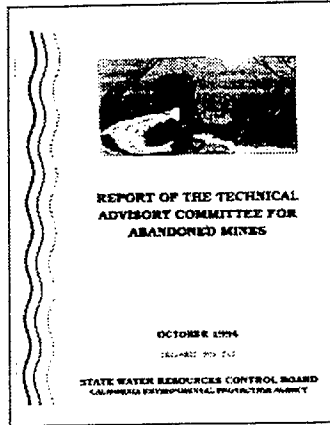


As one report stated, individual operators "...are best motivated by enlightened self-interest....", but equally essential is "the awareness of regulatory enforcement should the voluntary process fail".

Their analysis also emphasized increased education as to:

1. The dynamics and causes and effects of nonpoint source pollution;
2. The value of watershed partnerships to develop and implement solutions to NPS pollution control, emphasizing these should include local landowners, managers and advisors, environmental and community representatives, and Federal, State, and local government representatives. Regarding the latter, the TACs recommended increased coordination to achieve better pooling of technical, financial, and regulatory resources; and
3. Pursuing "...the primary objectives of long-term remedies and sustainable agriculture."

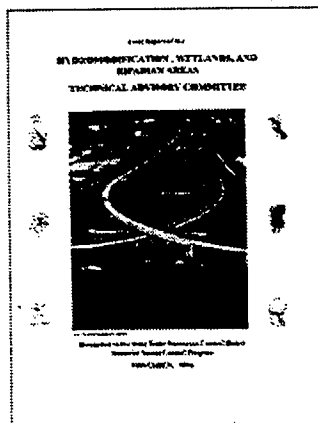
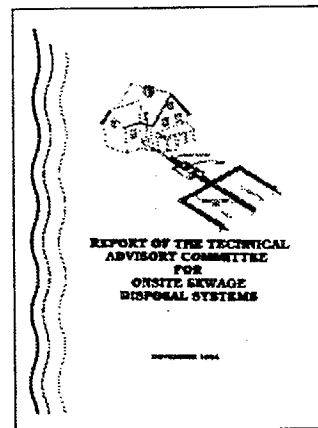




TAC REPORT SPINOFFS

The Mining Technical Advisory Report facilitated development of Assembly Bill (AB) 1108—State legislation providing limited liability protection for those who would clean up an abandoned mine.

The On-Site Sewer Systems TAC Report provided information that is facilitating the development of the California Onsite Wastewater Training and Research Center at California State University at Chico. The Center's goal is to implement TAC recommendations on education, training, and certification, as well as demonstration of emerging technologies and design of performance standards for on-site systems.



The Hydromodification TAC recommendations led to development of The Wetlands Discussion Group, an informal agency/private sector forum seeking ways to improve the efficiency of California wetland regulation. In addition, the California Association of Resource Conservation Districts is seeking funding to develop a Wetland Protection Practice Handbook to be used to identify, avoid, and minimize development impacts on wetland and riparian resources.

MORRO BAY *A Paradigm of Outreach and Cooperation*



The Morro Bay Watershed is only 76 square miles. But the impact of nonpoint source pollution on the Morro Bay

Estuary has been far out of proportion to the watershed's size. The most threatening pollutant has been sediment. In the early nineties, it was estimated that the Bay had lost 25 percent of its capacity over the previous 100 years. As human uses have intensified, so also has the amount of sediment entering the Bay. And "piggy-backing" on these sediments are metals, nutrients, and organic chemicals.

In the mid-eighties a massive agency/citizen effort to reverse the devastating effect of nonpoint source pollution on the Estuary began. The Regional Board has always been a key player--from originally identifying the Estuary as an "impaired water body" and a high priority water resource needing improvement to the 1994 designation of Morro Bay as part of the National Estuary Program and current work on a management plan. Their involvement provides a powerful example of how the Regional Boards, citizens, and other agencies can work together.

From the beginning, the Regional Board worked closely with other members of the Morro Bay Task Force, a county sponsored group of approximately 60 State, Federal, and local agencies and organizations dedicated to focusing attention on Morro Bay and its problems and seeking solutions. In 1992, Regional Board staff took over administrative duties which previously had been provided by San Luis Obispo County.

In the meantime, the Regional and State Boards had approved a CWA Section 319(h) grant for the Coastal San Luis RCD to identify and implement Best Management Practices on local farm and grazing lands. This project was completed in 1995 and, according to Natural Resource Conservation Service estimates, resulted in saving approximately 119,760 tons of soil from eroding and eventually being transported to Morro Bay.

Regional Board staff also developed the workplan which resulted in the inclusion of Morro Bay in U.S. EPA's ten-year National Monitoring Program. Monitoring on paired subwatersheds is being conducted by both Regional Board staff and California Polytechnic State University using CWA Section 319(h) funds. Regional Board staff also supported Friends of the Estuary when they developed legislation to select Morro Bay as the first State estuary and a Regional Board staff member co-wrote the proposal which resulted in inclusion of Morro Bay in the National Estuary Program.

The Regional Board continues to provide technical and managerial assistance to the National Estuary Program with a Regional Board staff member appointed scientific director and co-director of the program.

PARTNERSHIPS IN EDUCATION

Thousands and thousands of minds have been stretched over the past two years as issues of nonpoint source pollution and watershed education have permeated California's culture from the board room to the classroom.

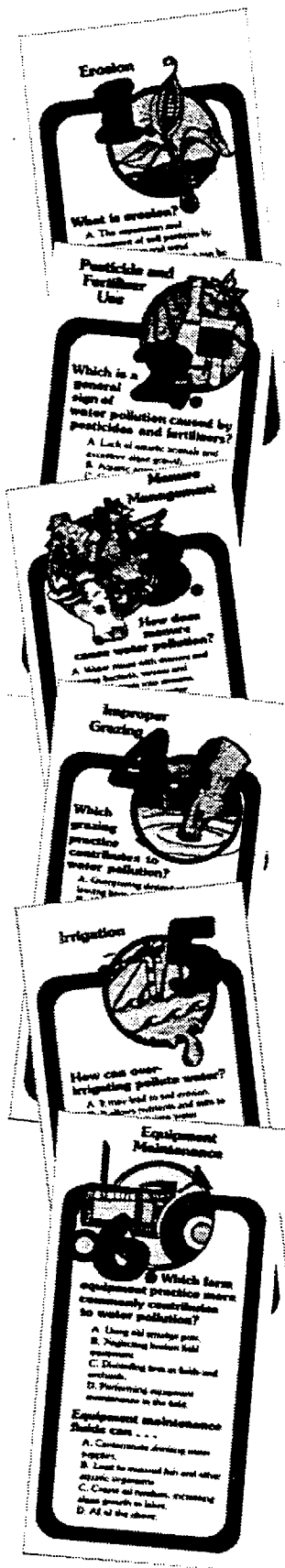
The examples that follow are not exhaustive but are presented to give a sampling of the many different kinds of educational activities that are taking place throughout the State. Some of the activities cited resulted from direct State or Regional Board participation. Others involved indirect support. They run the gamut from the most sophisticated presentations to knowledgeable professionals and land use managers to the most elementary for those of all ages--from school children to adults--who never before have heard of nonpoint source pollution.

In Contra Costa County, a consortium of business and government leaders are providing the tools and the guidance to help restore a wetland and develop wetland restoration curricula. In the process, sixth, seventh, and eighth graders and their teachers also are learning highly sophisticated technology skills. With corporate sponsorship, the students access the Internet, use E-mail, access and download satellite generated information, map information on Geographic Information System (GIS) layers, and ground truth information with Global Positioning System (GPS) documentation, and their own on-site surveys of plants and animals and water quality monitoring. They also are learning how to present their findings to their sponsors and the public. They will use the information they have collected to select one of five surveyed sites for a future wetland education center.

At the North Coast Regional Board, a different order of learning was called for as staff sought Board Member support to pursue solutions for a complicated interstate water quality problem. There, staff periodically and systematically made presentations to educate Board Members on the complex situation in the Lost River watershed in northeastern California. This degraded and flow-altered tributary to the Klamath River winds through both Oregon and California. Without strong Board Member understanding and support, staff would have been hampered in seeking the bi-state involvements necessary to solve this heretofore intractable water quality problem.

*"A mind that is stretched to
a new idea never returns to
the same dimension."*

Oliver Wendell Holmes



At another level, a CWA Section 319(h) funded project at Piner High School in Santa Rosa involved students working with teachers, professional engineers, and city officials to develop and test the design of alternative runoff facilities for their high school parking lot. The students also developed and implemented a communitywide multimedia campaign to educate the Santa Rosa community on the causes and effects of NPS pollution. From a survey they took in connection with the media campaign, they learned that successful nonpoint source pollution education is not a "one shot" deal but must be a continuing effort—a lesson we should all remember.

In Riverside and San Bernadino Counties where ground water pollution from dairy related salts and nutrients threaten the principal water supply, the Inland Empire West RCD produced brochures, posters, and other printed material to help convey better understanding of the causes and solutions to nonpoint source pollution to local dairy farmers.

At an educational conference, they honored dairies and owners who used good management practices with agricultural stewardship awards, showing that in addition to better water quality and an increased profit margin, land management stewardship pays off in the form of community appreciation and recognition. Materials developed through this CWA Section 319(h) program were distributed through RCDs to dairy farmers throughout the State.

Other districts, building on their CWA Section 319(h) grant demonstration projects, included educational outreach in the forms of field trips, newsletters, and conference/work groups to explain new techniques and management practices and to provide technical and economic information on implementation and the success of management changes. Among the projects showcased over the last two years were:

- An irrigation management demonstration project on row crops in the Mugu Lagoon watershed in Ventura County where a number of benefits were realized including: (1) increased crop yields, (2) reduced nitrates in the runoff, (3) reduced water use, (4) lowered pesticide and labor costs, and (5) earlier and more uniform harvest times. Irrigation management demonstration strategies now are being expanded to include orchard crops.

- A Sonoma/Marin County dairy manure management project in three watersheds demonstrating the use of various BMPs to control animal waste. One of the most successful has been fertigation (injection of liquid manure into the irrigation system) and controlled application which has solved the runoff—and thereby the water quality problem. In the process, pasture production and the number of annual grazing cycles were increased. An intensive educational outreach program is accompanied by technical and financial assistance.
- The Morro Bay Watershed where the Central San Luis RCD began efforts to protect the Bay from sedimentation with a series of educational workshops on the issues of ranch resource management, watershed management, and erosion control. With the cooperation of NRCS, conservation plans were then developed and implemented for interested landowners at 29 sites. As a result of the BMPs implemented, NCRS estimated that 119,759 tons of soil were saved from erosion and prevented from eventually adding to the sedimentation problem in the Bay.
- A spin-off of the restoration work in Plumas County has been development of a Water Resources Technician Program at Feather River College in Quincy. Focusing on field hydrology, instrumentation and data collection, the program is providing the academic and field training necessary to manage water resources, environmental restoration, and remediation and monitoring.

Meanwhile, throughout the State, primary and secondary school teachers have thronged to classes designed to expand their knowledge and understanding of healthy watersheds and healthy stream systems and the tools and techniques that best help them convey these concepts to their students. State and Regional Board staff provide background material, professional consultation, and presentation support for these many activities.

One of the most successful programs statewide is Adopt-A-Watershed (AAW), which uses the students' home watershed as a living laboratory to learn how their watershed and the streams, rivers, and lakes that drain their watershed interrelate with their communities and the health of both the watershed and the community. AAW is now working with California school children from kindergarten through high school in more than 200 schools throughout the State and continues to expand both its outreach and its curriculum.

"Watersheds don't need to be managed. It's what we do in the watershed that must be managed. People need to have an understanding of the results of their actions."

*Dennis Bowker, Napa County
Resource Conservation District*

"The general public is strikingly unaware of this crisis facing our natural resources, and therefore unaware of the responsibility each of us shares in its creation."

*Claudia Cohen, Executive
Director, Lindsay Museum*

At educational and community gatherings of all kinds: schools and county fairs, Earth Day celebrations, street fairs, and Scientists' Day, people of all ages have been fascinated and intrigued by the imaginative, innovative displays and interactive games created to teach about the relationships between everyday activities, water quality, and quality of life. These locally based efforts speak to the success of the dedicated outreach of State and Regional Board staff, their work with local organizations and the success they have had in conveying the message that successful long-term watershed protection and nonpoint source pollution control must be community driven.

Professional Education in a Changing World

Development of the California Grazing Plan

One of the most comprehensive and dedicated educational projects in the State has and continues to take place within the California grazing community which runs stock on over 40,000,000 acres of public and private lands. The first step in this continuing educational outreach was to train UC Cooperative Extension staff and staff of the U.S. Soil Conservation Service. Training focused on the impact of rangeland practices on water quality; State and Federal water quality requirements; planning and implementing rangeland management to improve water quality and protect riparian areas; and monitoring strategies.

The second step was to have the newly trained trainers develop and present workshops to educate owners and managers of private rangelands and any other interested public members. This effort was funded with a CWA Section 319(h) grant and was completed in 1994.

Concomitant with this outreach, the Range Management Advisory Committee to the State Board of Forestry also was awarded a CWA Section 319(h) grant to help develop The California Rangeland Water Quality Management Plan, a program for compliance with the CWA, the Coastal Zone Management Act, and the Porter-Cologne Water Quality Control Act. This industry supported plan was approved by the State Board in July 1995.

Now, outreach programs conducted by industry, UC Cooperative Extension, NRCS, and RCDs will aid rangeland owners and managers with further on-site water quality training and technical assistance. Success of this outreach

and implementation program will be gaged upon owner/manager completion of nonpoint source self-assessments; completion of ranch water quality plans and letters of intent regarding water quality control actions; implementation of the proposed practices and documentation of water quality improvements.

UC Cooperative Extension Farm Advisors and NRCS Conservationists already are involved in more than 20 watershed/water quality projects in an equal number of counties conducting nonpoint source related Range Management Short Courses. Surveys show that 70 percent of the previous participants in these short courses made changes in their grazing management practices.

Stream Restoration

CWA Section 319(h) grant funded projects specifically devoted to education included a Stream and Watershed Analysis Workshop sponsored by the Mendocino RCD. Registration for this workshop quickly filled—with a long waiting list—showing the need for the types of information presented: stream assessment, watershed and fish habitat analysis, geomorphic analysis and application of assessment systems in relation to the Forest Practice Rules.

Watershed Analysis and Timber Harvest

State Board staff also were involved in the Watershed Academy, an educational effort to provide the information fundamentals needed by forestry professionals to understand the elements of watershed analysis and land use risk assessment. The goal was to link these analytical tools and thought processes to maintenance of healthy, productive watersheds and healthy stream systems. Solid understanding of these concepts facilitates development of Sustained Yield Plans; helps support sensitive watershed nominations to the Board of Forestry; provides an approach for addressing Total Maximum Daily Loads' (TMDLs) issues, and aids in the assessment and review of cumulative watershed effects for timber harvest plans.

Sponsored by the Board of Forestry and coordinated by Humboldt State University, the academy ran for four days covering subjects ranging from fluvial geomorphology to benthic macroinvertebrates and from water quality monitoring to data management. Following completion of the course, State Board staff participated in an intensive review



to shorten and redesign the material so as to create better understanding of the relevance and importance of the information presented for the audience's daily needs and activities.

Based on this review, the course is being redesigned in modules that will facilitate the training of key industry, agency, and organizational representatives who then will be qualified to train their peers.

Protection of Wetlands Water Quality and Regulatory Streamlining

"We speak of ecological health. What do we mean? A system is ecologically healthy when its condition is stable, its capacity for self repair, when disturbed, is preserved, and minimal external support for management is needed. Ecologically healthy systems protect beneficial uses of water."

Dennis Heimann, Central Valley Regional Water Quality Control Board.

In 1995 the State Board initiated training for Regional Board staff working on issuance of water quality certifications and waste discharge requirements. This step was prompted in part by Governor Pete Wilson's wetlands conservation policy. His 1993 Executive Order and planning document directed State agencies to balance two goals. The first: to ensure no short-term net loss and to achieve long-term net gain in the quantity, quality, and permanence of wetland acreage and values; the second: to reduce administrative complexity in wetlands regulatory programs.

Efforts to remove or seriously degrade wetlands and riparian habitats, often in the name of urban development, continue to this day despite the fact that California has lost over 90 percent of its historic wetlands base. However, projects which may impact wetlands and other water bodies require permits which other activities may not. Because such permit approvals need to be obtained from up to three levels of government—Federal, State, and local—some critics have complained about problems related to timing and coordination and about the potential for project delays due to conflicting requirements. Local government permits are often issued after consideration of only land-use and zoning concerns and tend to be bestowed early in a project's planning period. State and Federal permits are, for the most part, developed in response to water quality, natural habitat, and navigation concerns and are not usually granted until late in the project development process, leading to potential conflicts.

Water quality certification and permit training was initiated by State Board staff to help achieve State wetlands policy goals related to water quality issues. Better understanding of wetland features and functions, definitions of wetlands utilized by various Federal and State agencies, statutory requirements, and interagency coordination and timing issues were seen as key to a more effective and efficient certification process.

Two identical three-day training sessions were provided to approximately 150 attendees in northern and southern California by wetlands consultants and agency staff from the State Board, Department of Fish and Game, Resources Agency, U.S. Army Corps of Engineers, and U.S. Environmental Protection Agency. The State Board employed UC Davis Extension to organize and facilitate the training sessions. Participants' surveys affirmed the value of the training with requests for additional training.

Government Conference on the Environment

Leaders from business, industry, academia, and government in addition to community and environmental leaders came in Sacramento in 1994 and 1995 to attend the annual Government Conference on the Environment.

Workshop topics ranged from using the watershed approach to protect water quality to establishing watershed partnerships and tapping technical and financial assistance to most effectively manage watershed/water quality problems. The unique circumstances of both rural and urban watersheds were considered and case study presentations showcased early watershed management successes.

Speakers ranged from local government officials to business and industry representatives; community leaders and activists to State and Regional Board representatives. The day long sessions on Watershed Management were the most heavily attended of the conferences' many offerings.

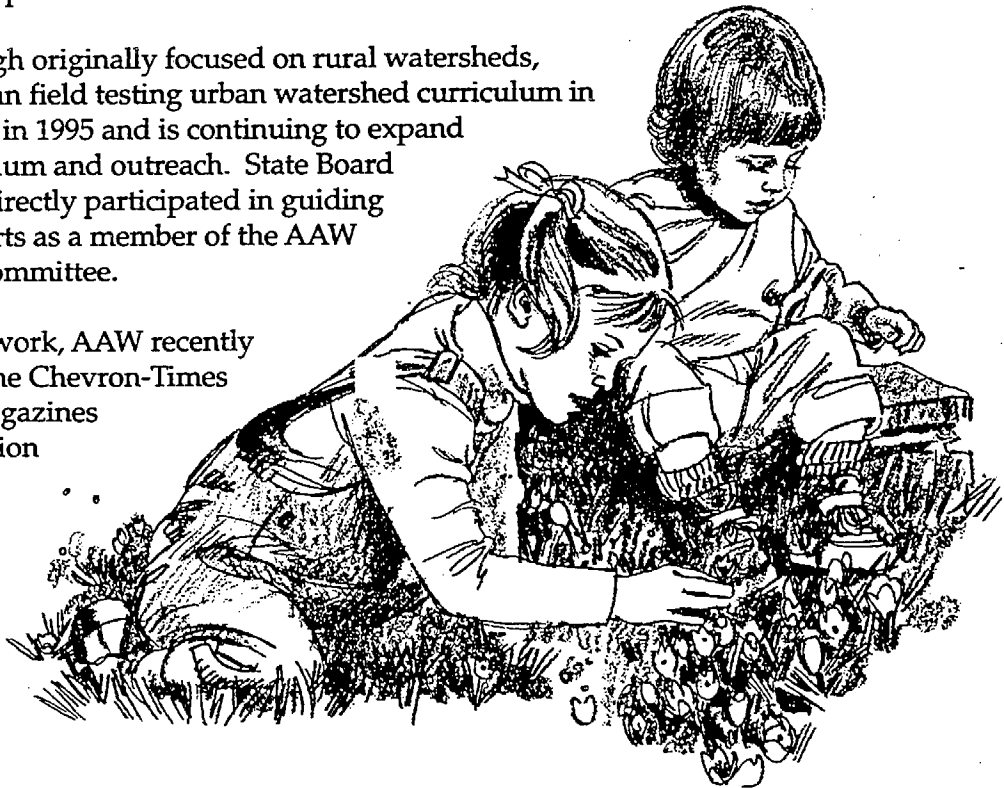
ADOPT-A-WATERSHED

A unique kindergarten through 12th grade educational program begun in 1990 in conjunction with the Trinity River Restoration Program, Adopt-A-Watershed (AAW) has bloomed over the past two years to become one of California's leading watershed education successes. The program includes teaching in and out of the classroom, involving students in on-the-ground activities that lead to first-hand knowledge and understanding of watershed dynamics and water quality, particularly as these relationships play out in the watershed in which they live.

In the process, AAW involves both the community and resource professionals, creating a dynamic model of learning, partnership formation, and the rewards that come with cooperative effort. The activities provide more than education. There are significant returns to the community and the watershed as the children develop and conduct long-term field studies. The computerized data they develop is available to track and identify watershed trends and changes. And the restoration projects that are a key part of the program develop a sense of ownership, responsibility, and stewardship.

Although originally focused on rural watersheds, AAW began field testing urban watershed curriculum in San Diego in 1995 and is continuing to expand its curriculum and outreach. State Board staff has directly participated in guiding AAW efforts as a member of the AAW steering committee.

For its work, AAW recently received the Chevron-Times Mirror Magazines Conservation Award.

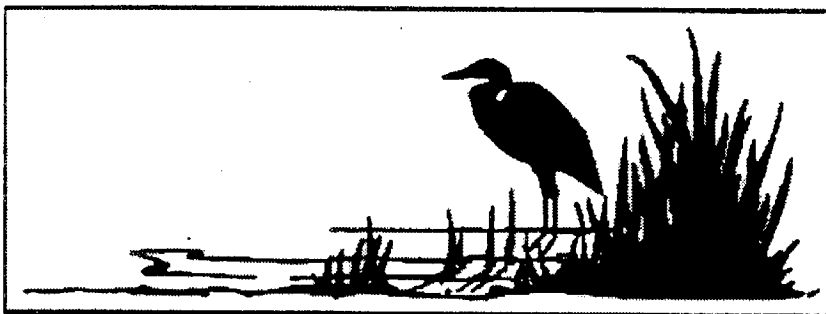


PARTNERSHIPS IN MONITORING--Grassroots In Action

With the typical bravado of "twelve year olds", ~~the two~~ boys sloshed out into the murky waters of a small pond hidden in one of the tidal marshes along the Contra Costa County shoreline east of Carquinez Strait.

They were after grab samples to bring back to their classmates on shore. Paired off in teams, the

other students waited impatiently for the water samples, which they would use to perform various water quality measurements. Of most interest to the two boys in the water though was the Salinity Conductivity Temperature (SCT) meter they were carrying to measure the water's electrical conductivity, a surrogate measure for the water's salt content. After settling the argument over who would do what, one held the probe in the water, while the other shouted back the numbers registered on the meter to their instructor on shore. The data being collected by the students will be used to evaluate sites for a future Wetlands Education Center.



On an early ~~March morning~~ morning along Coyote Creek in northern Santa Clara County, volunteers braved the damp and the cold to set up mist nets--two of the eight strung through the riparian area that runs along one side of the Creek. It is pre-dawn and the birds have not yet begun to move about to see the nets being raised. This time of year, the nets catch both neotropical migrants and residents. After they are caught the birds are quickly weighed and identified, and if they have not been caught before, they are banded. It is all part of a larger study to track both the health and numbers of the bird population, the critical role played by riparian corridors in maintaining bird and mammal populations and the elements and dynamics of healthy riparian corridors and healthy stream systems. Analysis of the data will be used in making riparian corridor/flood control management decisions.



In southern California, volunteers gathering data for the Santa Monica Bay epidemiological study, part of the Santa Monica Bay Restoration Project, rose in the early morning hours to brave Los Angeles area freeway traffic. They drove over 60 miles to collect samples at three different bayside locations; delivered the samples to a lab in El Segundo before 8 a.m.; and then went on to their own jobs. The epidemiological study, the first of its kind in the nation, continued for more than three months with daily collections of water samples required. Study results revealed that Santa Monica Bay "beach-goers" who swim near storm drains are nearly 50 percent more likely to contract colds, sore throats, diarrhea, and other illnesses than those who swim further away in cleaner water.

In various settings and with various participants, such scenarios as these are repeated throughout California. Volunteers are monitoring the health of their creeks and rivers, lakes and estuaries, and bays and ocean waters. They are learning about DO (dissolved oxygen) and fecal coliform. They have developed an appreciation for the rigor of protocols and QA/QC (Quality Assurance and Quality Control). They have become guardians of wetlands and riparian areas as they have learned about the immense importance of these ecosystems in protecting water quality, wildlife, and human health.

There are no hard numbers on the number of groups doing some level of citizen monitoring outside educational settings, but a recent State Board sponsored survey identified 50 active monitoring groups statewide.

Until 1994 many volunteer monitoring groups operated in isolation, usually in response to a threat to a favorite water body about which they were concerned or as part of an educational program. A few knew about the Regional Boards and went to them for help and guidance. Then in 1994, the State Board created a Volunteer Monitoring Advocate position. Since then, an impressive sequence of activities have been initiated to help active volunteer monitoring groups improve data collection, provide start-up information to others, and create connections between data collectors and agency users. Their accomplishments are as follows:

- One of the outstanding early successes was the recruitment of volunteer monitors to collect rainfall diazanon data for the Central Valley Regional Board. From previous work, Regional Board staff suspected there was a problem but needed better information on the temporal and spatial extent of the problem and the sources.

- Through the Sacramento Urban Creeks Council approximately 15 volunteers in and around Sacramento and Stockton were enlisted and trained to gather rainfall and runoff samples. Most of the volunteers lived close to the creeks they were monitoring. Analysis of the samples showed that in over 95 percent diazanon was detectable and in most of these samples, levels measured above the Department of Fish and Game draft Hazard Assessment Levels of 30 parts per trillion (ppt). Samples ranged from 40 ppt to as high as 300 ppt, with the highest readings tracking the use of dormant spray on orchards. Diazanone use was clearly both an urban and agricultural problem.
- To tackle the urban problem, Central Valley Regional Board staff began working with RWQCB staff from the San Francisco Bay area where diazanon also had been detected in creek waters. They formed a joint study group to devise solutions and decided to focus their initial efforts on outreach and education. In the belief that certain product formulations may be causing most of the problems, they have undertaken an analysis of (1) formulations, (2) point-of-sale store/consumer product information, (3) use/disposal patterns, and (4) tracking how diazanon moves off site. From this, they will devise an educational outreach program intended to bring diazanon pollution under control.

Meanwhile, the Volunteer Monitoring Advocate, working through the San Francisco Estuary Institute and the San Francisco Bay Volunteer Monitoring Steering Committee, initiated a survey of the needs of both volunteer groups and government agencies.

The survey showed that coordinated monitoring activities could be established between agencies and local volunteer groups, and that the flow of information developed could increase understanding about environmental conditions and effective ecosystem management. One of the concerns expressed was that volunteers be able to follow established protocols and quality control procedures. Regional protocols are now available on-line on the Internet (<http://www.sfei.org>) and are being field tested.

Volunteer monitoring training is ongoing and in the San Francisco Bay Area two new Riparian Stations, built upon the successful model at Coyote Creek, are in the development process, partially supported by CWA Section 319(h) funding. Within major watersheds, Riparian Stations are being designed to function as centers for coordinating and implementing locally based watershed resource inventories, environmental education, and monitoring.



The organizational frameworks to support regional volunteer monitoring in the Los Angeles and Sacramento areas are now under development.

The State Board Volunteer Monitoring Advocate also participates in organizing and presenting a yearly Volunteer Monitoring Conference in the San Francisco Bay area which attracts participants from throughout California. Program emphasis is on creating the infrastructure for a successful volunteer monitoring program; setting monitoring goals; various kinds of monitoring protocols; quality assurance and training; managing data; working with volunteers; and working with educators and students.

A "how-to" guide on how to start a volunteer monitoring program is also available.⁶

Monitoring for CWA Section 319(h) Projects

For CWA Section 319(h) projects, monitoring is a key project element, sometimes before, but always during and after project implementation. From chemical water quality testing to photo documentation, from habitat evaluation to wildlife counts monitoring plays a significant role in helping landowners and managers recognize water quality problems and their sources on the lands they manage. And as landowners change their management practices, monitoring documents the changes that occur as the result of BMP implementation, providing information shared with others through the CWA 319 (h) project educational component. (See Completed Projects Matrix.)

Regional Board CWA Section 319(h) project managers work closely with project proponents to set up monitoring protocols and interpret and present results.

Among the most intensively monitored projects were the stream restoration projects implemented by the Feather River CRMP on Wolf Creek and Greenhorn Creek in Plumas County. The Plumas County Community Development Commission in cooperation with the Plumas Job Training Center and the Greenville and Quincy High School Districts developed an intensive summer monitoring program to evaluate the effectiveness of stream restoration work and support a hands-on education program linked to local community needs and provide students with the job skills necessary to become stewards of their watershed.

"Farms are complex systems. Wholesale changes in cultural practices are barriers to adopting ecologically-based methods. To build [growers'] confidence in applying erosion and sedimentation control measures, [monitoring] data will be gathered by cooperating farmers, their ag consultants and pest control advisors."

Michael Simmons, Ventura County Resource Conservation District

⁶ Contact Michael Rigney at the San Francisco Estuary Institute, 1325 South 46th Street, Richmond, CA 94804. Telephone (510) 231-9540 or Gwen Starrett, SWRCB, Nonpoint Source Unit, 901 P Street, Sacramento, CA 95814.

In their monitoring activities, the students used temperature data loggers; established and conducted stream cross-section monitoring; performed instream habitat analysis (including thalweg depth, stream width, stream shade cover, substrate shade cover, and substrate classification) and monitored other parameters as necessary.

Summer work was followed by monitoring in conjunction with a year-long high school science program focusing on water quality, habitat, and aquatic resources. A long-term Monitoring Strategy, including the chemical, physical, and biological parameters to be monitored, was developed; and responsible roles and parties for an ongoing stream monitoring program for the two creeks was identified.

In Sonoma and Marin Counties, Americorp representatives are working with dairy owners in the design and implementation of monitoring programs to track water quality effects from CWA Section 319(h) project changes in management practices.

In southern California, the Los Angeles Regional Board has begun development of a model to link water quality parameters with land-based physical processes and ecosystem impacts. In collaboration with a diverse group of professionals from academia, Federal, State, and local agencies and other knowledgeable parties, they are attempting to develop a monitoring and modelling plan for the Malibu Creek Watershed that can serve as a paradigm for other southern California watersheds.

The goal is to be able to set hard numbers that will reflect the water quality parameters necessary to protect resources: for example, to determine the tolerable range of pH (an alkaline/acidity measure) necessary to maintain native biodiversity in a specific water body. Regional Board staff recognizes that the setting of such numbers is not an exact science, but the numbers are a starting point that can be refined over the years as more experience and information is developed.

MONITORING--As It Is Today

Monitoring related to nonpoint source pollution has moved beyond traditional water quality/water column monitoring to a broader resource definition. It is one that more accurately reflects our emerging understanding of the relationships between land use practices, the nature and benefits of a healthy water environment, and the influential role played by riparian areas and wetlands in maintaining water quality.

It is not that traditional chemical and physical water quality tests are not performed. They are. But better understanding of the land/water interface has led us into broader measurements that reflect biological processes over time and give us better indications of the extent to which we are protecting beneficial uses.

The land use practices and conditions that have resulted in nonpoint source pollution have a long history. We will have to forge a NEW history of changed land uses and different management practices before we will see the water column/water chemistry results and biological improvements that tell us we are adequately protecting beneficial uses. In some cases this could take many years.

In the meantime, tracking changes in management practices and the condition of the land provide the best indicators that what we are doing is working.

When we think in terms of "measurements of success", these measurements must also reflect the incremental steps needed to bring nonpoint source pollution under control. This was well expressed in a presentation to the State Board on implementation of the Rangeland Water Quality Management Plan.

Acknowledging that we probably would not immediately see changes in traditional water quality parameters, the following were cited as guideposts indicating success: (1) rangeland owner and manager participation in water quality training; (2) completion of nonpoint source self-assessments; (3) completion of ranch water quality plans and letters of intent; and (4) implementation of practices proposed in plans and letters of intent.

Only after these earlier steps are in place and have had time to work does documentation of water quality improvements become possible.

WORKING FOR A MORE EFFECTIVE PROGRAM

The State Board has engaged in a variety of activities developed over the past two years to ensure the effectiveness and efficiency of the nonpoint source control program. These include:

CWA Section 319(h) Contract Management Training

In 1994 a State contract training program was begun for Regional Board contract managers and recipients of CWA Section 319(h) grant awards. For many recipients, this was their first experience contracting with the State. Knowledge and understanding of the various requirements and deadlines are essential so as not to risk losing grant funds.

The contract training class not only precluded potential problems but gave grantees a head start in developing their work plans and budgets. The class also gave Regional Board contract managers and recipients a chance to meet each other--many for the first time--to begin their working relationship. A follow-up quarterly newsletter provides all contractors with up-to-date problem-solving information and reminders.

Reviewing 319(h) Project Implementation and Results

In an "on-the-ground" review of CWA Section 319(h) projects, State and Regional Board staff visited representative projects to evaluate the success of the State Board strategy to concentrate early funding on key demonstration projects that would serve as examples of implementation of nonpoint source control within watersheds and within industries. Based on this review, changes were made in project evaluation, including the requirement that projects be part of a total watershed plan and strengthening of the monitoring and educational elements.

Tracking Down Abandoned Mine Sites

California's rough-and-ready mining history has left a number of abandoned mine sites. Some of the sites were well known—even notorious for their fish kills and downstream effects on drinking water supplies. However, not much was known about many of the others. For example: exactly how many there were and the true extent of their water quality legacy were both open questions.

Estimates for abandoned sites ranged from 15,000 to as high as 40,000. Of those identified, at least 100 were known to cause pollution problems or, at least, strongly suspected of doing so. Mercury and acid mine drainage were the primary pollutants.

To get better information regarding the numbers and conditions, State Board staff became involved in two surveys. The first was directed at providing counties with a database of information on abandoned mine locations. This had become essential information for county land use decisions. A number of previous decisions had resulted in approval of subdivisions on contaminated sites, particularly in the rapidly expanding Sierra foothills where some home buyers had suffered serious health effects. To help prevent a repeat of this scenario, staff worked with the Department of Toxic Substances Control to develop protocol for the counties to use in determining if the waste on abandoned mine sites is a health threat.

In the second survey, staff assisted the U.S. Forest Service in field testing previously mapped abandoned mine sites on forest service lands to determine which were safety and/or pollution hazards. Although many were found to be safety hazards; fortunately, few were determined to be pollution hazards.

State Board staff works closely with other mining related state and federal representatives to keep informed on the most recently developed technologies regarding cost-effective cleanup and pollution control. By pooling the resources of a number of agencies, they are able to effectively locate, test, cleanup and monitor those projects with the most serious water quality impacts.

State and Regional Board staff also provide ongoing technical assistance and advice to watershed groups where active or abandoned mining activities are a component of nonpoint source pollution. Their most recent work has been concentrated in the Cache Creek and the Sacramento River Watersheds and in the New Idria section of the Central Coast Range where abandoned mercury mines are concentrated.

Providing Technical Services

The groundwork was laid by the State Board to provide GIS and GPS service to the Regional Boards for projects where these capabilities were not already available. Going into 1996 many watershed groups working through the Regional Boards are taking advantage of the availability of these services to facilitate and improve the rigor of the work they are doing in targeted watersheds.

Moving Into the Future

Consolidating what had been learned from implementation of the nonpoint source control program over the previous years, the State Board, in June 1995, adopted a "Strategic Plan" calling for a Watershed Management Initiative (WMI) to guide a portion of future State and Regional Board water quality control efforts. This was followed in September 1995 by Board adoption of a second document, "Initiatives in Nonpoint Source Management". This document further delineated the watershed approach as it applied to nonpoint source management, integrating recommendations developed by the Technical Advisory Committees that could be implemented in the near future. Subsequently, Watershed Management Initiative Plans were developed individually by the State and Regional Boards to guide their implementation of the watershed approach.

The State Board plan focuses on overall policy, implementation strategies, coordination and statewide issues. Each Regional Board plan focuses on designated watershed management areas. Watersheds, problems and program activities are being prioritized. The plans also describe other water quality efforts undertaken on a regionwide basis to satisfy CWA mandates and other needs.

Within each watershed, members of the watershed community will participate in identifying and assessing water quality problems; and identifying potential BMPs and implementation activities as well as the parties responsible for implementation. They also will participate in determining the necessary follow-up monitoring activities to track pollution control results.

To further facilitate implementation, the State and Federal grant processes are being integrated including 205(j) planning grants and 319(h) implementation grants. This way, dollars will be most effectively directed toward the state's most serious water quality problems.

APPENDIX A

**Clean Water Act §319(h) Grant Funded Projects
Completed During 1994 and 1995**

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
Region 1			
STRING CREEK, tributary to TOMKI CREEK, Mendocino County.	Excessive sediment from historic logging, grazing & road building have destabilized the stream, destroying fishery habitat.	Control erosion sites with riprap, brush mattresses and restoration of riparian vegetation Stabilize gravel terraces.	Photo documentation before and after implementation.
Mendocino County RCD.* Goal: Restore anadromous fish to historic levels			
TRIBUTARY TO SANTA ROSA CREEK Education - Stormwater control. Piner High School, City of Santa Rosa* Reduce pollutants entering storm drains. Educate community re. NPS.	Typical urban runoff pollutants: pesticides, heavy metals, nutrients, etc.	Design/construction of alternate ways of treating urban runoff from high school grounds. Produced brochures for sewer & water bill inserts. Developed & taught grade school curriculum. Conducted community survey & made public presentations.	Both interceptor & swale removed pollutants at the scale tested. The swale is only effective, however, combined with a bubble-up structure. Both designs left unanswered questions for further testing.
AMERICANO CREEK	High un-ionized ammonia and low dissolved oxygen concentrations.	Wetland construction. Management of animal waste applications. Construction of a riparian corridor. Construction of a filter strip. Controlled liquid waste application. Construction of a secondary reservoir and improved distribution of manure. Construction of a permanent underground water system.	Individual monitoring programs developed for each management application. Preliminary results show that only the filter strip had not been effective.
STEMPLE CREEK	High nutrient levels & copper concentrations. Erosion and sedimentation. Excess manure disposal to land led to waste deposition in waterways. Stream-banks trampled and riparian cover destroyed.		
LAGUNA DE SANTA ROSA tributaries to Tomales Bay Dairy animal waste control demonstration/technology transfer. Gold Ridge RCD.* Increase tidal exchange in Americano Estero. Improve fishery habitat and water quality.			

*Project sponsors. All projects were grant funded in previous years.

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
<p>STREAMS capable of providing salmon & steelhead habitat. Education/training Stream & watershed analysis workshop. Mendocino Co. RCD* Goal: Restore salmon and steelhead.</p>	<p>Northern California streams have been significantly impacted by historic logging & grazing practices. Sedimentation, eroding streambanks, loss of deep pools and compaction of spawning gravels are significant problems, as are high temperatures from lack of riparian vegetation.</p>	<p>Education/training on stream & fish habitat classification systems, relationship between channel form and process in riverine ecosystems and geomorphic process in relationship to the design and suitability of habitat restoration techniques.</p>	<p>Education/training on data collection techniques & recording & interpretation of evidence of fluvial processes.</p>
<p>TECHNOLOGY TRANSFER. Video on Tomki Creek and Garcia River experience. Mendocino County RCD.*</p>	<p>Degradation of streams from loss of fishery & wildlife habitat, loss of riparian vegetation.</p>	<p>Being used in schools and by stream/watershed restoration groups.</p>	<p>Includes segment on monitoring.</p>
<p>KLAMATH RIVER--Phase I Develop a computerized information system--KRIS (Klamath Resource Information System) integrating Federal & State resource information, supplemented by data acquired by trained volunteers. Test prototype. Klamath River Basin Fisheries Task Force c/o U.S. Fish & Wildlife Svc.* Goal: design a computer information system to assist salmon & steelhead fishery.</p>	<p>NPS pollution from elevated temperatures, sedimentation and loss of habitat have severely degraded the anadromous fishery.</p>	<p>Surveyed Klamath River Basin agencies, tribes & community groups to determine data resources and needs and computer resources. Selected KRIS' configuration: a PC base using EPA Reach File 3 & Paradox, with map coverage in ArcInfo & ArcView. Tested prototype in Shasta River sub-basin.</p>	<p>Ongoing information collection and data input & analysis provides a continuing assessment of water quality changes and resource improvements in response to Klamath River restoration activities.</p>

*Project sponsors. All projects were grant funded in previous years.

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
KLAMATH RIVER -- Phase II			
Develop a comprehensive fisheries and water quality database to directly support work of fishery restoration projects by identifying limiting conditions, and potential future problem areas, and to gauge success of restoration efforts. Determine interfaces needed for GIS display and management. Expand KRIS use.		Surveyed available information. Provided an inventory of the various kinds and levels of studies and information available for targeted watersheds. Identified additional information needs. Tied stream reach based hydrographic data to other watershed data for GIS display & management. Expanded participation of tribes, agencies & citizen groups participating in KRIS.	Volunteers spent over 7,000 hours on Klamath restoration activities including counting fish & spawning run & collecting seeds, growing & planting riparian vegetation. Landsat images used to track logged & burned vegetation patterns. Riparian Aerial Photography Inventory of Disturbance (RAPID) & historic aerial photos used to trace sediment pulses through system.
Region 2			
WALNUT CREEK, Contra Costa County	Storm drain and storm water pollution from construction, pesticides, fertilizers and other surface runoff, storm drain oil, paint products and other toxic dumping.	Public Service announcements. Print and billboard displays. Community newsletters and newspaper stories. Point-of-sale educational handouts. Grade specific educational materials for schools.	Develop a citizens water quality monitoring program known as "Watershed Watchers".
Lindsay Museum*		Developed a document to interest and alert media representatives on issues related to NPS pollution: "Changing the Course of California's Water". Developed a handbook, "Culvert Action", on how to carry out a media campaign on NPS issues. Within the Walnut Creek watershed,	Monitored use of material and press event coverage through tracking of actual media coverage: print, radio and television. Watershed Watchers Program has been expanded.
Lindsay Museum*	Statewide prevention of NPS contamination through storm drains and other runoff sources.		
Above program expanded statewide.			

*Project sponsors. All projects were grant funded in previous years.

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
		expanded use of all materials developed.	
NAPA RIVER WATERSHED Napa Co. RCD.* Developed Napa River Watershed Owner's Manual & Educational materials re. NPS pollution Goal: Stabilize streams by natural methods. Develop habitat & biological diversity. Increase fish habitat. Reduce soil erosion. Improve water quality.	High sediment loads. NPS pollution from agriculture, abandoned mine drainage and stormwater runoff from urban areas.	Land stewardship groups formed for tribu- tary creeks. Educational presentations at community events. Ongoing educational/ storm drain stenciling program. Adopt-a- Watershed program implemented in pilot schools.	Monitoring is a component of the Adopt-a-Watershed Program.
WILDCAT CREEK (Contra Costa County) tributary to San Francisco Bay. East Bay Regional Pk. Dist.* Goals: Reduce sediment load. Restore steelhead fishery.	Sedimentation from on-going erosion of channel banks & under- cutting of active slides.	One of first in Calif. to use Rosgen method of stream restoration. Reconfigured channel. Recreated step-pool sequences. Revegetated.	Monitoring plan to verify vegetation establishment & hillslope stability.
Region 3			
MORRO BAY ESTUARY Los Osos Ck. & Chorro Ck. Coastal San Luis RCD.* Sediment Control Demonstration Project. Goal: Reduce sediment delivery to Morro Bay.	Bay has lost 25% volume over past 100 years. It is the most extensive & valuable estuarine/ intertidal ecosystem between Santa Barbara (100 mi. south) & Elkhorn Slough (100 mi. north).	29 sites-various landowners. Implementation measures included: streambank protection, gully treatment, cropland conversion, water system development, buffer strips, grass waterways, fencing, stream clearing, under- ground outlets and land management plans. Goal: reduction of 3,700 tons of soil loss from erosion. Estimated that goal was exceeded by 116,059 tons.	Morro Bay is a component of the EPA Clean Water Act Section 319(h) National Monitoring Program. Water quality is monitored on a regularly timed basis watershedwide. This is a ten-year monitoring program. A citizen volunteer monitoring project is in development.

*Project sponsors. All projects were grant funded in previous years.

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
<p>LOWER SAN LUIS OBISPO CK. Land Conservancy of SLO Co.* Riparian restoration to reduce NPS flows into creek. Goals: Restore contact/non-contact recreation, fish migration & spawning habitat.</p>	<p>High nutrient loading, elevated temperatures, and sedimentation.</p>	<p>Acquisition of conservation easements & riparian restoration. Exclusionary fencing to remove cattle. Actions have led to a new initiative to create a "City to the Sea" riparian trail and bikeway.</p>	<p>Monitoring of vegetation to track survival & need for re-planting. Assessment of survival rates for various plants.</p>
Region 4			
MUGU LAGOON			
<p>Calleguas Ck. Watershed. Revolon/Beardsley sub-watershed. Irrigation Management. Vantura County RCD*</p> <p>Goal: Restore habitat in the largest remaining undisturbed salt marsh in Southern Calif. *Area of Special Biological Significance"</p>	<p>Sediments, pesticides & nutrients</p>	<p>Installation/comparison of two types of drip tape to conventional furrow irrigation. Evaluation of overhead sprinklers for preplant & transplant irrigation. Irrigation scheduling based on tested soil moisture levels.</p>	<p>Implementation monitoring of recommended practices. Ten percent of cooperators monitored to assess effectiveness of implemented practices. Project resulted in restoration of 14 acres of Palustrine wetlands. Results: reduced runoff levels of nitrates & TDS with drip system. Water use reduced and crop yields improved.</p>
SANTA MONICA BAY BASIN			
<p>Storm drain stenciling & public education campaign. Heal-the-Bay.*</p> <p>One element of a larger Santa Monica Bay restoration project.</p> <p>Goal: Improve beach conditions and bay water quality for recreation.</p>	<p>Each rainy day up to 15 billion gallons of toxic urban runoff reaches Santa Monica Bay. Even on dry days, 25 million gallons flow through storm drains and on to beaches.</p>	<p>Designed graphic for storm drain stenciling. Recruited volunteer leaders from participating community to implement stenciling and survey.</p>	

*Project sponsors. All projects were grant funded in previous years.

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
REGION 5			
SACRAMENTO RIVER			
U.C. Cooperative Extension & Soil Conservation Service*	Pesticide and Herbicide loading to the Sacramento River, particularly molinate & thiobencarb.	Tail water management demonstration sites in Colusa, Glenn & Sutter Counties.	Regularly scheduled monitoring at all sites. The 1995 update of the California Rice Pesticide Program on monitoring of molinate, thiobencarb, carbofuran, methyl parathion & malathion shows only detectable levels of molinate in the Sacramento River. However, concentrations of all five chemicals found in at least one Sacramento Valley agricultural drain during May & June.
Irrigation Management to reduce off-site movement of rice field herbicides.		On each, three water management systems tested: flow-through, recirculating & static.	Aerial drift & seepage are believed to be the prime sources.
Goal: Eliminate fish kills attributable to rice tailwater discharges & restore drinking water quality.			
MIDDLE CREEK			
Shasta County tributary to the Sacramento River. Western Shasta RCD*.	Accelerated erosion rates & sediment deposition from grading for roads and housepads without adequate erosion control measures.	Erosion control BMPs implemented along fire access roads and demonstration sites. Forty acres treated. Sediment catch basin constructed.	Monitoring of seed blends used in hydromulching to determine appropriateness for area. Monitoring of BMPs to determine erosion control effectiveness. RWQCB monitoring during storm events for turbidity, suspended sediments and settle-able solids. Erosion & Sediment Control Manual developed by RCD adopted by county as part of construction & grading standards.
Goal: Protect prime Middle Creek steelhead spawning grounds and Sacramento River winter run salmon spawning gravels.	Slug of sediment waiting to move downstream into prime salmon & steelhead spawning grounds.		

*Project sponsors. All projects were grant funded in previous years.

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
WOLF CREEK			
Plumas County tributary to the Feather River.	Heavy sediment load from past timber harvest & grazing practices had destabilized banks & channel of Wolf Creek. Floods threatened Greenville homes & sediment accumulation threatened PG&E Feather River power facilities.	Creek reconstructed using geomorphic techniques including restoration of meanders and bank stabilization using natural materials and vegetation. Twenty-nine acres of flood plain reconstructed.	Monitoring for two years using trained Greenville Community High School students.
Plumas Corporation for Greenville Community Services District*.			
Goal: Control flooding in the town of Greenville. Reduce sediment load in Wolf Creek & the Feather River.			
DOLLY CREEK & LITTLE GRIZZLY CREEK			
Plumas County	Heavy metal contamination, esp. copper, zinc & cadmium from 100 acres of mine tailings, 20 feet deep, draining via Dolly & Grizzly creeks into Indian Creek.	Geomorphic channel reconstruction & revegetation. Wind fences installed to control wind driven silica pollution. Five acres of wetland developed to demonstrate passive, biological treatment of water leaching from the mine tailings. Plumas National Forest to continue vegetation & stabilization work on upper tailings & expand wetland area.	Five year monitoring program to assess impact of remediation measures.
Plumas Corporation*			
Goal: Control of heavy metals & drainage from mine tailings.			
SAN JOAQUIN RIVER			
West Stanislaus RCD*	Pesticides entering the San Joaquin River including DDT compounds, toxaphene, diazaron, parathion, carbaryl carbofuran & diuron.	Eighteen BMPs, inc. managerial, structural and/or vegetative, tested on eight crops. Broad outreach & technical transfer program implemented.	Daily monitoring of agricultural activities and water sampling stations. All practices reduced some movement of sediment. Use of various BMPs in combination gave best results.
Goal: Reduce toxic levels of pesticides in agricultural drainage entering the San Joaquin River.			

*Project sponsors. All projects were grant funded in previous years.

CWA 319 PROJECTS COMPLETED DURING 1994 & 1995

WATER BODY	W.Q. PROBLEMS	IMPLEMENTATION	MONITORING
REGION 6			
UPPER TRUCKEE RIVER El Dorado County*	Sediments, nutrients and road salt entering drainageways and eventually the Truckee River.	Paved the unpaved section, constructed sand and sediment traps and curbs, revegetated slope.	
Goal: Control sediments and contaminated runoff into the Truckee River from an unpaved bike trail and road shoulder.			
EAGLE LAKE			
Honey Lake RCD*	Heavy sedimentation and nutrient contamination from grazing along shore areas and trails from upland grazing areas. Destruction of riparian areas.	Installed fences & cattle guards. Developed upland water sites. Drilled wells, developed springs & installed pumps.	Nine photo monitoring sites document regrowth of riparian vegetation. U.S. Forest Service will carry out monitoring activities.
Goal: Improve water quality to benefit threatened Eagle Lake trout by removing cattle from riparian & nearshore areas.			
REGION 7			
PEACH DRAIN/SALTON SEA			
Imperial Irrigation District*	Sediment & toxic pesticides, selenium and DDT chlorinated hydrocarbons.	Constructed sediment retention basin.	Silt accumulation measured throughout duration of project. Water column & sediment sample analysis of selenium, silt size fraction and pesticides.
Goal: Improve water quality in Peach Drain which discharges to the Salton Sea.			

*Project sponsors. All projects were grant funded in previous years.

APPENDIX B

Contacts for Nonpoint Source Funding and Project Information

State Water Resources Control Board Grant Information

For information on CWA 319(h) Implementation and 104(b) Watershed Initiative Grants contact:

John Ladd, Chief
Nonpoint Source Section
901 P Street
Sacramento, CA 95814

For information on CWA 205(j)/604(b) Planning grants contact:

Paul Lillebo
Water Quality & Basin Planning Unit
901 P Street
Sacramento, Ca 95814

Or contact your Regional Water Quality Control Board.

A map showing each Regional Board's jurisdiction and its address is on the back inside cover.

Additional Grant Information

For information on CWA 104(b) Wetlands grants, contact:

Craig Denisoff
The Resources Agency
1416 Ninth Street
Sacramento, CA 95814

The 1995 publication, WATERSHED RESTORATION—A Guide for Citizen Involvement in California by Kier (William M.) Associates, provides extensive information on local, state and federal as well as private funding sources in addition to information on effective involvement in watershed resource issues. The report is available from:

I. Sheifer
Coastal Ocean Program
1315 East West Highway
Silver Spring, MD, 20910
(301) 713-3338 fax:(301)713-4044
e-mail: Isheifer@COP.NOAA.GOV

The following organizations have completed or are currently implementing nonpoint source control projects using CWA section 319(h) funds. Many have developed outreach or educational materials in connection with their projects.

State Agencies

CA Coastal Conservancy
1330 Broadway, Suite 1100
Oakland, CA 94612
(510) 286-1015

CA Department of Parks and Recreation
Sierra District Headquarters
P.O. Drawer D
Tahoma, CA 96142
(916) 525-4114

Department of Fish and Game
Water Pollution Control Laboratory
2005 Nimbus Road
Racho Cordova, CA 95670
(916) 355-0856

Local Government

City of Monterey
City Hall
Monterey, CA 93940
(408) 646-3920

City of Santa Rosa
69 Stoney Circle
Santa Rosa, CA 95401
(707) 543-3944

City of Watsonville
City Hall, P.O. Box 50000
Watsonville, CA 95077-5000
(408) 728-6093

East Bay Regional Park District
2950 Peralta Oaks Court, P.O. Box 5381
Oakland, CA 94605-0884
(510) 635-0135

El Dorado Co. Department of
Transportation
1121 Shakori Drive, P.O. Box 7396
South Lake Tahoe, CA 96158
(916) 573-3182

LA Co. Department of Power and
Water
900 South Fremont Avenue, P.O. Box
1460
Alhambra, CA 91802-1460
(818) 458-5118

Lake Co. Flood and Water Cons.
District
255 N. Forbes Street
Lakeport, CA 95453
(707) 263-2364

Statewide Organizations

California Association of Resource
Conservation Districts
801 K Street, Suite 1318
Sacramento, CA 95814
(916) 447-7237

Community Alliance w/ Family
Farmers
P.O. Box 363
Davis, CA 95617

Water Education Foundation
717 K Street
Sacramento, CA 95814
(916) 444-6240

Regional Organizations

Klamath River Basin Fisheries Task Force
c/o U.S.FWS
P.O. Box 1006
Yreka, CA 96097-1006
(916) 842-5763 Fax:(916) 842-4517

Imperial Irrigation District
P.O. Box 937
Imperial, CA 92251
(619) 339-9426

San Francisco Estuary Institute
1325 South 46th Street
Richmond, CA 94804
(510) 231-9539 extension 731

Resource Conservation Districts (RCD's)

Alameda Co. RCD
1560 Calatina Court
Livermore, CA 94550
(510) 447-0749

Cachuma RCD
624 B W. Foster Road
Santa Maria, CA 93455
(805) 932-6363

Coastal San Luis Obispo RCD
545 Main Street, Suite B-1
Morro Bay, CA 93442
(805) 772-4391

Colusa Co. RCD/NRCS
100 Sunrise Boulevard, Suite B
Colusa, CA 95932
(916) 458-2931

Elsinore/Murrieta/ Anza RCD
24280 Washington Avenue
Murrieta, CA 92562
(909) 677-9182

Gold Ridge RCD
825 Gravenstein Highway, N. Suite 6
Sebastopol, CA 95472
(707) 795-2498

Goose Lake RCD
1030 North Main Street, Suite 101
Alturas, CA 96101
(916) 233-4137

Honey Lake RCD
170 Russell Avenue
Susanville, CA 96130
(916) 257-6363

Inland Empire West RCD
2816 East 4th Street
Ontario, CA 91764-4601
(909) 987-0622

Marin Co. RCD
520 Mase Road, P.O. Box 219
Point Reyes, CA 94956
(707) 874-0100

Mendocino Co. RCD
405 Orchard Avenue
Ukiah, CA 95482
(707) 486-9223

Napa Co. RCD
1303 Jefferson Street, Suite 500B
Napa, CA 94559
(707) 252-4188 Fax: (707) 252-4219

San Mateo Co. RCD
785 Main Street, Suite C
Half Moon Bay, CA 94019
(415) 726-4905

Sotoyome-Santa Rosa RCD
P.O. Box 11526
Santa Rosa, CA 95406
(707) 836-0585

Southern Sonoma Co. RCD
1301 Redwood Way, Suite 170
Petaluma, CA 94954
(707) 794-1242

Tahoe RCD
870 Emerald Bay Road, Suite 109,
P.O. Box 10529
South Lake Tahoe, CA 96158
(916) 541-4318

Topanga-Las Virgenes RCD
122 North Topanga Canyon Boulevard
Topanga, CA 90290
(310) 455-1030

Ventura Co. RCD
P.O. Box 147-1380 Somis Road
Somis, CA 93066

West End RCD
8645 Haven Avenue, Suite 360
Rancho Cucamonga, CA 91730
(714) 944-5849

West Stanislaus R.C.D.
218 N. Circulo
Patterson Ca. 95362
(209) 892-95362

Western Shasta RCD
3179 Bechelli Lane, Suite 107
Redding, CA 96002
(916) 246-5252

Local Community Organizations

Deer Creek Conservatory
P.O. Box 307
Vina, CA 96092
(916) 839-2358

Environmental Health Coalition
1717 Kettner Boulevard, Suite 100
San Diego, CA 92101
(619) 235-0281 Fax:(619) 232-3670

Greenville Community Services District
P.O. Box 899
Greenville, CA 95947
(916) 284-7311

Heal-the-Bay
1640 5th Street, Suite 204
Santa Monica, CA 90401
(310) 394-4552

Land Conservancy of San Luis Obispo
P.O. Box 12206
San Luis Obispo, CA 93406
(805) 544-9096

Mill Creek Watershed Conservatory
P.O. Box 188
Los Molinos, CA 96055
(916) 595-4493

Plumas County Community Development
Commission
c/o Plumas Corporation
P.O. Box 3880
Quincy Ca. 95971
(916) 283-3739

Urban Creeks Council
1250 Addison Street, #107
Berkeley, CA 94702
(510)540-6669

Educational Institutions

California Polytechnical University, San Luis Obispo
San Luis Obispo, CA 93407
(805) 756-2548

California Watershed Projects Inventory (CWPI)
Division of Environmental Studies
University of California, Davis
Davis, CA 95616

Lindsay Museum
1901 First Avenue
Walnut Creek, CA 94596
(510) 935-1978

Moss Landing Marine Labs
P.O. Box 450
Moss Landing, CA 95039

Piner High School
1700 Fulton Road
Santa Rosa, CA 95403

San Jose State University Foundation
P.O. Box 720130
San Jose, CA 95172-0130
(408) 633-5606

Southern California Marine Institute
820 South Seaside Avenue
Terminal Island, CA 90731
(310) 519-3172 Fax: (310) 519-1054

University of California Cooperative Extension
University of California, Davis
Davis, CA 95616
(916) 752-9391