

REGIONAL WATER QUALITY NEWSLETTER

DATE: Report for January 19, 2006

Samples Collected on January 17, 2006

From the Phoenix, Tempe, Peoria, CAP, SRP – ASU Regional Water Quality Partnership

PLEASE NOTE THE WEBADDRESS HAS CHANGED FOR OUR PROJECT:

<http://enpub.fulton.asu.edu/pwest/tasteandodor.htm>

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SUMMARY: EVALUATION AND RECOMMENDATIONS

1. Happy New Year
2. MIB and geosmin concentrations are low throughout the system
3. For this spring our newsletters will be put out ~ 1 week after sample collection unless T&O concentrations exceed 8 ng/L. This way we will also include DOC data in our reports in response to recent inquiries by cities to CAP and SRP for more data that influence DBP formation.
4. We are preparing our 2006 Proposal/Workplan and the overwhelming feedback we received favors 1) continue baseline monitoring work, and 2) try to focus on DBPs in 2006 because of the new DBP regulations. So we will try to include a section in each newsletter on DBPs and DOC treatability based upon a WTP.exe model.
5. To further focus on DBPs in 2006 we plan to test a new on-line THM and HAA analyzer developed by researchers as part of an AwwaRF project.
6. We will also be creating a new section on our Regional Water Quality website on DOC, MIB, and DBP projections. Suggestions are welcome at this time.
7. We plan to have a summary report of the 2004 work by the end of February.
8. ASU is submitting a proposal next week on development of a cyberinfrastructure environmental observatory to the National Science Foundation. We thank many of the cities, CAP, and SRP for writing letters of support. Even if this NSF proposal (\$2 million) is not funded, the overwhelming interest to integrate available water quality data will be pursued in some format.

MONITORING RESULTS

Table 2 - Water Treatment Plants – January 17, 2006

Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
24 th Street WTP Inlet	2.3	4.0	2.3
24 th Street WTP Treated	2.2	4.1	<2.0
Deer Valley Inlet	2.6	3.4	5.7
Deer Valley WTP Treated	2.0	4.5	6.4
Val Vista Inlet	2.6	2.9	5.6
Val Vista WTP Treated –East	2.2	4.1	<2.0
Val Vista WTP Treated -West			
Union Hills Inlet	<2.0	2.5	2.3
Union Hills Treated	<2.0	2.2	<2.0
Tempe North Inlet	2.6	5.2	<2.0
Tempe North Plant Treated	3.0	4.4	4.2
Tempe South WTP			
Tempe South Plant Treated			
Chandler WTP Inlet	2.1	6.2	<2.0
Chandler WTP Treated			
Greenway WTP Inlet			
Greenway WTP Treated			

Table 3 - Canal Sampling – January 17, 2006

System	Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
CAP	Waddell Canal	<2.0	3.5	<2.0
	Union Hills Inlet	<2.0	2.5	2.3
	CAP Canal at Cross-connect	2.3	3.8	7.6
AZ Canal	Salt River @ Blue Pt Bridge	3.9	4.1	5.8
	Verde River @ Beeline	2.2	3.5	<2.0
	AZ Canal above CAP Cross-connect	<2.0	3.5	6.4
	AZ Canal below CAP Cross-connect	2.7	3.6	6.1
	AZ Canal at Highway 87	2.6	3.4	<2.0
	AZ Canal at Pima Rd.	2.1	3.9	<2.0
	AZ Canal at 56th St.	2.4	3.7	3.0
	AZ Canal - Inlet to 24 th Street WTP	2.3	4.0	2.3
	AZ Canal - Central Avenue	2.2	4.6	3.9
	AZ Canal - Inlet to Deer Valley WTP	2.6	3.4	5.7
	AZ Canal - Inlet to Greenway WTP			
South and Tempe Canals	South Canal below CAP Cross-connect	2.6	2.3	<2.0
	South Canal at Val Vista WTP	2.6	2.9	5.6
	Head of the Tempe Canal	2.5	3.5	<2.0
	Tempe Canal - Inlet to Tempe's South Plant			
	Chandler WTP – Inlet	2.1	6.2	<2.0

Table 4 - Reservoir Samples – January 17, 2006

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant	Eplimnion	2.2	3.5	<2.0
Lake Pleasant	Hypolimnion			
Verde River @ Beeline		<2.0	3.9	<2.0
Bartlett Reservoir	Epilimnion	2.4	3.1	<2.0
Bartlett Reservoir	Epi-near dock			
Bartlett Reservoir	Hypolimnion	2.0	4.2	<2.0
Salt River @ BluePt Bridge		3.9	4.1	5.8
Saguaro Lake	Epilimnion	4.3	3.7	<2.0
Saguaro Lake	Epi - Duplicate	4.5	3.2	<2.0
Saguaro Lake	Epi-near doc	3.9	2.4	<2.0
Saguaro Lake	Hypolimnion	4.5	<2.0	<2.0
Verde River at Tangle				
Havasu				

Table 6 - SRP/CAP OPERATIONS

Values in cfs, for January 17, 2006

System	SRP Diversions	CAP
Arizona Canal	188	46
South Canal	303	0
Pumping	164	0
Total	655	46

SRP is releasing water from both Verde and Salt River Systems. Salt River release from Saguaro Lake: 175 cfs; Verde River release from Bartlett Lake: 300 cfs. Horseshoe Lake is at 0% capacity.

ASU is submitting a proposal next week on development of a cyberinfrastructure environmental observatory to the National Science Foundation. We thank many of the cities, CAP, and SRP for writing letters of support. Even if this NSF proposal (\$2 million) is not funded, the overwhelming interest to integrate available water quality data will be pursued in some format. A presentation today was made by Westerhoff to the Subregional Operating Group (SROG), and they are endorsing the project also.

Description of the RFP:



Program Announcement : Cyberinfrastructure for Environmental Observatories: Prototype Systems to Address Cross-Cutting Needs (CEO:P)
NSF 06-505

National Science Foundation
Directorate for Biological Sciences
Directorate for Engineering
Directorate for Geosciences
Office of Cyberinfrastructure

Goal: development of practical environmental cyberinfrastructure prototypes and a demonstration of their capability to answer significant environmental research questions.

Two important objectives of this solicitation are:

(a) to help insure that the information infrastructure technologies needed to support the widespread use, for cutting-edge research, of large environmental observing systems are available when needed, and

(b) to help environmental research communities and information technologists gain expertise with the technological challenges of deploying such infrastructure so that cyberinfrastructure design can be integrated properly into observatory design and cyberinfrastructure deployment can be integrated properly into observatory deployment.

ASU ARIZONA STATE UNIVERSITY

<http://www.nsf.gov/pubs/2006/nsf06505/nsf06505.htm>

To address these challenges and to promote Cyberinfrastructure for Environmental Observatories (CEO), this solicitation requests proposals for the development of practical environmental cyberinfrastructure prototypes and a demonstration of their capability to answer significant environmental research questions.

Competitive proposals will be those that pursue an end-to-end approach to an information infrastructure prototype, discuss the types of data involved, the ways in which users might wish to use these data and how use case scenarios will be developed, and that include a plan for the deployment of a prototype that implements these types of uses. (In this context, an "end-to-end" approach means that the prototype, whatever aspect of cyberinfrastructure is the primary focus, must be capable of working with representative data and being operated by representative users performing tasks that are themselves representative of those needed in the pursuit of environmental research or education activities. The term "use case scenario" consists of a description of how a user wishes to use the system, capturing the desired behavior of the system from the user's point of view. It helps to define the set of interactions needed between external users and a system.)

The solicitation focuses on projects that tackle the issue of how to integrate data from different types of observing systems with different disciplinary foci. It encourages projects which develop prototypes that support a wide collection of users and which are readily generalizable. It also urges projects to leverage existing cyberinfrastructure development efforts, for example those supported through ITR, NMI and SEIII, by utilizing and combining software developed in these projects where possible. Similarly, the solicitation encourages the use of existing sources of data rather than making new observations. Extant environmental observational networks are one potentially fertile source of data. They offer the opportunity to leverage existing activities in the development of emerging environmental observing

systems and to produce cyberinfrastructure prototypes that can also advance contemporary environmental research. It is anticipated that successful proposals will involve! ! collaborations between information technologists and environmental researchers from more than one of the following environmental science or engineering fields: ocean science, ecology, atmospheric science, or environmental engineering.

Below is a draft project summary of the ASU proposal (version is 1 week old), but is not the final version.

Arid Region Cyberinfrastructure Hydrologic Observatory for Environmental Research (ARCHER): A Prototypal CyberInfrastructure Environmental Observatory

Historically environmental (air, water and land) observations have been made in isolation, but more recently, in step with the information technology revolution, the focus has been shifted toward cyber infrastructure based environmental observatories built upon cutting-edge sensor and communications technologies, sophisticated models and fusion thereof. These observatories enable massive collection, quality control, archiving and dissemination of data as well as remote access to databases while fostering multidisciplinary participation. They also provide unprecedented opportunities to study complex ecological interactions within and across natural and human systems over a wide range of space-time scales. The collaborative space of cyber observatories allow communities of researchers, practitioners, and policy-makers to come together to share knowledge and information, analyze data, solve problems, and collaborate on publications (CyberCollaboratory). Several organizations, including NSF and EPA, have advocated the need for cyber observatories, and have developed framework documents and planning activities to articulate their viability. This proposal deals with the development and operation of a prototype of a practical CyberCollaboratory -- **Arid Region Cyberinfrastructure Hydrologic Observatory for Environmental Research (ARCHER)**. The proposed observatory covers the metropolitan Phoenix area and its environs as a metaphor for an anthropogenically stressed environment representative of rapidly growing semi-arid/arid areas of the world. A multi-scale approach, involving symbiotic analysis of environmental parameters of the entire domain (consisting of a number of cities spanning several water/airsheds) and a sub-domain (a single city) will be used to demonstrate scale, parameter and spatial coupling. The project will cyber-integrate all accessible sensors in the domain for water and air operated by various organizations; install project-specific new sensors; provide systematic data archiving, dissemination and visualization capabilities; facilitate community access to data; promote multidisciplinary research and educations; and provide a forum for policy discussions.

The *intellectual merits* of ARCHER include the use of a subset of its data to address certain cross-disciplinary issues in hydrometeorology, which include pathways of salts (which are known to accumulate in the proposed domain), water budget and evaporation (in arid regions > 90% of water entering urban systems do not exit as surface or groundwater flow!), episodic sediment transports (flood events) and plume dispersion (fire-induced). The project will develop novel concepts, techniques and algorithms for linking individual sensors or networks to a central computer system, optimal siting of sensors, coordination across different networks, adaptive data acquisition, streaming, validation and storage, integration of heterogeneous information from different sensors, on-demand data retrieval, automated event identification based on scientific criteria and sensor-model fusion. The proposal also melds the technical expertise of a group of information scientists, environmental engineers and atmospheric scientists to create a versatile sensor network that identifies critical environmental issues and provide extensive data and modeling support to address them.

The *broad impacts* include the development of a prototypal metaphor and a test case for future earth observatories, which has become a U.S.-led international priority following the declarations of the Earth Observations Summit, Brussels (February 16, 2005). The remotely accessible data bases of ARCHER, available in a unified format with metadata, will be a major resource for interdisciplinary

environmental research and education. On the local level, several environmental agencies will use ARCHER data and manipulation tools for water and airshed management as well as a policy platform on which of multiple sources of information and scenarios can be scrutinized. Advancements of enabling technologies for environmental sensor networks and training of a breed of diverse graduate students with strong multidisciplinary skills in environmental sensor network development and applications will be an integral part of the project. The project also entails research experience for undergraduates, recruitment of minority and underrepresented groups through coordinated outreach activities to partake in research and education, high-school student involvement in setting up and operation of data towers for class science projects, continuing education for K-12 teachers through summer projects, lectures and curriculum development activities, and public outreach through a website containing data and project information that will trigger environmental stewardship, policy debates and awareness of environmental challenges faced by the society.