General Project Information

- Project ID:
 GLRI_00E00459-0

 Name:
 Expanded Beach "Nowcast" Modeling across WI
- Type: Great Lakes Restoration Initiative
- Subtype: Nearshore Health and NPS
- Status: COMPLETE
- Start Date: 10/1/2010
- End Date: 9/30/2013
- Purpose: The proposed project will significantly expand operational nowcasting of beach water quality in Wisconsin by building multivariate models for high priority and impaired beaches using EPAs Virtual Beach 2.0. In addition, we will test a complimentary system developed by USGS and a hybrid qPCR/multivariate model. We will provide hands-on training and technical assistance to beach managers to build long-term, local capacity to operate and refine the models, and will provide user-feedback to EPA and USGS to further enhance the tools and lower barriers to their use throughout the Great Lakes.
- **Objective:** To reduce the number of Type I and Type II monitoring errors and the overall number of beach closures in Wisconsin the proposed project will establish a three-year project position within the WDNR Bureau of Science Services to facilitate a significant expansion of operational nowcast modeling across the state. The goal is to establish 20 operational nowcast models by the summer of 2013, including 10 or more high priority beaches. Major project tasks will include building initial nowcast models for candidate beaches using modeling tools and database systems developed by EPA and USGS; developing, testing, and refining step-by-step nowcast training modules; conducting 5 hands-on training workshops; providing technical assistance to beach managers and monitoring personnel engaged in operating, evaluating, or refining nowcast models; compiling and providing user-feedback and practical suggestions to EPA and USGS; and helping to coordinate complimentary tool development and database integration efforts led by EPA, USGS, and others.

Version 2.0 of EPAs nowcasting software Virtual Beach (scheduled for release in spring 2010) will be used to build multivariate predictive models for 27 high priority beaches across Wisconsin, plus 25 additional beaches that are included or proposed for inclusion on the states 303(d) Impaired Waters list (see Table 1 and attached Project Map). Of the 52 candidate beaches, 41 have adequate data for building nowcast models; i.e. 120+ contemporaneous observations of the response variable, E. coli, and multiple explanatory variables (e.g., wave height, turbidity, antecedent rainfall) collected during routine sanitary surveys or via USGS an NOAA hydro-meteorological stations (Francy and Darner 2006; Mednick 2009). The remaining 11 beaches will have adequate data by 2011 under separate GLRI proposals submitted by project collaborators at the University of Wisconsin (UW)-Oshkosh and Racine Health Department (HD), titled Comprehensive Sanitary Survey Project for High Risk Wisconsin Beaches Northern Wisconsin and Comprehensive Sanitary Survey Project for High Risk Wisconsin.

During the summer of 2010 WDNR will complete work underway to assemble a master database for the 52 candidate beaches comprised of historic (ca. 2003-2010) E. coli monitoring results and contemporaneous data on beach conditions collected via routine sanitary surveys, as well hydro-meteorological data from NOAA and USGS automated observing stations and NWS Cooperative Observer Program weather stations; i.e., antecedent rainfall, air temperature, wind speed and direction, cloud cover, stream flow, lake level. This work will be conducted in collaboration with the USGS Wisconsin Water Science (WWSC), which is assembling similar databases for selected beaches under the federal GLRI project titled: Beach Health Nearshore Water Quality and Beach Closures, and will be guided by a comprehensive inventory of publically-accessible data for nowcasting conducted by WDNR (Mednick 2010). Continuous and categorical time variables (e.g., Julian date and season) will be included in order to account for potential inter- and intra-seasonal variation in FIB concentrations not explained by other variables (Mednick et al. 2009).

Comments: \$249,998

Wisconsin Department of Natural Resources SWIMS Project Summary

Outcome: The proposed project addresses Nearshore Health and NPS Pollution Goal #4 (High quality bathing beach opportunities) in the draft Great Lakes Restoration Initiative Action Plan for FY2010-2014. Specifically, the project will help to achieve the objective of rapid testing or predictive modeling at 33% of high priority beaches by 2014, by instituting nowcast models at 10 (37%) of the 27 high priority beaches in Wisconsin, and a combined 20 (37%) of the 54 high priority and/or 303(d) impaired beaches in the state by 2013. The project directly responds to the Great Lakes Regional Collaboration Strategys call for state, federal, local, and tribal partners to create and improve predictive models in conjunction with sanitary surveys. Disseminating information and training tools on predictive modeling is part of both the Lake Michigan and Lake Superior LaMPs. Enhancing predictive models, model scope, and application is a goal of the interagency Ocean Research Priorities Plan - Great Lakes. Field-testing and the development of user guidelines for Virtual Beach is part of EPAs Critical Path Science Plan. Lastly, the project will help to meet the goal of the Wisconsin Great Lakes Strategy goal of reducing closure dates at high priority beaches by 10% from base year 2006. The baseline accuracy assessment described under Project Background (Section 8) and numerous beach-specific studies (previously cited) strongly suggest that nowcast modeling will result in an overall reduction in beach closures.

Study Design:

QA Measures:

People

Name	Role	Status	Start Date	End Date	Organization	Comments
DINSMORE, DONALEA	COORDINATOR	ACTIVE	12/20/2010		Wisconsin DNR	
MEDNICK, ADAM C	PROJECT_LEA D	ACTIVE	10/1/2010	12/31/2099	Wisconsin DNR	

Project Statuses

Date	Reported By	Status	Comments
1/19/2011	DONALEA DINSMORE	Progress: 0-25% Complete	Approved QAPP submitted

Project Status Detail

Answer Set: DEFAU	LT						
Question			Answer				
1. Reporting Timefran	1. Reporting Timeframe (Q1) (Q2) (Q3) (Q4):						
2. Amount expended	2. Amount expended this reporting period:						
3. Subcontracts or sul	bgrants awarded th	nis reporting period:					
4. QAPP (Project Plar	n) status:						
5. Local services and/	5. Local services and/or products purchased this reporting period:						
6. Number of jobs cre	ated this reporting	period:					
7. Work accomplished	d this reporting peri	iod:					
8. Work goals for com	ning reporting perio	d:					
1. Reporting Timefran Sept):	ne Month/Year to N	/onth/Year (Oct-Mar or Apr-					
2. Quality Documenta	tion status (respon	d NA if not required):					
3. Describe work perfective activities from the	ormed during this r grant workplan (Pi	reporting period relating to revious 6 months):					
4. GLRI Action Plan m during this reporting p	netric(s) accomplis period:	hed and numerical progress					
5. GLRI Action Plan m since project start (tot	netric(s) accomplis al complete to date	hed and numerical progress e):					
6. Percentage (estimative reporting period:	ate) of project work	completed during this					
7. Percentage (estima start (total complete to	ate) of project work o date):	completed since the project					
8. Is project work on s	chedule? If no, ple	ease explain.					
9. If a problem was er taken to correct it.	ncountered, describ	be the problem and action(s)					
10. What work is proje months):	ected during the ne	ext reporting period? (Next 6					
11. Will the project tak so, have you requeste coordinator?	ke longer than the a ed an extension in	approved project period? If writing to the grant					
12. Amount expended no amount expended,	this reporting peri explain why.	od (can be approximate) If					
13. Is project invoicing than 3 months overdu	g/expenditures up t ie, explain why.	to date? If invoicing is more					
14. Were any signification made to the project be coordinator in writing?	ant changes (>10% udget? If so, have y	of the total project amount) you notified the grant					
Actions							
Action		Detailed Description		Start Date	End Date	Status	
Information and Educati	on	Expand operational nowcast water quality Lakes Michigan	ing of beach and Superior	10/1/2010	12/31/2099	PROPOSED	
Monitoring Stations				•			
				-			
Station ID	Name			Comments			

Assessment Units

Wisconsin Department of Natural Resources SWIMS Project Summary

WBIC	Seg	ment	ent Local Name		Official Name					
Lab Account C	odes									
Account Code Description								Start Date	End Date	
Forms										
Form Code Form Name										
Methods										
Method Code		Meth	od Description							
Fieldwork Even	nts									
Start Date	Status		Field ID	Sta	tion ID	Statio	on Name			
Documents										
Title	Description		Author		Published	Comme	nts			
Beach Nowcast Q/ Appendix 2	Beach Nowcast QAPP Appendix 2 to approved QAPP - Appendix 2 Sanitary Survey		PP -	Adam Mednick		1/19/2011				
Nowcast Modeling Proposal, Mednick	g GLRI				Mednick, Adam		1/28/2011			
Semi-Annual Gran 9/10-4/11	it Report	GLRI g	rant progress		Adam Mednick		5/15/2011			
Semi-Annual Repo 10/11	ort 5/11-	Grant r	report to EPA		Adam Mednick		11/15/2011			
WI Nowcast QAPF 1	9 Append	ix Appen Monito	dix to final QAPP - Bea oring QAPP	ach	Adam Mednick		1/19/2011			
WI Nowcast QAPP Approval Page NAME: Expanded Beach "Now Modeling across WI		OJECT wcast"	Adam Mednick		1/19/2011					
Wi Nowcast QAPP)	Final A	pproved QAPP		Adam Mednick		1/19/2011			
Workshop Travel I	Report	Summa Worksl	ary report of Beach M hop in Columbus, OH	odeling 12/5-7/11	Adam Mednick		12/14/2011			
Budget										

Wisconsin Department of Natural Resources SWIMS Project Summary

Budget Descr	iption: Budget for Expanded Beach WI	"Nowcast" Modeling across	Start Date:	10/1/2010	End Date:	9/30/2013
Code	Description	Quantity Units	Unit Cost	Total Cost Com	ments	
FTE	FTE Hours	Hours	\$0.00	\$0.00		
LTE SAL	LTE Salary	Hours	\$13.00	\$0.00		
LTE FR	LTE Fringe			\$0.00		
LTE IND	LTE Indirect			\$0.00		
LTE TOT	LTE Total Cost			\$0.00		
SUPPLY	Supplies			\$0.00		
MILEAGE	Mileage	Miles	\$0.72	\$0.00		
MEAL	Meals	Meals	\$9.00	\$0.00		
LODGE	Lodging			\$0.00		
TRAVEL	Travel Total			\$0.00		
BUG	Bug Contracts			\$0.00		
OTHER	Other Contracts			\$0.00		
EQUIP	Equipment			\$0.00		
USGS	USGS Costs			\$0.00		
TOTAL	Total Cost (excludes SLOH)			\$0.00		

Total WSLH Lab Costs:	\$0.00
Total Budget:	\$0.00
Combined Budgets:	\$0.00
Combined WSLH:	\$0.00
Combined Total:	\$0.00

Funding

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Organization	Source	Туре	Amount	Start Date	End Date