

NPS-USGS Water
Quality
Partnership
Program

2019

Work Group
Comments –
Proposals for
New Projects
Commencing
FY2019

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The effects of water quantity on water quality: implications for current and future distribution and population sustainability of the Federally endangered dwarf wedgemussel in the Upper Delaware Scenic and Recreational River

CATEGORY: Intensive

PARK: (UPDE, DEWA, LODE)

USGS West Virginia – Leetown Science Center

Comments:

This proposal's water quality aspect is quite limited. Only one of the four project objectives is oriented on water quality. Overall the projects seems to be focused on the presence/absence of water and the timing of these phases with only a secondary focus on water quality.

Much of the success of the overall project and its ability to be completed in the proposed time appears to hinge on the successful hiring, training, and success of a graduate student to develop the model and prepare statistical analyses. How much oversight/assistance will this student have by professionals who have developed and analyzed hydrologic models in the past?

Transferability appears limited by focusing the model on the tendencies of a specific species.

Given the location, importance of the resource, the scale and scope of basin stakeholders, this project seems to have a higher potential for in-kind support than what is described here.

6-month cage studies are planned. This is an intriguing component of the study. Are staff with adequate expertise available for: O&M on the temperature and DO loggers (up to 2-year deployment); and installation and maintenance of pressure transducers & developing rating curves (low-flow end is more important than higher flows). Will these data be available through NWIS? The proposal briefly mentions TM 1-D3, but no Water Science Center staff appear to be involved. It isn't reasonable to expect the sensors to maintain themselves that long without regular servicing visits, and data should be downloaded frequently, not just in the fall of 2022, as stated in the timeline.

The proposal outlines the problem well but doesn't address why existing information is not adequate: It mentions that DWM have been studied at UPDE for upward of 20 years but then says surveys haven't been conducted since the early 2000s- Why is that the case? Has the 20 years of research focused on a different problem? Has that problem been resolved and what has it told us that is informing this problem?

Discussion of methods/protocols confusing. Not sure if you are developing new survey methods or using existing. It is unclear whether your methods would yield data that is comparable to other studies or specific to this study only.

While the proposal says this is the top natural resource priority, it did not explicitly outline 4 of the 6 required criteria.

<p>There is too much unknown to fully estimate the urgency of the problem. There is no lost partnership or cost sharing opportunity if delayed.</p>
<p>It is unclear how the study could be applied to other watersheds that do not have a REFDS in place. Is the REFDS applicable to other sites or is it site specific?</p>
<p>More details of how the project results will be utilized is needed. How likely is it for the results of this study to result in changes to the FFMP, i.e. with so many people involved, is change slow and requires multiple studies to result in change? How much control does UPDE have on FFMP? Articulating exactly how this information would be used, i.e. exact next steps instead of broad statements, is needed.</p>
<p>Park's highest priority issue is achieving flow regimes and water quantity/quality that supports ecological integrity. Flows in the Delaware River are heavily managed. Dewatering events are unsuitable for the dwarf wedgemussel (through desiccation or water quality impacts).</p>
<p>Relates to enabling legislation; Outstandingly Remarkable Values. Lots of competing uses for water in this system--drinking water, fishing, boating, swimming, and rare, endangered, and migratory spp.</p>
<p>Overall this seems like a major concern of the park, but reading of the proposal is this is more about water quantity than water quality.</p>

Development of an Interactive GIS-Based Management Tool to Support a Spill Preparedness Plan and the Design of a Water-Quality Monitoring Network to Assess Current Water-Quality Conditions Within, and Adjacent to Theodore Roosevelt National Park, North Dakota

CATEGORY: Intensive

PARK: Theodore Roosevelt National Park (THRO)

USGS Dakota Water Science Center

Comments:

Regarding database development, there should be more detail on how input parameters are weighted and interact with one another. A spill event in and of itself does not pose an immediate threat to water resources. Factors such as contaminant type and volume, persistence until discovery, proximity to surface water, permeability of substrate, etc. all play large roles. These elements may be part of the tool development, but if so they are poorly elaborated on in the proposal.

Why are springs and seeps considered surface water?

In ground-truthing, an approach including artificial tracers in a "mock spill" would be a valuable assessment of the value of the tools being proposed.

The budget is thin on detail. Estimated number of samples, types of analyses, etc. would be helpful.

In the project description or evaluation of significance/severity, it would be useful to elaborate on the known water quality impairments that resulted from the 500,000+ gallon spill directly into a tributary of the Little Missouri. Gives a frame of reference.

Why is the current water quality monitoring and the water quality sampling that has been conducted for the last 50 years, not allowed the park to characterize the baseline water quality? A better explanation of why that data is inadequate is needed. Also how is that data informing your study design?

It is unclear how urgent this issue is if this need was identified 20 years ago and not addressed yet. Among the top 5 priorities for park, however only lists 3 of the 6 required criteria for significance. Would data from one of the past spills help to ground truth the model? Is there any data on one of the many previous spills?

There is no lost partnership or cost sharing opportunity if delayed.

Seems like it would be helpful to include location of sensitive resources so that managers can determine if there is a high risk associated with a given spill event and/ or areas that might create a high risk event to aim for protection of those areas.

Will the GIS tool need to be updated/ maintained and if so, who will be in charge of doing that? Is it possible that as new data is collected, if it is not put into the tool, the tool will become out of date?

Good problem description. Critical timing for obtaining baseline data, given that O&G development is ongoing. Detailed approach and timeline were provided. Staff have the necessary expertise. Builds on a strong foundation of previous projects, including a groundwater flow model.

Would be nice to include an estimate of time of travel in the tool.

Would also be nice to add an assessment of benthic macroinvertebrates and fish community structure in the tributaries. Anytime you are establishing a baseline, this information is invaluable. This would be beyond the funding cap for this call, but perhaps the NPS could seek funding elsewhere.

Well thought out proposal taking advantage of existing work in the area and will build and use this work to the studies advantage. The development of the GIS-based management tool will be applicable at many parks concerned with spill response, any type of spill. Concerns that the flow path determination will be difficult. Without knowing much about the model just developed is the cell size too coarse to be used at the THRO scale?

USGS/National Park Service Water Quality Partnership Developing tools to determine causes and toxicity of cyanobacterial blooms in the St. Croix National Scenic Riverway (SACN)

CATEGORY: Intensive

PARK: St. Croix National Scenic Riverway (SACN)

USGS Upper Midwest Water Science Center

Comments:

Methodology, sample decision tree, project timeline, and project budget all well-constructed and assist in the presentation of the entire project.
A description of how crowdsourced data will be verified and QA/QC'd would be beneficial.
Does the CE-QUAL-W2 model current predict cyanobacteria blooms and the proposed research would just enhance or increase the accuracy?
The second objective is linking water quality parameters to bloom occurrence. Is there any "proof of concept" that might indicate this will work?
The end result will be a better understanding of the mechanisms behind HAB events for an early warning system, will NPS or USGS do anything with the information to help prevent HABs?
It would have been nice to hear more about the lessons learned and end result of the previous USGS/NPS partnership project. How does that project relate to this project? Also how has the previous NPS sampling and AlgaeNet sampling data informed the development of this proposal?
Why only 3 samples during bloom? How will precipitation events play in to deciding when to sample? Significance includes: top priority, subject of enabling legislation, fundamental to park's purpose, federal or state lists as endangered.
Problem is urgent and potential public health or safety threat exists but there is no lost partnership opportunity if delayed. Ongoing problem that has not yet been addressed.
It is unclear how the information would be transferrable: would another park have to undergo the same 3 years' worth of field data collection and model development or will the results indicate what parameters can predict these blooms and the other park would just need to start measuring those parameters?
WQ sampling: add secchi or other measures of clarity/light penetration. Vertical profiles throughout water column? Zooplankton? At what depth will lake samples be drawn (the phytoplankton vertically stratify)? Proposal indicates samples will be drawn from the mixed layer. How many sites and approximately where are they located? Need details to evaluate the budget.
Two continuous WQ monitors will bracket the reach--are these riverine sites? The chlorophyll and phycocyanin data may not be as useful at riverine locations. Another monitor will be placed in the bloom-prone pool. This may be the only one needed, particularly for the pigments.

Can a 2-D model effectively model a 3-D problem? Although the model "could" be used to provide early warning, someone would have to be responsible for running it and disseminating the output in near real time. Would strengthen the proposal if there was a plan for that type of dissemination; otherwise, the model may sit on the shelf.

Budget is detailed and generally realistic, but who is running those 3 QW monitors and working the records? Could eliminate and/or reduce parameters at the Stillwater and Prescott locations.

The concept of updating/modifying the existing model is great idea to try and can provide valuable information to the park. If this approach works, other parks could develop similar models for predictive purposes. Taking advantage of the recent model development is key and delaying such a study may require additional model work that could potentially make this project much more costly.

Nutrient status of the Upper Skagit River prior to FERC hydropower relicensing

CATEGORY: Intensive

PARK: North Cascades National Park (NOCA)

USGS Washington Water Science Center

Comments:

How will the final evaluation for licensing investigations be hindered without a nutrient model? Need to better justify why the currently proposed approach is sufficient to meet these needs.
Proposal states sampling locations will be "funding dependent". Does the proposal budget account for the number of sites or not?
The proposal does not include how the data will be analyzed/ statistical analysis. The concern is that if your sampling is "spaced to capture the expected variability" will the variability be too high to make a comparison of upstream/ downstream. Will you have enough statistical power to tease out influence of the dam?
There is ambiguous language in the ranking criteria of whether temperature and nutrient modeling will be done or not.
The park boundary should be added to Figure 1.
There are a couple of typos in the intro material of the proposal.
While the problem is clearly defined, the proposal leaves me wondering what existing data there is and why it is not adequate. NOCA does not currently monitor nutrients- what does it monitor? How has that data informed this proposal? The proposal mentions that Temp and Nutrients have been implicated as depressed- based on what?
How long is the new license for? If you miss this window to make changes, when would the next window be?
Would like to have seen a more well thought out sampling design described with locations already pre-selected and what gages are to be installed instead of saying "will be considered" or "installed where practical."
Unclear how this would be transferable. Data will be shared but no specifics on how it would contribute to tangible needs elsewhere.
Cost Effectiveness: Seems like a lot of money for a project that is aimed at just providing "baseline" information. Could this not be scaled down to a technical assistance?
Proposal mentions some possible remedy ideas but does not go into enough detail to understand what they would involve or how the project would determine which is best.
Enhanced scientific merit from the use of nutrient diffusing substrates to measure chlorophyll <i>a</i> and measurements of macroinvertebrate drift.

Good timeline and detailed budget. Additional salary might be needed, especially for startup in FY2019. There are some existing gages on tributaries that might be usable, which would reduce time and costs. Biologist's hours appear insufficient for identifying, counting, and measuring macroinvertebrate samples.

Was left wondering what the park can do with the information. Providing information for the FERC licensing is key but is that what the partnership is about? Temperature is always an issue to streams and with bottom release dams even more so.

Inform drought preparedness in Mount Rainier National Park with high-resolution information on water quality and availability

CATEGORY: Intensive

PARK: Mount Rainier National Park (MORA)

USGS Forest and Rangeland Ecosystem Science Center

Comments:

<p>A reasonable approach is presented, but the data informing the analysis appears to lack in both density and quality. Terms in the proposal such as "less intensive monitoring" and "limited discrete field measurements" do not seem congruent with the Intensive proposal category. For example, low resolution/high error discharge methods will not result in a robust dataset for statistical analysis. The same seems true of two years of temperature data collection. It would seem that this proposal should ideally be submitted at the culmination of a multi-year effort summarizing water temperature, flow, trends in dewatered reaches, etc.</p>
<p>The last two objectives in the Project Timeline occur after the period of funding. How will these be achieved if support is not available?</p>
<p>Data QA/QC documentation is lacking.</p>
<p>Why is the current data not sufficient? Proposal mentions that NPS does limited monitoring of temp and flow permanence- more information about this data and how that data informed the development of this proposal is needed.</p>
<p>While the proposal indicated it was a top priority for water quality and aquatic ecosystems, it did not indicate how this resource is significant outside of the impacts to ESA biota.</p>
<p>Mention of using visitors/ volunteers to generate data, i.e. citizen scientist, will they be trained and how will data be quality assured?</p>
<p>Where will the data reside? Will this data be stored in NWIS? How will the continuous data be worked, will Wagner and others (2006) be used? ScienceBase is not an archive, NWIS is the USGS archive.</p>
<p>Proposal mentions methods that were previously developed and validated, how does the methods that this project intends to develop differ from the previous one?</p>
<p>It is unclear how transferable this project will be. Can the methods be used elsewhere but still involve intensive sampling to develop useful models or will the information allow other locations to extrapolate temperature/ flow permanence from the relationships developed by this project?</p>
<p>No description of alternatives ways to do project that might have been explored. What are some of the other stakeholders other than NPS that will be engaged? Does NPS intend on implementing the decisions made during the workshop?</p>
<p>What was the reason for the current facility closures?</p>
<p>There is a large focus in the proposal on water supply issues. Is the driving factors water supply or aquatic ecosystems/ habitat issues?</p>

FRESC budget includes equipment and supplies. Budgeted time seems very low. Very little salary time in FY2019--is this sufficient?

Could the GIS layers be developed into an interactive decision-support tool? What's the sustainability of the product after the workshop?

Water temperature in the pacific northwest is a major concern and this project seems to be able to provide much needed information to the park as well as local stakeholders. Temperature is a concern at many parks and this project can be used to guide other parks with a water temperature concern.

Application of Hydroacoustics to Provide Continuous Real-Time Information on Metallic Contaminants in the Clark Fork during Superfund Remediation Activities at the Grant-Kohrs Ranch National Historic Site near Deer Lodge, Montana

CATEGORY: Intensive

PARK: Grant-Kohrs Ranch National Historic Site (GRKO)

USGS Wyoming-Montana Water Science Center

Comments:

A better explanation of exactly <u>why</u> real-time metals concentrations are imperative (rather than simply good and interesting science) to the remedial effort.
While it is mentioned that total metal concentrations are orders of magnitude higher than dissolved metals, are the dissolved concentrations at levels prohibitive of aquatic life or in exceedance of any set standard? What is the potential that remedial activities may increase this component and will not be captured by the proposal, or are these data being collected by the periodic LTMN sampling?
One of the justifications for using acoustic technology is the ability to read at turbidity levels exceeding 20,000 mg/L SSC. Are levels in this range actually anticipated to occur during remediation efforts? If so, this has large contaminant transport implications and the remedial approach may need to be readdressed.
Will the monitoring sites be able to be fully powered by solar? Are their contingencies for backup during cloud/snow cover so data are not lost?
Understand the need to protect the equipment from damage, but feel that having to limit data collection to the April-October window reduces the effectiveness of total data collection and perhaps the optimization of the regression relations that are developed.
While the issue is important, the proposal only mentioned 1 maybe 2 of the 6 criteria.
It is unclear how urgent the monitoring is since this is an ongoing problem. Assume the remediation is taking place during the sample period and so there would be a lost opportunity if not funded this cycle.
The proposal is well thought out with a lot of details regarding methods and statistics and permits needed.
Is the relationship between SCC and MCC site specific such that this method would not be transferable? If the relationship between the acoustic and MCC is based on site specific data could it not be applied at different sites?
What will NPS do with the data once the method has been determined? When is the remediation set to take place and what alternatives are there if the concentration spikes? What management actions will the proposed data collection resolve or help decide? More discussion of the potential use of the data would have been nice.

This is a very well written, well thought out, and detailed proposal. Excellent, detailed, realistic budget and timeline were included. Very high likelihood of success and project completion.

Would it be advantageous to include DO sensors to help interpret diurnal trends in MCCs, if observed? Or are temperature and pH sufficient to do so?

A good project design using appropriate methods. Like the combining of the turbidity with the acoustics. Each has its limitations but used together can likely complement each other and produce the results the park will need. The movement of metals through the system impacts many facets of the park. Using real-time surrogates can fill gaps on daily fluctuations and loads of metals through the system. Which provide valuable data to the Park that would be missed by discrete sampling.

Investigation of the vulnerability of water resources at Chaco Culture National Historical Park related to threats from oil and natural gas drilling

CATEGORY: Intensive

PARK: Chaco Culture National Historical Park (CHCU)

USGS New Mexico Water Science Center

Comments:

Given the age and condition of the existing supply well, a useful conclusion for the park would include an assessment of what would be necessary to target a new well should the existing one fail. For example, what is the feasibility of an even deeper well completed below zones of oil and gas interest?
Is there a benefit to adding Sr isotopic ratio sampling from the park well and pertinent geologic units in the San Juan Basin? Could be a useful tool in evaluating groundwater pathways.
In the proposal it would be beneficial to mention that because of the geomorphology of the SJ basin, the deep wells in the Chaco area are under significant hydrostatic pressure and are artesian at the wellhead.
While the resource is obviously significant as a drinking water source, the proposal did not address the 6 criteria for significance and as such did not meet 4 criteria to receive a 5.
Proposal should emphasize the loss of partnership opportunity by not doing the project now- aren't others involved with the modeling effort? With that said, there is a potential for human health hazard and doing the project now will prevent more expensive problems later.
What water quality parameters will be measured and why?
It is stated that deeper water is too poor quality; is this known or simply a presumption? Deep wells in the Morrison and Entrada are known to produce water of reasonable quality. This knowledge would be very useful to park management.
It is unclear how transferable this research will be outside of the San Juan basin given the unique nature of it.
The proposal makes the case that this information is needed to protect water resources but does not go into how this information will be used to protect those resources. Does NPS have the power to restrict oil and gas development around their land? What management actions will be taken as a result of this information? This project will clarify a management issue but will not fully resolve it.
Salary from the Utah and Arizona WSC provides \$197,000 of "support." This seems inflated, although it is a definite advantage to tie-in with their San Juan Basin model.
Why the problem is defined and clear, I am left wondering if the task is achievable? It is uncertain if there are enough wells within the formation to achieve the tasks, specifically the gradients and flow. The objective of defining the baseline water quality for the basin seems reasonable, but if the concern is the "sole source" aquifer then targeting work in the specific aquifer would be appropriate. A

conceptual model of the region is probably needed and good, but not sure how the park will really use that in resource management decisions.

Spatial and Temporal Distribution of Fecal Indicators and Microbial Source Tracking Markers Within the Buffalo National River, Arkansas

CATEGORY: Intensive

PARK: Buffalo National River (BUFF)

USGS Lower Mississippi Gulf Water Science Center

Comments:

<p>Methods should include a discussion of the field water sampling protocol/methodology rather than pointing to the USGS field manual. May have implications on QC of data, technical feasibility, etc. Sample equipment, filtering, preservation, EWI vs. grab, etc.</p>
<p>Given the high laboratory costs, could this proposed project be completed within the stated budget limits by removing a sample site or two without limiting the technical merit of the project as a whole?</p>
<p>When sampling a reach that is known to be gaining, will there be any attempt (or possibility) to separate what component of the sample is local groundwater inflow vs. surface flow from upstream?</p>
<p>Proposal lists "available data" that exceeds certain standards, more information about this data would be helpful to understand the problem context. How much data, what years, is this one sampling event or multiple, etc.? Mention of data from 2012 -2016, why did the data collection stop? It mentions in problem resolution section that the results will be used to refine ongoing monitoring- what is the ongoing monitoring and how has the information informed this proposal?</p>
<p>There is no context/ background provided for the "nutrient contamination" that is mentioned as part of the purpose.</p>
<p>It is a top "water resource issue" but unclear whether it is the top natural resource priority. Does not meet 4 of the 6 criteria.</p>
<p>It is unclear why this is more urgent now than last year or why it would be more urgent this year over next year. No lost partnership opportunity. Delay will result in continued resource degradation but not one that is likely irreversible.</p>
<p>It is unclear the importance of nutrient attenuation and the use of isotope of nitrate to determine denitrification. Proposal mentions 5 mainstream sampling sites of historically high bacteria concentrations- why do sites upstream of problematic tributaries have high bacteria? Why no isotope samples during high flow? Will there be a minimum discharge / precipitation requirement for the high flow sample or will the aim be to capture a variety of flow conditions?</p>
<p>I would assume results could be utilized outside of NPS and outside of the region. No mention of this however.</p>
<p>Proposal specifically says "Management actions are limited"</p>
<p>"Combining concentrations results from MST analyses with the flow measurement data will allow for the calculation of loads of the different source-specific MST markers." Proposal contains few details about HOW this will be accomplished. 14 MST samples (7 per year) will support computation of</p>

instantaneous loads for sampling events, but may not be sufficient for computing annual or seasonal loads. Do think the study would help identify the potential contaminant sources.

Doing MST in this karst terrain is intriguing.

There's certainly transferability to local and state stakeholders.

Like the concept of the project and with the state developing and action committee for the River system, this should go a long way to getting achievable results. It seems some of the park or impacts to the park are outside the parks control and implementation of practices could be difficult. However the Action Committee should help with the implementation. Like the MST part but have some concerns if sources are really going to be able to be determined. It is acknowledged swine is difficult in the proposal. Is there a way to get more volunteer or committees to help with some of the data collection to increase the cost effectiveness?

Major flood event and effects on hydrology, water quality, ecosystem health and coastal preservation efforts of tidal baldcypress swamps across the Northern Gulf Coast

CATEGORY: Intensive

PARK: Big Thicket National Preserve (BITH)

USGS Wetland and Aquatic Research Center

Comments:

There are several formatting errors in the proposal and ranking criteria.
If the salinity problem is at its worst when drought conditions are present, the likelihood for other basin entities to have the ability/desire to produce "freshening" flows seems remote.
The timeline entries include a line for "stat analysis" but there is no description of the proposed approach in the text.
The topic of salinity being sourced from activities beyond sea water intrusion (oil and gas in particular) is not mentioned until quite late in the proposal, and though it is stated that these sources could somehow be able to differentiate these sources, there is no mention in the methodology or analysis of how this would be achieved.
The proposal outlines the problem well but doesn't address why existing information is not adequate: what data has been collected since Harvey and how has that data informed this proposal. Is this just continuing that data collection for this project (due to loss of funding to continue) or making changes to the protocols based on what you have learned?
Proposal did not mention any of the 6 criteria for significance.
Not doing the project this year will result in a lost opportunity due to the nature of the project being tied to Hurricane Harvey last year.
It is unclear how the project will determine the amount and frequency of water that may need to be released since it is studying just one event. Would artificial releases be a possibility to determine this information and test different hypotheses?
No mention of other who have expressed interest in the project but the information will contribute to the tangible needs of others at the national level.
The use of students and volunteers reduces costs but there is no mention of alternative methods that were explored.
The research concept is good but the proposal doesn't fully articulate the information based on the criteria for evaluation. A better written proposal would have received better scores.
Technically strong.
Results could be widely transferable and useful; however, the proposal would have been strengthened by describing how the PIs would actively work with the NPS and help them use the findings to address specific management issues at Big Thicket.

Budget was difficult to decipher. What does the "Subcontracts" category cover--Univ. of FL PI and graduate assistant?

Overall the problem is defined, and this is about quantity of freshwater available to the park, and is reflected in the scientific merit. How much existing data is there pre-hurricane to ascertain the effects of drought and it is now almost a year past Harvey, is the moment in time gone? How much effect is Harvey still having on the system?

Beavers impacting tundra ecosystems: Quantifying effects on hydrology, permafrost, water quality, and fish habitat in Alaska's arctic national parks

CATEGORY: Intensive

PARK: BELA, CAKR, GAAR, KOVA, NOAT

USGS Alaska Science Center

Comments:

Why use the Boulder lab for analysis? Cost? Is this low ionic strength water? I am thinking this project would be better as a synoptic type study up front to gather the initial data to assess the potential negative impacts of the beaver dams.
Interesting application of this research to a distinctly non-standard ecosystem/environment. Appears to be on the leading edge of an issue a much larger area may be experiencing in the future.
This proposal describes what appears to be a massive amount of data collection. Have the PIs thoughtfully determined their ability to synthesize, QA/QC, analyze, and compare all of these data within the study period? Great budget detail, but should summarize the three-year total at the end.
What data has I&M currently collected and how has that data informed this proposal?
Proposal doesn't address any of the criteria for significance. Issues is "of concern" to NPS but not a priority natural resource issue.
How rapid is the rate of range expansion?
Is it necessary to map ALL beaver dams? Could this study be pared down to something smaller and focused on a few beaver dams and still provide useful information?
Calculated 43% of costs in kind. Would be nice to see total cost for the entire project instead of only split by year.
Fascinating! Like the interdisciplinary aspects of this proposal and the mix of well-qualified investigators. High amount of leveraged support.
Continuous records of stage and temperature are planned upstream and downstream of beaver ponds, but the proposal doesn't state the number of locations (12 pressure transducers suggests 4 sets of sites in FY19, perhaps moving in FY20?). Rating curves will be developed. This would normally require many site visits during the short non-ice season, but it sounds like only 2 visits are planned (June and Aug/Sep). How many visits are budgeted?
Concerns about the data storage not being in NWIS. Calibrating the meters to manufacturer specs is ok, but checking regularly is not USGS policy; refer to the National Field Manual.
Good use of existing NPS Inventory and Monitoring Network data sets.
How will the continuous data be collected and stored? IS this to be in NWIS? Is it real time?

Assessing harmful algal blooms of Pseudo-nitzschia in coastal marine waters at Acadia National Park and the NPS potential role in mitigation through water quality control

CATEGORY: Intensive

PARK: Acadia National Park (ACAD)

USGS New England Water Science Center

Comments:

This is a good proposal using emerging technology and complex methodologies to provide valuable management/mitigation strategies to a newly-emergent issue. Well constructed.
Excellent use of partnerships and in-kind support to produce a cost-effective and comprehensive investigation, though proposal budget could provide more detail.
Proposal provides a good literature review of research that has already been done but doesn't explain how this work will be any better at determine resolution to the question of what causes the toxicity. Is it possible that DA won't be detected this year?
This proposal is about the waters off Acadia, so I am left wondering what the management impact of the park is. The threat is there and a problem exists, not sure how the park can use the information to manage the resource. It will be useful information for the park, but how will they use it? The use of the platform for the monitoring is innovative and provides valuable information and would have transferability to other environments such as parks with lakes.
No mention of loss of partnership opportunity if not done this year. Impacts it seem would not be irreversible but things might get worse if trend continues. It is unclear how fast the DA produced by the blooms is incorporated into shellfish.
It is unclear whether the information developed would apply to blooms outside the region or would be more site specific due to the many potential factors affecting DA production.
While the partnership and in-kind support from WHOI is tremendous, there is no discussion of potential alternative ways of collecting the information. Is real time data actually necessary?
It is unclear what management actions the park will or could take as a result of this information. Is most of it actually out of their control (upstream nutrient inputs)?
Scientifically interesting--Light, nutrients, physical parameters, toxic-producing dinoflagellates. Significant public health and economic risks from domoic acid; also to marine biota.
Good collaboration between USGS, WHOI, Florida Fish & Wildlife Research Institute (FWRI), and NPS. The technical merit of the monitoring is impressive, as is the list of investigators.
Water currents are likely very important to bloom movement/persistence, but are not mentioned except in passing. Is there an observing buoy nearby?
Weak on the data analysis portion-only multiple regression is mentioned.

An assessment of the scope of Giardia contamination and the effectiveness of protection strategies in surface waters at Acadia National Park

CATEGORY: Intensive

PARK: Acadia National Park (ACAD)

USGS New England Water Science Center

Comments:

How are field water quality parameters and precipitation/air temperature data going to be used to inform the study and/or evaluate the results? Data collection is mentioned but not elaborated on.
What do the different colors on the Activity Schedule represent?
Budget details are relatively thin.
Really like this proposal and the work seems appropriate with methods that can produce the results needed. The severity of the threat is real, but it seems like there has not been a lot of recent issues, but would like to see this work done as this an excellent place to start and has high probability of transferability to other parks.
The opening of the proposal should have briefly described the purpose of the research. After paragraph 1 was confused as to the sudden change of direction.
Confused as to whether human Giardia has actually been detected in drinking water supplies or if water supply companies are preemptively requesting management of wildlife populations associated with water sources. Are there current data available and how has the current data informed this proposal? This is a good project but the proposal did not rank high because the text did not address ranking criteria very well.
Proposal mentions that ACAD managers devote considerable amount of resources to manage problem- what are the currently doing that takes so much time?
Proposal does not address whether this is a priority natural resource issue. Merely says it significant because it is urgent. Resource is not one of a kind.
Sampling is comprehensive but it is unclear why so many samples are needed. Could a pilot project provide some useful information to inform future studies? Are the huge number of samples and some initial data/ information to show proof of concept?
No mention of other parks that would be interested in information. Is the only idea that would be transferable the fact that beavers are not causing human health concern or could the diagnostic methods be transferable?
No discussion of possible management alternatives.
Although there have been no substantiated human outbreaks on MDI, there's a danger of mis-managing wildlife (beavers) in an attempt to reduce the public's perceived risk of infection. Although interesting and scientifically worthy, there's not an overwhelmingly compelling need for this work.

(8 streams 4-5 X/year; 5 ponds 2X/year)*2 yrs. Spring and summer. 4 lake bed sediment samples. Given the low frequency, it will be difficult to achieve objective 4 (characterize high and low flow conditions)

Find it hard to believe that Giardia is "generally believed to be present". How is this not known concretely if the issue is as significant and severe as presented in the proposal?

Good timeline provided. Sampling regime is well described and doable. Few details on data-analysis approach or anticipated products. Budget appears adequate. Unclear if this will resolve the perceived problem.

Proposal does not mention potential partnership loss from data being collected during 2018.

Documenting the Acid-Base Status of the Meadow Run Watershed in SHEN

CATEGORY: Synoptic

PARK: Shenandoah National Park (SHEN)

USGS Virginia Water Science Center

Comments:

<p>What are the baseline pH and Al conditions in this watershed? What is the severity of the problem?</p> <p>Well defined problem and potential to establish a method for other parks dealing with acidification issues. Baseline data is always needed prior to any treatment or "fix" to a site. This data will also be necessary to confirm the acidification is a major threat to the park and will be needed to lime the park. Have no concerns that this project cannot meet its object and provide valuable information to SHEN.</p>
<p>The bedrock here appears to be the Cambrian Antietam Formation. Expand on its relation to water quality, high iron content (hematite/limonite) is known locally: is this a factor?</p>
<p>Is this study necessary for NEPA compliance to move forward with aerial liming? Will not having the test results preclude this from moving forward?</p>
<p>Determination of sampling locations not adequately discussed. Same with data QA/QC; more on quality control of sample collection rather than chain of custody procedures.</p>
<p>Why isn't precipitation (rate and chemistry) being included as a supplement to water quality sampling? This seems like an important element to the study.</p>
<p>Only Al, pH, ANC are expanded on, what are other parameters (SO4, NO3, Cl, etc) informing?</p>
<p>Data "can be used to determine the amount of lime that will need to be applied". How will this be done?</p>
<p>How many sites will be sampled? Is it correct that all sampling locations are outside of the park boundaries? Why not sample within park boundary? Quarterly samples- will they be done during baseflow or stormflow or randomly? What is "hire an expert funds"?</p>
<p>Why is the current stream sampling not sufficient? How has that data informed this proposal?</p>
<p>If liming occurs, this would be a significant project. Is there a possibility that liming would not occur?</p>
<p>This is a long term problem. Do the settlement funds expired if not used immediately? If acidic deposition has decreased, will delaying the project just result in slower recovery?</p>
<p>The methods are transferable but is the information produced useful to any other parks? No new methods will be developed by this project and so the methods are standard protocols</p>
<p>Will the project provide data to be used in the NEPA document or will the project provide the NEPA document?</p>
<p>It wouldn't be a bad idea to include titrated acidity.</p>
<p>Meadow Run appears to be called Riprap Hollow on the USGS topo maps, why is it Meadow Run here?</p>

Understanding the contaminants in Glorieta Creek and Pecos River related to wastewater treatment facilities near Pecos National Historical Park, New Mexico

CATEGORY: Synoptic

PARK: Pecos National Historical Park (PECO)

USGS New Mexico Water Science Center

Comments:

There is no mention of whether baseline or reference conditions exist on which to compare the results of this study. Paired watershed? Pecos River and Glorieta Creek above their respective WWTPs? If working with these entities to better handle their waste, this is important information to have.

In Conclusions, the fact that the results of this study may be used to assist WWTPs in improving their water quality is an important factor. This should be moved up to the beginning of the proposal and mentioned other times in the ranking criteria, as it would be a concrete water quality improvement result of the project.

It seems unlikely that the park wants the results of emerging contaminant data provided at the Visitor Center. Was this discussed with park personnel?

How many of these compounds of interest have action levels that could be used to encourage the WWTP operators to improve effluent quality?

If NMED is moving forward with a TMDL evaluation of Glorieta Creek, why can't this be leveraged into that process?

It is unclear how these compounds affect fish. Since the purpose talks about producing information for fish management plan, it would be good to connect the impact of CEC on fish communities.

"Water resources": while a #2 priority for the park, it is unclear what process made it a #2 priority (foundation workshop, GMP, personal communication) and it is not a unique feature.

It is unclear why nonregulated compounds are important for the TMDL process- if they are not regulated by EPA why would it matter that they are developing a TMDL next year?

It is unclear how this information might be used by other parks or other people. Description of how this project results would be utilized by others is needed.

Based on the proposal, the project will contribute basic information about a park natural resource issue. It is unclear exactly what management actions will be taken based on this information. A discussion of different potential alternatives would be useful.

Information on potential contaminants from 2 upstream WWTPs is needed to inform fish management plans and plans for expanded trail access. Straightforward and well-written proposal to fill a data gap that can inform park management plans, as well as activities conducted by State agencies.

Suggestion for modifying the sampling plan: with no sites located upstream from the WWTPs, it will be impossible to discern whether the WWTPs are the source of contaminants. If possible, add sites upstream from G-1 and P-1. Site G-2 could be dropped (as could P-2). The number of samples could be reduced if necessary, because funding will definitely be a constraint.
While artificial sweeteners and drugs of concern would certainly be interesting, it might be better to analyze for commonly used pharmaceuticals (NWQL). These are frequently detected downstream from WWTPs. Some are endocrine disruptors or biologically active in other ways, and should be of great interest to the park and the NM Dept. of Game and Fish. See from the budget that the OGRL offered a "deal" on their analyses.
A sound study design; like the concept of bringing the discrete, passive and active sampling together. This will provide valuable insight to contaminant transport and availability in the stream. With the southwest appearing to be drier and flow being comprised of a lot of WWTP effluent this is a study that needs to be undertaken. Studies have been done across the world documenting effluent dominant streams on aquatic life, but the sample design here will fill gaps that are likely when only using one sample method. Understanding what is happening in the park at this time is critical as it is likely if more areas of the park are opened to the public.
The NPS Southern Plains Network has water quality data from the Pecos River that would be of use to this study, but is not mentioned that it will be incorporated.
Why not sample upstream of WWTP? It is unclear how the sample will determine concentrations over different flow regimes- will sampling dates be based on trying to capture high flow and low flow? Or spaced evenly over the course of a year. It is unclear whether the focus is CEC or other water quality parameters and why both are being sampled?

National Park Service/USGS Water Quality Partnership Distribution and Occurrence of Cyanobacteria and Cyanotoxins in the Surface and Cave Waters at Mammoth Cave National Park

CATEGORY: Synoptic

PARK: Mammoth Cave National Park (MACA)

USGS Lower Mississippi-Gulf Water Science Center

Comments:

<p>This proposal highlights not only sound science, but is a good fit for a number of concurrent and interrelated studies to better understand the whole of the surface and subterranean ecosystem at MACA.</p>
<p>The cyanobacteria and cyanotoxin investigative approach in a unique (cave) environment with many environmental factors (light, temp, nutrient) held relatively constant is an interesting way to potentially determine factors of growth and development of HAB events.</p>
<p>Very solid proposal. The incorporation of universities and other interested parties is excellent. Ranked the transferability a little low as Mammoth is a unique environment and not sure how many other parks would benefit from the work.</p>
<p>Proposal mentioned that there is a possibility that routinely monitored environmental parameters could provide an early warning for cyanobacteria. Is there no research regarding this? what makes this study different than other studies and predictive model?</p>
<p>There are multiple claims of top priorities a MACA but no reference as to what process prioritized these different things (GMP, foundation doc, etc.)</p>
<p>Loss of potential partnership opportunity but seems like risk (at least to amphibians) is only potential.</p>
<p>Impressive opportunities for collaboration with citizen science volunteers and university students. Investigators have expertise.</p>
<p>Proposal does not address the O&M of the in situ continuous monitors, nor the data management (which takes considerable time and effort). Unclear how many sites would be instrumented, where they would be, how often they would be serviced, etc. Believe that this element has not been thought through, nor budgeted for.</p>
<p>While scientifically interesting, the proposed work doesn't establish a strong tie-in to specific resource-management needs at the park. Would have been more supportive of a focused study on the amphibian ponds (where true algae blooms have been observed) than the broad, "shotgun "approach outlined in this proposal.</p>
<p>Formatting note: Ranking Criteria #4-Technical Soundness, is labeled #5.</p>

National Park Service/USGS Water Quality Partnership Characterizing the Water Quality and Algal Community Status of Lake Mead and Lake Mohave During Remote Sensing Satellite Overflights

CATEGORY: Synoptic

PARK: Lake Mead National Recreation Area (LAKE)

USGS Nevada Water Science Center

Comments:

Two factors that hinder this proposal's ability to express the need for this issue to be addressed as a top priority issue include that the TISL model already exists "in a useable form" and that advancements in treatment of wastewater from Las Vegas has resulted in no major blooms since 2001. Understanding that the model can be advanced by the collection of these data, and that other factors may make conditions riper for blooms in the future, these two conditions still do weigh on the overall rating when compared to issues with ongoing major impairments and/or no information.

Where does this project sit in the Park priority ranking?

In the background section, it is stated that blooms reduce dissolved oxygen levels. During the "bloom" period, photosynthesis is rampant and DO levels are elevated; it is not until die off begins that bacterial metabolism uses up the available DO and can impair aquatic life. If so, future clarification would be helpful, and will inform where in the bloom/die process an area is when collecting field water quality parameters.

Seems like a good project, but the proposal lacks detail.

What is the difference between HAB and cyanoHAB? Would the field crews be able to actually map the HAB with GPS units? Also, is the remote sensing model able to show density or severity of bloom given the field data that will be collected? Will there be any statistical analyses of the field data to see what water quality controls there are on HAB- PCA, etc.?

It is unclear how much better the model will be with this information. It is also unclear why this new information is needed, exactly. Why is the current model not useful and not on a useful time-scale? Urgency: this is a potential problem. There is no mention of partnership opportunity loss.

More details are needed on statistics, methods, products, and personnel.

It is unclear if the resulting ground-truthed model will be applicable elsewhere or will only be useable at Lake Mead? Will the actual model be transferable or just the methods used to collect field data?

Two objectives that are clear and focused. Clear Methods section. The proposed work would enhance the nation's ability to use remote-sensing for HAB detection and tracking and lay a foundation for early warning.

Suggestions for sampling design: The absence of chlorophyll samples is rather glaring. There are several laboratories that analyze them more cheaply than the NWQL (maybe the SNWA or a university would do them?). Regarding cyanotoxin samples, it would be prudent to collect toxin

samples during every visit and freeze them. If the algal taxonomy analysis shows that toxin producers are present in decent numbers, the toxin samples could then be analyzed.

This project is missing the mark. It seems the park is an incidental outcome for the study and this is about providing ground-truthing data to TSIL. Also Mohave is not a NPS unit so not sure what the relevance to the study is. It appears the park is not interested too much in the study as it is stated if priorities and staffing allow, a second crew will be provided.

National Park Service (NPS)/U.S. Geological Survey (USGS) Water Quality Partnership Chemistry and Source of “Trapped” Saline Water: A Prototype for Future Effects of Sea-Level Rise on Archaeological, Cultural, and Ecological Resources, the Jamestown Island Unit, Colonial National Historical Park

CATEGORY: Synoptic

PARK: Colonial National Historical Park (COLO)

USGS Virginia Water Science Center

Comments:

Several small formatting inconsistencies and grammatical errors throughout. Would benefit from another non-scientific review.
From the proposal it seems that adaptive management practices are being developed regardless of the information provided by this proposed study. What does this study offer that would substantially improve the AMP product(s)?
Sea level rise is a concern, and this study will provide information to the park to help make decisions. The problem is real but the park cannot likely do anything about the problem and just respond, which I think is what this study is about. Is understanding how the saline water gets trapped a key component to preserving the potential degradation of the seal-level rise?
The budget lacks detail. Lab/salary/per diem costs should be expanded to hours/days/person/analysis/etc. Not exhaustive detail but more than is provided in a proposal requesting \$150k. Additionally, what are the nearly 50% overhead costs attributed to, and why are there budget items that are \$0 for both years?
There is a significant difference between public presentation of results and the development of an SIR report. The final products should be better identified and budgeted for accordingly.
The Project Ranking Criteria section is in general not as well constructed as the remainder of the proposal. -In problem definition, recounting the number of pages dedicated to the issue does not correlate to the level to which the topic has been successfully addressed. -Where is the project in park ranking priority? -Severity of the issue could be more thoroughly explained -Cost effectiveness is limited to one element (soil salinity vs. pH) of the overall project. -Project support and budget lack necessary detail. What is the plan if you can't get sufficient water from new larger diameter piezometers? A pilot sample might have been good to verify that the age dating will work.
No mention of statistical analyses that will be utilized. Sample size seems low- will you have enough statistical power to identify any significant difference? No mention of permits needed.

Proposal did not address 6 criteria for significance. Could assume that the resources is unique giving it 1 of the 4 required criteria.
It is unclear how the project could be transferred to other areas and if anyone else has already expressed interest.
Is the one well better because it costs less or because it doesn't interfere with cultural resources?
Examples of potential management actions that could be decided on based on information would be helpful.
A well-planned, thought-through approach. Timeline is reasonable. Costs appear reasonable, although additional details about salary (no. of hours) would have been appreciated.
Has degradation of near-surface organic material been ruled out as a contributor to pH changes?

Synoptic survey of cyanobacterial bloom distribution, toxicity, and associated water-quality conditions in Bighorn Canyon National Recreation Area, Montana and Wyoming

CATEGORY: Synoptic

PARK: Bighorn Canyon National Recreation Area (BICA)

USGS Montana-Wyoming Water Science Center

Comments:

Extremely long proposal. There is a lot of background information but it is unclear how all of it relates to HAB and the proposed project.
With only 9% of the Bighorn Lake catchment under NPS management, is there a significant level of NPS ability to enact any basin-scale management practices to mitigate the sources of these blooms? This likely impacts the level to which "problem resolution" can be achieved.
It is difficult to read many of the location/feature labels on Figure 1.
The relation between phytoplankton blooms and mercury methylation is a significant one (and imminently transferrable); it would be advantageous to highlight this more in the proposal.
Though the problem of blooms and their associated water quality impairments will not be resolved through the completion of this project, the data density and quality proposed here would be sufficient for making high-level decisions with little to no additional data collection. Well-constructed.
Why is I&M not sampling the lake? Only health effect was reported in 2003? It is unclear what previous studies are lacking- seems like a lot of information that has the bloom conditions well characterized? How has this previous data informed this proposal and how will the proposed project add value? Pilot data would be good to verify there is even a problem.
Specifically states that not a priority for NPS because it is a potential issue.
Why change up the sampling plan in year 2? There is no mention of picking sites in year 1 based on eutrophication gradient? How long do the DNA methods take to complete?
It is unclear what aspect would be transferable: the methods or the data/ end result.
It was nice to see potential management actions that could be taken at the end of the project.
Study design is appropriate for stated objectives-a synoptic survey to determine the extent and severity of blooms and related WQ effects. Note that sometimes, summer blooms reflect nutrients delivery that occurred earlier in the year (snowmelt, spring monsoons, etc.), so sampling only during July-September may yield an incomplete picture of causative factors. Not sure that this is relevant to Bighorn Lake, don't know what the lake's retention time is. Including the analysis of <i>hgcA</i> gene sequences is a nice addition.
How will it be possible to prepare the final report at the end of year 2, if data collection is ongoing?

Well thought out proposal with methods that can be transferred to other parks. The potential collaboration between USGS, NPS and the states of MT and WY is a bit plus to me. Shows there is a concern beyond the NPS and the states are vested in the study.

Kudos for including a Data Management Plan.

Detecting and mitigating glacier lake outburst floods with measurements of conductivity and turbidity in Wrangell-St. Elias National Park, AK

CATEGORY: Technical Assistance

PARK: Wrangell-St. Elias National Park and Preserve (WRST)

USGS Alaska Science Center

Comments:

<p>Would rather have seen this as a synoptic study proposal to allow for more data collection time and an analysis/reporting of the level of success of the effort and/or a development of a methodology document.</p>
<p>Concept is achievable, but is one year of data collection enough? I think this would be a good one year study as a pilot to gather the initial proof of concept information then submit as a synoptic or intensive, likely a synoptic. Would this have been better as a synoptic type study to where the chance is better to get a "normal" year? What if they are exceptionally dry for the year and the events do not have the same magnitude? The methods are appropriate and I feel can produce the result, but would prefer to see more than one year of data for this type of effort.</p>
<p>The budget section in the project ranking criteria does not agree well with the description in the main text.</p>
<p>Proposal did not address 6 criteria. Resource is unique but it is unclear how much of a priority this is for the park.</p>
<p>No discussion of alternative methods evaluated for cost savings. Calculate total in kind and percentages.</p>
<p>The basic WQ monitor setup is reasonable and clearly addresses public safety and park property-management concerns. It also provides basic data that could support future analysis of WQ fluctuations in response to different flow-drivers, so there's a valid scientific interest. However, it's unclear if anyone would pick up that ball and run. Based on the problem statement, there's no need to include pH monitoring.</p>
<p>Potential benefits of the proposed SSC sampling, surrogate-record development, and load computations are not well stated. It's likely that one would need many more SSC samples (20-ish, as opposed to the proposed 6-10) to establish turbidity/SSC regressions and compute loads, especially if doing a separate model for the glacial melt season of July-August. I realize the melt season is short, so it would be challenging to obtain samples over the range of the hydrograph.</p>
<p>The proposal provides few details about operation and maintenance of the WQ monitor. How many site visits? Who will provide the field monitor for side-by-side checks? Is a backup sonde available? Very few budget details (any travel costs, field supplies, etc?).</p>

This statement makes me nervous: "NPS staff trained to assist USGS personnel in suspended-sediment collection, sensor maintenance, and direct discharge measurement will provide support throughout the duration of the study." In my experience, NPS staff already have all the work they can handle; therefore, this might not be a realistic expectation.

Cyanotoxins in Fish: Assessing the Risk	
CATEGORY: Technical Assistance	PARK: Voyagers National Park (VOYA)
USGS Upper Midwest Water Science Center	

Comments:

Good proposal. Impressive to see a publication resulting from a 1-year technical assistance request.
What are the WHO levels based on? Could you use those concentration levels to warn fisherman?
What statistical analysis will be used? How many fish will be analyzed? No mention of permits.
Will two years of data provide enough information to produce a predictive model of all potential ranges of toxin concentrations? Do you have enough historical water concentration data to determine how it has accumulated over time?
What can the park do if the project determines the fish are bioaccumulating these toxins? Other than putting out a fish consumption warning. Are there any potential management actions that could be taken to reduce the risk to wildlife and human health?
Would have liked more detailed info on QA/QC for the UGA fish-tissue analyses and the SUNY water analyses. How many blanks, replicates, spikes, etc. The labs should run spikes to check recovery. Proposal states UGA will confirm ELISA-positive samples with LC/MS/MS analysis; would be wise to also "verify" a few ELISA-negative samples.
This is an extremely timely study to coincide with the work currently being undertaken by the partnership. Not conducting the study now would result in a more costly study later. The buy in from the local agencies with the sample collection and fish already to go makes this project ready to go.

Occurrence, Sources, and Potential for Adverse Effects of Anthropogenic Bioactive Chemicals in Surface Water in Great Smoky Mountains National Park

CATEGORY: Technical Assistance

Park: Great Smoky Mountains National Park (GRSM)

USGS South Atlantic Water Science Center

Comments:

Good project, but not sure what the data will provide to the park? How can the park manage or remediate the contaminants? With a year study, I do wonder about what are the hydrologic conditions at the time of sampling? One year of data for this kind of study may be hard to discern what is happening in the streams? What if too wet or a drought period? Seems if not a "normal" year of data it may be too biased one way or the other to provide an all-encompassing management decision.

Does the term "environmentally relevant concentrations" indicate that there are no action levels, etc. established for these compounds? If so, is there any indication at what level these compounds begin manifesting the sub-lethal effects noted in the proposal?

While sampling at two high visitation times will presumably give the highest returns on these analytes, should there not be a complimentary sample set during low use times to frame the magnitude of visitor use on the presence and concentration of these compounds? Funding limited for this proposal I understand; I would recommend one high and one low period rather than two high periods.

High transferability of this approach to other park units which are often at the top of their respective watersheds and discharge waste within their boundaries.

The evaluation write-ups were not very well written and seemed to jump all over the place instead of focusing on the criteria/ question being answered.

Aren't these chemicals pretty ubiquitous? How has the previous sampling informed this proposal? It is unclear what these proposed samples add to the previous samples. If you have already determined the BOC are present, how do new samples add value? The priority ranking should have been listed under significance criteria not problem.

Didn't actually address most of the 6 criteria for significance.

Why 2 samples per site? Does 2 samples per site give you enough information to determine variability and potentially identify outliers? What if the 2 samples vary significantly? What statistics will be used for any analysis?

Addresses enabling legislation; Federally listed T&E species; threats to the park's renowned aquatic biodiversity. High scores for criteria 1 & 2.

PI is a leader in this field, with a proven track record and expertise.

Duration is one year, but if samples are collected in months 7-11 (April-August) of FY19 as proposed, the data won't be back by the end of month 12.

A little surprised there wasn't a larger study proposed, but this is a good first step.

Mercury and Dissolved Oxygen Monitoring in Support of Mercury Bioaccumulation and Sediment Transport Research, Lake Powell, Utah and Arizona

CATEGORY: Technical Assistance

PARK: Glen Canyon National Recreation Area (GLCA)

USGS Utah Water Science Center

Comments:

Should better describe/distinguish between elemental and methyl mercury and the related water quality implications.
Continuous DO monitoring is proposed "to help interpret apparent redox boundaries" in the sediment trap and core layers. This approach seems to skip the step of confirming what those dark layers actually are. Would have been stronger is there was some sediment fingerprinting, direct analysis of redox potentials throughout the cores and traps, etc. (maybe this is part of the other investigation?). Redox "boundaries" may be transient and mobile in the traps. Propose to deploy miniDOTs at 3 depths in the hypolimnion at each site. These devices log internally; data will be downloaded during quarterly site visits. Not familiar with these sensors; however, because they will be deployed in the hypolimnion, quarterly servicing visits are likely going to be inadequate to address fouling.
The link between the Gold King Mine and DO fluctuations is not solidly made, nor is how the link between current water quality and past sediment deposition is going to be made.
Generally speaking, rather than focusing on a singular event (GKM - that may have name recognition, understand the desire), a more general look at how extractive activities in the San Juan Basin over the past century-plus has accumulated contamination in lake sediments seems more appropriate.
There is no mention of the role of other sources of mercury (adjacent coal-fired power plants for example) and with what level of confidence present contamination can be attributed to mining.
The "objective" of the project is stated as different things in various places within the proposal.
Proposal states that EPA believes 80% of metals are in sediments of river, What happen to other 20%- did it get washed into Lake Powell?
What has the sediment trap data from 2015 told you so far? How has that data been used to inform proposal? The problem description in the front section was very confusing but the paragraph under ranking criteria was much more straight forward and understandable.
Only 1 significance criteria was address in ranking criteria paragraph but proposal does mention the foundation workshop and the fact that Lake is fundamental to park and enabling legislation says so.
Good descriptions of QA/ QC and calibration procedures that will be implemented for Sensor deployment
It is unclear if data could be used or methods at other locations and if either could be used in other environments (i.e. not lake)

Mention management options as result of data- are these planned and budgeted just need to decide which one?
The GKM spill and high Hg are definite concerns. Lake Powell WQ is a Park priority. This proposal dovetails with related, ongoing research. Proposal didn't specify why determining fluctuations in redox would be important; i.e., the impact of redox on mercury-methylation processes.
The text supporting the project from the NPS website does not highlight the importance of the research, just that it is happening.
It wasn't clear how the continuous DO record and sediment-trap layers would be correlated in time.
No issues with bottom water and sediment sampling, as long as they are using clean-hands techniques, other than the fact that quarterly sampling will not provide a lot of data. That's a constraint of limited funding.
DO concerns in Lake Powell were better described in the Park's support letter, and they go far beyond the impact of DO on mercury. Sounds like they might benefit from some AUV surveys.
A proposed project that is taking advantage of ongoing work that can be coupled with ongoing work on the lake. The use of the DO loggers is a good approach to the study and will provide valuable information not just for the Hg component in this study but complementary to sediment trap work related to the Gold King Mine blowout.

Assessment of Groundwater Quality Including Radon at Capulin Volcano National Monument

CATEGORY: Technical Assistance

PARK: Capulin Volcano National Monument (CAVO)

USGS New Mexico Water Science Center

Comments:

In addition to a potential contamination issue, the collection of these data are important to understanding the source, pathways, and recharge mechanisms that relate to the long-term viability/sustainability of the groundwater supply.

This is a concern and is clear with there being only the one well. I would prefer to see more radchem work and lest organic in this study. With a well around 680 feet dep and depth to water around 640, what are the chances of organic compounds? I think some U or Th isotopes would be better suited to the study. Additionally if Radon is the main concern, consider adding Rn replicates to every sample event. Rad Data can be variable and working with the uncertainty of the counting have replicates every sample even will be a bonus. Why tritium? Seems unlikely to be present. Do you think there is a well construction issue? IF you have reason to believe younger water in the system, then keep the pesticides and 3H in the study. Really like the trace gas sampling will be great idea.

Budgeting/project support does not describe how 80 hours of IMR Hydrologist will support the project.

Does three times in one year give you enough information to tell you temporal variability? Also is temporal variability necessary given the health implications- if radon is present at all, wouldn't you want to treat drinking water?

It is unclear why the age dating is necessary- does this have to do more with supply and recharge? If so, the proposal does not address that issue in the problem definition.

Proposal states that staff and patrons should reasonably expect the drinking water is safe but seems to me that there is no actual evidence to support that and that should be communicated. Seems like there should be different funding source available for these types of samples.

Proposal did not address 6 criteria for significance. But there is human health concern.

Technical: More description of the "hydrologic seasons" is needed. What does this refer to and what does the previous data about this tell us. No mention of statistical analyses or how the data will be analyzed or summarized.

It is unclear how transferable the information will be- is the age dating methods new and this project would provide an SOP for other parks?

Clearly defined objective: This project is focused on determination of whether or not radon is present in the groundwater supply to Capulin Volcano NM, and if it is, characterization of concentrations and temporal variability through the year.

Didn't make a strong case for sampling pesticides or nutrients (\$4,889). Suggest they collect the blank first, then the replicate.

Martin (2015) is not in the references section.

Integrating multi-year, multi-source data to assess pre-restoration water quality and support adaptive management plan in the Herring River Estuary, Cape Cod National Seashore

CATEGORY: Technical Assistance

PARK: Cape Cod National Seashore (CACO)

USGS New England Water Science Center

Comments:

The story map is an interesting use of new data outreach techniques that should increase public understanding of generally dense and difficult to digest data. Kudos.
It would be nice if this project would also provide recommendations for future sampling both methods that could be standardized across partners and locations that are useful to analysis or those locations that are not useful/ not needed.
Guessing this is not the only park with lots of data about in an unusable format. Like the idea of trying to bring it all together. If managing the resource is to be done properly, then the electronic availability of this data is a must. This is well thought out proposal that provides much information to the park.
Loss of opportunity due to timeline of permit process. It is unknown what the impact to the resource might be if project is delayed.
It is unclear how transferable the methods will be. Will there be a methods publication or SOP published to help other learn from this project's methods?
It is unclear whether the end product will be directly used as part of the permit process or whether the information will have to be repurposed. It is also unclear how the end product will "provide the necessary information... for implementing management actions that will resolve the issue of potential water quality changes..." since the data being analyzed for baseline information. What management actions will be implemented as a result of this data? Give some examples.
Very well written, simple and straightforward. In addition to enabling legislation, proposal addresses Fundamental Science Practices (NPS data may not be QA'd nor are they publicly available). Supports development of the Herring River Restoration Project Adaptive Management Plan.
It is unclear why this data synthesis hasn't been done.