# NPS-USGS Water Quality Partnership Program

# 2016

Work Group Comments – Proposals for New Projects Commencing FY2016

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| Comparison of Water Quality Degradation and Periphyton Community Condition in Big Cypress National Preserve | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Big Cypress National Preserve (BICY)** |
| **USGS Wetland and Aquatic Research Center** | **YEAR 1 COST: $ 98,622** |

Comments:

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| The proposed work should have more focus on the intended outcomes. For example, one of the most valuable objectives of the proposed work is to derive biotic indices; however, the term "biotic indices" isn't used anywhere else in the proposal, and it is glaringly absent in the Products. |
| Seems like QW should be measured in canals that will contribute to rehydration project. |
| It would have been helpful to provide map of basins so some spatial understanding and differentiation of what was to be sampled in addition to canal location or source water. |
| Why is copper the only trace metal being measured, not mentioned in proposal? Again no funds indicated in budget for these measurements. |
| Some of the figures were so small that they were nearly impossible to read. |
| Tell us why periphyton community condition is important to the Park. How does it relate to broader the ecological system or other receptors, like aquatic invertebrates? (In other words, why should we care?) |
| Not clear if QW of canal water is being measured as part of the current project or if it is obtain from another source. Budget does not include costs for QW analysis. |
| "Products" section should tell how the data will be published or otherwise disseminated to the public. |
| Is the source water used in the mesocosims equivalent to the Preserve? If not how might this effect the results? |

| Bacterial Monitoring and Source Tracking, Chattahoochee River National Recreation Area | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Chattahoochee River National Recreation Area (CHAT)** |
| **USGS South Atlantic Water Science Center** | **YEAR 1 COST: $ 99,870** |

Comments:

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| Powers Ferry and Paces Ferry sites are not that far apart, has any preliminary data been collected to compare timing and magnitude of E coli levels at these 2 sites? |
| This proposal includes an impressive amount of in-kind support. Congratulations on building partnerships with other stakeholders in developing this proposal. |
| A project was funded in 2000 to study microbial source tracking, how is this work different? |
| If park concessionaires are the ones losing business some effort to obtain their financial support might have been indicated or attempted. A summary of previous work and impacts on this study was not mentioned. |
| Bacteria counts already being monitored at 2 stations, if the new location is so important why was it not initially selected as a monitoring site? Or why not move one of the existing stations? |
| Well-conceptualized study with a great emphasis on quality assurance and technically sound methods. |
| Is fecal source tracking going to change the management action (i.e. posting of warnings and closure of concessions)? |
| This proposal did an excellent job on stressing the significance and severity of the problem with excellent descriptions of quality assurance and overall technical soundness. |

| Will Clarity and Dissolved Oxygen in Crater Lake Change in a Future Climate? | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Crater Lake (CRLA)** |
| **USGS Oregon Water Science Center** | **YEAR 1 COST: $ 100,000** |

Comments:

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| What happens to clarity in years when mixing does not occur? |
| I would have scored the Severity of Resource Threat, Problem, or Need higher if impacts other than clarity had been better described. What types of aquatic life are supported by the Lake? The NPS letter of support mentions "bottom dwelling invertebrate communities." Tell us more about those! |
| Seems like there is extensive ongoing data collection, are more DO measurements really needed? |
| The high-quality documentary video by itself would be a nice technical assistance project. |
| Not clear how the metagenomics data will be used in the model |
| Problem resolution was a huge challenge here and not addressed well in the proposal. Why do the study if the only problem resolution might be public education? |
| Methods for quality-assurance of the water-quality data should be described. The purpose for collecting chlorophyll fluorescence data wasn't clear. (Chlorophyll wasn't mentioned until the budget section.) |
| Don't the higher air temperatures over the past 20 years already represent a change from the norm? Why use present conditions as the reference state rather than the pre-1990's temperature regime? |
| Problem Resolution scored low because the proposed resolution (educating the public) can be undertaken with the extant data, without conducting the proposed modeling effort. |
| $300,000 seems expensive for a 1-dimensional lake model for biological productivity and DO. |

| Water quality and development of remediation plan for Stampede Creek, Denali National Park and Preserve, Alaska | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Denali National Park and Preserve (DENA)** |
| **USGS Alaska Water Science Center** | **YEAR 1 COST: $ 100,000** |

Comments:

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| The comparison to the USEPA drinking-water criterion of 6 µg/L is a poor fit for evaluating potential adverse effects to aquatic life. The Nam & others (2009) reference found that trivalent arsenic has LC50 values of 12.83 to 261 mg/L, equivalent to 1,283 µg/L on the low end. In a 1988 publication, the USEPA calculated a draft freshwater National Ambient Water Quality Criteria for antimony of 30 µg/L (see p. 4 of USEPA# 440-5-88-093), which would be a useful basis for comparison. |
| Seems like a small and fairly simple watershed with a tailing pile contributing metals to the stream. |
| If the site is remote enough to require helicopter access, what options are even feasible for remediation? |
| Should tell us which type of aquatic life are supported or affected by the water quality in Stampede Creek. |
| Important information on remediation options being tested by model is lacking. |
| Significance of this issue to the parks priorities for water quality science support was not well demonstrated. There seemed to be no urgency to perform this work or any time-sensitive triggers to get this work done. |
| When evaluating the sediment data, consider using the sediment-quality guidelines for antimony (TEC of 2 mg/kg, MEC of 13.5 mg/kg, and PEC of 25 mg/kg) documented by Long and Morgan (1991, NOAA Technical Memorandum NOS OMA 52). |
| Because extensive QW data already exist for the watershed, perhaps a simpler and less costly study could answer the same questions |
| The idea of replicate synoptic sampling shows a high level of attention to the quality of the data. |
| Wasn't clear how urgent the need was to have a remediation plan. |

| The Role of Nutrients in Fish Kills at Rodeo Lagoon, Golden Gate National Recreational Area, California | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Golden Gate National Recreation Area (GOGA)** |
| **STATE: California Water Science Center** | **YEAR 1 COST: $ 99,928** |

Comments:

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| Great photographs and illustrations! The graphics do a nice job of supporting the proposal text. |
| More background on the lagoon would be helpful for evaluating the urgency of this project. |
| The proposal did an excellent job of stressing both the significance and severity of the problem to the park and coupled with high technical soundness and scientific merit in the study approach results in a high priority for support for this work. |
| Has this always been a problem or did the fish kills become more common in recent years? |
| Unclear as worded whether the chlorophyll concentration of 1,000 mg/L was observed in 2004, as implied by the reference to figure 3. More likely, it was observed in 2007, as described in Cousins & others (2010). |
| Is the lagoon natural or has it been altered in size or shape? |
| The authors should describe more explicitly the planned quality-assurance practices for the field methods used for sample collection and the laboratory methods used for analyses of samples. |

| Characterizing the Origin, Nature, and Distribution of Radioactive Constituents in Thermal Spring Water at Hot Springs National Park, Arkansas | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Hot Spring National Park (HOSP)** |
| **USGS Lower Mississippi-Gulf Water Science Center** | **YEAR 1 COST: $ 99,925** |

Comments:

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| If radionuclides are naturally occurring how can they "pose a direct threat to the thermal waters"? |
| The QA Plan should include field blanks for the water samples to ensure that sampling equipment and processes aren't a source of radioactive particles from dusts or cross-contamination between sites. |
| Seems like human health is the main issue, monitoring of radiation levels and radon gas in park structures might be more effective than monitoring waters at the spring source |
| Might be better to use the term "hazard" rather than "contaminant" because the radionuclides are naturally occurring. |
| How are the data and interpretive products going to be peer-reviewed? How will the data be archived? These details should be addressed as if for a standard USGS proposal, per Fundamental Science Practices. |
| Might be better to use the term "hazard" rather than "contaminant" because the radionuclides are naturally occurring. |
| The proposal does not make a good case for severity of the threat and especially not strong in the areas of problem resolution. Generally, naturally occurring geochemical properties in parks are not a high priority for targeting resources. |
| I'm skeptical of claims that the proposed work would enable one to "predict" how the radioactive contamination might change over time. Are you limiting the predictions to those made based on half-lives and concentrations of the radionuclides found, or are you also considering future changes in hydrologic flowpaths, etc.? The proposed methodology for predictions should have been clearer. |
| The proposal states that "all samples will be analyzed by the USGS National Water Quality Laboratory;" however, radon is the only radioactive constituent that the NWQL analyses "in house." All other radchem water samples are analyzed through NWQL contract by ALS in Fort Collins, CO, with QC built into the contract. It is unclear which laboratory will do the analyses for the mineral precipitate samples. |

| Water-Quality Monitoring and Analysis to Address Impairment of Endangered Mussels in the Obed Wild and Scenic River | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Obed Wild and Scenic River (OBED)** |
| **USGS Lower Mississippi-Gulf Water Science Center** | **YEAR 1 COST: $ 100,000** |

Comments:

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| Seems like a project is mainly focused around operation of in situ nitrate sensors at 3 gaging stations rather than a discrete study to address a key park issue |
| If this is funded, please clean up any typos (e.g., total dissolved solids, etc.). |
| USGS OWQ Technical Memorandum 2007.01 (a memo on laboratory evaluation that has been superceded by OWQ 2014.01) is mentioned, which implies that a laboratory other than the NWQL would be used; however, |
| No discussion around or acknowledgement that increasing temp. Could be a driver of mussel collapse seen. |
| There is much emphasis on nitrate yet importance of this stressor has not been demonstrated |
| The proposal makes a good case for the significance and severity of the threat and issue but the study work actually performed does not connect well to that. The actual work performed is very heavy on data collection of continuous nitrate. |
| Not clear from the introductory material when the 'catastrophic collapse' of the mussel populations occur? Is this due to recent changes in water quality? |
| Would have been helpful to know current level of water treatment (primary, secondary, and tertiary?) and most recent upgrade at Crossville WWTP. |
| Score for Project Support accounts for value contributed by concurrent studies and data-collection efforts. |
| Liked that the Introduction identifies which causes we can rule out for the mussel population declines. |

| Assessing Pharmaceutical Exposure and Associated Biological Effects to Freshwater Mussels inhabiting the St. Croix and Mississippi Rivers | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Saint Croix National Scenic River (SACN)** |
| **USGS Minnesota Water Science Center** | **YEAR 1 COST: $ 99,464** |

Comments:

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| QA samples should include matrix spikes so that it's possible to determine the analyte recovery in the matrix of interest, not just reagent water. |
| Can the biomarker analyses distinguish impacts due to pHACs from other contaminants? If not then how will the measurements be useful in determining the link between PHACs and mussel health? |
| Some discussion of how analysis for PhACs or how the analytes suite differs from the seemingly broader PPCPs suite would have been helpful. For example, is the focus on pharmaceuticals more restrictive/selective a suite than ECs in general, chosen for a particular reason as a suite of EC's analysis would include many of these same analytes. |
| Solid baseline study to provide lacking information, could other organic contaminants be added? |
| Are you really planning to store pore-water samples in glass at -20°C (thus freezing, breakage)? |
| Previous project on occurrence and effects of pharmaceuticals in St Croix, how is this study different? |
| This proposal exhibited a very high level of scientific merit but little in the way of problem resolution hence it was hard to promote this study highly given many others with better likelihood for actions by NPS based on findings for problem resolution. |
| Route & others (2014) studied perfluorinated compounds, which aren't in your list of PhACs, so what is the linkage? It's a stretch to imply that eagles indicate the same routes of exposure as mussels. |
| Why only PhACs and not the other contaminants in treated effluent, including industrial compounds used in higher volumes? Tomasek & others (2012) showed wastewater indicator compounds in the St. Croix R., so how would you know whether it's PhACs or WICs that are to blame for toxicity or endocrine effects on mussels? Why leave the WICs out of this study? (Some labs do both.) |
| Budget is lacking detail |
| Not controlling for hydrologic conditions can create biases in the data; for example, if sampling occurs over different years and seasons, it would be hard to tell whether a higher concentration of PhACs is due to higher source concentrations or lower flows. I recommend modifying the sampling plan to control for hydrologic conditions and water temperature, both of which can affect mussels. |
| The pore-water sampling presents technical concerns. Assuming a porosity of 0.50, removing 3,000 mL (2 L rinse and 1 L sample) affects a sphere with a radius of 11.3 cm, which exceeds the 5-cm depth of interest, which means pulling in overlying surface water. Reduce the volume of sampling equipment and the sample for a combined total ~ 1 L if you want porewater within a 5-cm radius/depth. |

| Occurrence, Fate, Transport, and Ecological Effects of Aerially Applied herbicides in the effort to control invasive buffelgrass (Pennisetum ciliare syn. Cenchurs ciliaris) in the ecologically sensitive desert ecosystem of Saguaro National Park | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Saguaro National Park (SAGU)** |
| **USGS Arizona Water Science Center** | **YEAR 1 COST: $ 99,972** |

Comments:

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| Nice project that has greater urgency than many projects. |
| Should some tissue be analyzed for organic contaminants just to confirm these compounds are not accumulating? |
| Overkill to collect stable isotopes of H and O, plus tritium and noble gasses and sulfur hexafluoride. Glyphosate is a recent addition to the land surface, so you don't need to differentiate between varying ages of "old" groundwater. You could drop one or more of these age-dating analyses to save funds. |
| Proposal lacking some details on sample collection particularly the auto samplers. |
| Excellent proposal but found a few instances of additional editing for typos |
| There was more emphasis on the threat of the bufflegrass than the severity/urgency of the glyphosphate effects on water quality and biota. |
| Also use of auto samplers for storm sampling can be tricky, is there a backup plan for other types of sampling in the event that few storm samples are actually collected? |
| Since glyphosate is nonselective, did you consider assessing its potential effects to the saguaro cactii? |
| I understand the monetary reason to divide the lab analyses across two fiscal years, but from a data-quality perspective, it would be better to do all of the analyses within a limited time period, if possible, to minimize changes attributable to variations in laboratory performance. |
| Background samples should be collected from Chiminea too, not just Madrona. The proposal says, "the controlled spraying will occur on the eastside of the Park in the Chiminea (control) and Madrona (treatment) watersheds." Does this mean Chiminea will be sprayed? |
| The claim that "these additives are rarely specified but they add to the toxicity of the mixture and the environmental fate is likely similar to that of glyphosate" should be supported by a reference or made less absolute. Many additives differ from the active ingredient in terms of toxicity and fate. |
| Clarify whether dye will be used in the spray (as was done in the past) and how the dye may affect how you target the sampling sites. |

| Spatiotemporal Variability of Stream Temperature in Headwater Streams: Rio Grande Cutthroat Trout Habitat Suitability in the Jemez Mountains, Valles Caldera National Preserve, New Mexico | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Valles Caldera National preserve (VALL)** |
| **USGS New Mexico Water Science Center** | **YEAR 1 COST: $ 99,694** |

Comments:

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| Project mostly focuses on GW-SW interactions and influence on the thermal regime of streams |
| The proposal does not clearly substantiate whether any temperature issues are actually occurring that would affect the cutthroat trout. Do you have any evidence of temperature being a problem? |
| Need to ID, explain and better sell how the results from this study could provide an effective mitigation method in the context of increasing climate temperatures given that only 11.6% habitat remains and there are non-native invasive better adapted to the new/changing temperature regime. |
| This seemed like a groundwater surface water physics study with some water quality added to qualify for the proposal program. |
| Well written proposal but lacks a strong QW component |

| Using molecular tools to understand and predict cyanobacterial harmful algal bloom toxicity in Kabetogama Lake, Voyageurs National Park, Minnesota | |
|---|---|
| **CATEGORY: Intensive** | **PARK: Voyageurs National Park (VOYA)** |
| **USGS Minnesota Water Science Center** | **YEAR 1 COST: $ 98,570** |

Comments:

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| More development/discussion of potential causes or source of pollutants (N or P) and cause and effect for a seemingly remote area and large waterbody. One wonders if such a study could be done more cost effectively in a park without the remote (costly) sampling locations but results would still be largely transferrable in many respects to what is learned from such a study. |
| What's the plan for quality-assurance for the analyses performed by BSA Environmental Services? |
| The prior partnership study on this lake did a nice job in identifying the problem, significance severity and sources. This project is much more of a research-type effort with great scientific merit but it contributes significantly less in the areas of problem resolution. I would have liked to see stronger NPS in-kind support demonstrated as well. |
| Not sure of the wisdom of compositing the nutrient samples from several depths (top, center, and bottom). What if the nutrient distribution with depth is a primary explanatory factor or antecedent condition? |

| Water-Quality Assessment of Nutrients and Pathogenic Microorganisms in Geothermally Influenced Popular Swimming Areas within Yellowstone National Park | |
|---|---|
| CATEGORY: Intensive | PARK: Yellowstone National Park (YELL) |
| **USGS Wyoming-Montana Water Science Center** | **YEAR 1 COST: $ 99,930** |

Comments:

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| Do pit toilets, water treatment facilities, or septic systems exist up gradient of the 2 swimming holes? Or are the swimmers the chief source of nutrients for the two study sites? If swimming was eliminated, would the risk of PAM go away? The Problem Resolutions that are discussed in the proposal could be undertaken without collecting much more data |
| Cost seems high for proposed level of work perhaps a synoptic study we be more suitable |
| What method is proposed for calibration, deployment, and interpretation of the data from the nitrate sensor? What type of sensor do you plan to use? Has the performance of the nitrate sensor been verified for thermal waters in the temperature range of interest? |
| The proposal does not build a strong case for the importance of swimming holes to the Park. If YNP has over 3 million visitors per year and a maximum of 150 people visit each swimming hole over a 100-day summer period (30,000 swimmers per year), a maximum of 1% of the YNP visitors are affected. |
| The swimming holes are far from a crown jewel of this park and so this proposal suffered in both the significance of the resource to the park and in problem resolution. |
| The proposal mentions that extracting DNA from clay or humic substances is a challenge. Do the hot springs in question actually have clay or humic substances? I would suspect that a more likely matrix interferences for these sites would be the mineralogy resulting from the thermally derived waters. |

| **Potential for Impacts of Changing Groundwater Salinity, Geochemistry, and Levels from Sea-Level Rise on Archaeological, Cultural, and Biological Resources, Jamestown Island, Colonial National Historical Park** | |
|---|---|
| CATEGORY: Synoptic | PARK: Colonial National Historical Park (COLO) |
| **USGS Virginia Water Science Center** | **YEAR 1 COST: $ 50,000** |

Comments:

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| Nice to see geophysical techniques included in the proposed work. |
| The main product will be a GW model used to predict timing of flooding across the island. |
| It's good to see attention given to the water-quality impacts (direct and indirect) to cultural resources within the Park. |
| The main issue seems to be flooding of the archeological sites, deterioration due to changes in QW is secondary effect |
| Proposal was missing ranking criteria makes it a little more work to score |
| Linking and studying the interaction between physical and chemical processes and the high priority cultural resources was a novel idea and approach and contributed significantly to the significance, severity and scientific merit areas of proposal scoring. It suffered in the area of problem resolution but with additional information in hand from the study, engineering or other mechanical solutions might be prioritized or facilitated. |

| Emerging Contaminants and Nutrients from Septic Systems in Groundwater at Fire Island National Seashore, NY | |
|---|---|
| CATEGORY: Synoptic | PARK: Fire Island National Seashore (FIIS) |
| **USGS New York Water Science Center** | **YEAR 1 COST: $ 50,010** |

Comments:

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| Very well written proposal |
| Aren't fecal bacteria also of concern? (Why wouldn't they be?) Wouldn't sampling for fecal bacteria be less costly than doing so many expensive chemical analyses? |
| A very well written proposal that carefully addressed all the requirements of the RFP. Relatively good strength in all criteria areas with no significant deficiencies resulted in a higher ranking proposal especially given the more cost-effective synoptic funding category and request. |
| Quantitative estimates of water use by the 17 residential communities would have been helpful to know in assessing discharge to GW and ultimately GSB. A more detailed map of the area as a figure would also have been more informative. |

| Hydrocarbon Monitoring in Response to Personal Watercraft Regulation at Glen Canyon National Recreation Area | |
|---|---|
| **CATEGORY: Synoptic** | **PARK: Glen Canyon National Recreation Area (GLCA)** |
| **USGS Arizona Water Science Center** | **YEAR 1 COST: $ 50,000** |

Comments:

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| Please provide a reference to support the claim that the photolytic PAH degradates can be more toxic than the parent compounds. |
| Timely proposal, needed to evaluate effectiveness of management decisions regarding watercraft |
| I did not include salary for USGS researchers as in-kind support |
| Emphasis demonstrating the significance of the issue to the park was outstanding along with leveraging all past works in problem definition. Demonstrating in the proposal the technical soundness in the use of passive samplers helped greatly in that category as well as boosting cost-effectiveness. |
| Great attention to quality-assurance of the passive samplers for the proposed sampling effort. I'm also impressed with the good decision-making regarding the contamination issues for the SPMDs collected for the Schonauer and others (2014) study. (I suspect that if SPMD blanks that had been submersed in blank water had been sampled, less contamination would have been observed than for the trip blanks that were stored out of water, but there's no way to go back in time to test that hypothesis). |
| It’s been demonstrated that the presence of PAH's are at detectable levels in the water column and sediment but there was not much emphasis that the actual levels seen are or should be of a concern and causing harm. |
| Does the park enforce use of watercraft meeting emission standards? |

| Origin and Fate of Groundwater Resources for the Kalaupapa settlement in Kalaupapa National Historical Park | |
|---|---|
| CATEGORY: Synoptic | PARK: Kalaupapa National Historical Park (KALA) |
| **USGS California Water Science Center** | **YEAR 1 COST: $ 49,890** |

Comments:

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| The proposal does not present a water-quality issue to be remedied or solved. |
| No algal blooms and healthy fish even before septics installed so how will data aid management decisions? |
| It was not clear what the significance or severity of this issue is to the park and the problem definition and predevelopment information base was very lacking. The study seemed sound, cost effective and with excellent support but not just a high priority issue to tackle. |
| If sewage effluent is a potential concern, why not monitor more widely for pathogens and nutrients? Figure out whether a contamination problem actually exist before attempting to measure the flux. |
| This appears to be a study predominantly designed to understand GW flow rather than water quality. |
| More mention/further assessment of the anticipated GW flux to ocean based on precipitation amounts and aquifer properties (fractured basalt?) relative to discharge area would have been informative in determining if GW discharge locations are possible to ID or are so highly diffuse and diluted that it would be very difficult to see an effect. It's not obvious why subsurface groundwater discharge zones should be recognizable in this setting or their effects swamped by the flux of marine waters, currents, tides, wave action etc. |
| Also no mention of pre-septic QW data available for comparison. |
| There was little discussion of GW loading based on settlement population or park annual visitation. |
| GW for park is from well in watershed, not clear where this is relative to settlement and septic systems. |

| Water-Quality Sampling for Select Nutrients, Gasoline Hydrocarbons, and Glyphosate within Wind Cave National Park at Select Monitoring Sites | |
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| CATEGORY: Synoptic | PARK: Wind Cave National Park (WICA) |
| **USGS South Dakota Water Science Center** | **YEAR 1 COST: $ 50,000** |

Comments:

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| This investigation is well designed and it's refreshing to see follow up work to determine the effectiveness of mitigation activities, but is a 3-year study really necessary to answer this question? |
| Please clarify how contaminants "threaten hydrochemistry that affect mineral formation/dissolution and other cave building processes". |
| Did you consider sampling surface runoff or pore water from the land surface above the cave drip sites, particularly in the ditches or draws along service road and NPS staff parking areas to the east of the Visitor Center? The aerial view in Google shows over a dozen service vehicles parked on bare earth, plus several more vehicles parked on paved areas. Areas around the service road and NPS buildings clearly has been mowed, where is mowing and weed-whacking equipment refueled and is that a source? |
| The concentrations of hydrocarbons reported by Venezky seem very high, have you verified that the results are valid? |
| Proposal does not state the reason for analyzing glyphosate, is there weed control nearby that the park is concerned about? |
| Why not sample for PAHs? In terms of toxicity, PAHs have a higher toxicity to aquatic life than VOCs. If the travel times are as short as previous studies imply, there may be little or no opportunity for sorption to occur, and PAHs from car tires, asphalt, etc., could be an issue. |
| I'm not convinced there is an issue with BTEX contamination. I looked at the Heakin report and only non- detects and a few E'd values below detection were reported. It appeared that no QA was collected, however, complicating interpretation of these low-level detections. |
| Surface-water site #1 appears to be hydrologically disconnected from groundwater sites #3-6. What is the purpose of sampling there, rather than closer to the affected cave sites? |
| The most expensive analyses proposed are for Sr and U isotopes. Of all of the possible tracers that could have been selected, why Sr and U isotopes? Why not CFCs, as were used by Long and others (2012)? |
| A wise first step before going further with this project would be to sample the parking lot discharge from the drainage system to see if hydrocarbons are present or absent. |
| No rationale was given for why samples for glyphosate should be collected. What are the potential sources of glyphosate to the Park and to the water bodies within the cave system? |
| The proposal mentions biodiversity in the nutrient-limited water bodies within the cave system, but is there any evidence of harm to the microbial communities involved? Is there any evidence that the |

concentrations of VOCs and nutrients observed by Heakin (2004) are high enough to affect the aquatic life in the Cave?

| Monitoring Geothermal Activity in Southwest Yellowstone using Electrical Conductivity as a surrogate for chloride flux and creating a real-time chloride flux website for Yellowstone National Park | |
|---|---|
| CATEGORY: Synoptic/Fixed | PARK: Yellowstone National Park (YELL) |
| **USGS Idaho Water Science Center** | **YEAR 1 COST: $ 50,000** |

Comments:

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| Who benefits or is harmed by changes in the thermal flux? What can be done about it? |
| Not a project of great urgency particularly considering that the majority (85%) of Cl flux is already being monitored. |
| What practices will be used for quality-assuring the continuous data (i.e., within ~24 hours as described in http://water.usgs.gov/admin/memo/policy/wrdpolicy99.34.html?). What about QA/QC for the discrete water-quality samples? |
| If chloride monitoring is not applicable at fishing bridge (outlet to YELL Lake via Yellowstone River), it was not made clear how a "complete electrical monitoring program for CL in YELL will be achieved. This suggests a significant component of the geothermal drainage areas cannot apply EC as a surrogate. |
| Sound study and scientifically interesting but don't see any problem or issue to be resolved here by this work. |
| Although it is scientifically interesting to see the effects of rain on the rivers, wouldn't that effect would be a source of error in measuring the thermal signal? How would you compensate for precipitation as a source of error in the thermal discharge estimates? |
| In addition to being concerned about damage to the probes during freezing conditions, shouldn't we also be concerned that data collected during freezing conditions wouldn't be representative of the thermal discharge; that is, given that the frozen portion of the water would be disproportionately reduced in conductivity, leaving behind and enriched solution in the unfrozen portion of the water?. |
| Not clear how these results can be used by park to manage their geothermal resources. |

| Hydrologic and Water-Quality Impacts of Urban Development in Cedar Creek Watershed Upstream of Congaree National Park: A Paired Watershed Assessment | |
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| CATEGORY: Technical Assistance | PARK: Congaree National Park (CONG) |
| **USGS South Atlantic Water Science Center** | **COST: $ 50,226** |

Comments:

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| The proposal mentions the "observed effectiveness of remediation actions in Gills Creek," but doesn't tell what remedial actions were taken in (or are planned for) Gills Creek. |
| I'm having a hard time understanding exactly how this project will resolve the problem- more detail on specific data collection parameters & procedures, and final products would have been helpful. |
| Approach lacks detail particularly on analysis of existing QW data |
| Have past management efforts been successful in improving QW in Gills Creek? If so how will park be able to use these examples to effect land use changes in headwater areas. |
| Efforts to capitalize on, thoroughly vet, and expand its utility previous work was a plus. |
| Would have been helpful to give examples of existing data sets in both watersheds for comparison purposes. |
| No in-kind support other than USGS salary, which I did not include because I don't think it's fair to offices where base salary is not covered |
| The proposed work appears to be limited to comparing land-use data for the two watersheds and involves no water-quality sampling. The results are a hypothetical future for Congaree that doesn't include projecting the fate of the failing WWTPs or pig farming in the area, which are known current sources of bacterial contamination in Cedar Creek that have nothing to do with Gill Creek. |
| Many of the impairments identified are not directly related to QW ( flooding, loss of habitat, trash) |
| One of the letters of support mention concerns about an aquaculture facility that discharges water into Cedar Creek. It's unlikely that increased urbanization will result in an increase in farming and aquaculture discharge. Why not propose work to look more directly at the sources that are already known to affect Cedar Creek? |
| How do QW impairments pose threat to human health, there is some boating but I'm not sure how important this is to park |
| If the likely sources of sewage contaminants to Cedar Creek include failing wastewater treatment plants at Hopkins Elementary and Middle Schools, it's unclear how Gill Creek's land use works as an indicator of "future conditions" for Cedar Creek. Similarly, if farm runoff is a significant source of contaminants to Cedar Creek, wouldn't the more urban setting of Gill Creek show how water quality might be expected to improve rather than degrade, if Cedar Creek becomes more urban and less agricultural? |

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| The maps and figures are difficult to read, even when magnified. Hard to tell what you intend to show. |
| Which watershed management actions are being evaluated? |

| Baseline Water Quality at Herbert Hoover National Historical Site Prior to Flood Mitigation Retention Basin Construction | |
|---|---|
| CATEGORY: Technical Assistance | PARK: Herbert Hoover National Historical Site (HEHO) |
| **USGS Iowa Water Science Center** | **COST: $ 41,600** |

Comments:

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| The methodology for using discrete samples to verify the nutrient concentrations measured by the sensor is technically sound and cost-effective. |
| It may be a bit of a stretch to consider these methods "new technology", though high frequency sampling is certainly the right approach. |
| Providing a detailed map of park with sample locations and stream gage sites would have been helpful. |
| Retention ponds being constructed mainly to reduce bank erosion not to improve QW |
| QW does not seem like high priority for this park |
| Glad to see that your intended products will undergo robust technical review and approval. |
| This is more a physical hydrology issue and study in conjunction with the threat being to structures. A solid study but just not a good fit given the ranking criteria guidance. |
| I'm having a hard time understanding how the information collected by this project will help to improve water quality without addressing the described sources in the watershed. |
| There was no mention of the bacteria analytical method to be employed (IDEXX?) |
| Main issue is damage to structures caused by flooding and bank erosion which is why scores are low for 1-3 |

| Improving the Water Quality of Cub Creek: Using Real Time Continuous Data and Engaging the Next Generation | |
|---|---|
| CATEGORY: Technical Assistance | PARL: Homestead National Monument (HOME) |
| **USGS Nebraska Water Science Center** | **COST: $ 50,010** |

Comments:

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| Poor QW conditions have been previously documented , given the lack of management options for NPS I'm not sure extensive monitoring particularly real time data would be particularly useful |
| Map is of poor quality, hard to tell where stream flows through park |
| How much certainty do we have that the Volunteer methods used during the proposed study would be the same or comparable to the Volunteer methods used over the past several years? Did they keep good records of their procedures? |
| I'm having a hard time seeing how the project will validate previously collected VM data. Comparison of concurrently collected VM and USGS samples is great, but how do they plan to evaluate training, oversight, QA-QC etc. for past efforts? |
| Thanks for explaining how and when the data for continuous water-quality parameters will be reviewed and approved. |
| A straightforward and cost effective study which would contribute significantly to both increasing awareness of land use threats to water quality and to significantly strengthen the knowledge about the quality of the extensive volunteer monitoring. The item that could be stronger is problem resolution but the park or USGS has no control over that due to land ownership. If this study linked their data to some kind of upstream land use improvement study that would boost it but again not usually something NPS can initiate or control. |
| Risk to human health seems minimal given the short reach inside the park boundary and the lack of recreational opportunities |
| Thanks for explaining how and when the data for continuous water-quality parameters will be reviewed and approved. |

| Technical Assistance on the Development of a Public Education Kiosk and Website for the Thermal Springs of Hot Springs National Park, Hot Springs, Arkansas | |
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| **CATEGORY: Technical Assistance** | **PARK: Hot Springs National Park (HOSP)** |
| **USGS South Atlantic Water Science Center** | **COST: $ 50,000** |

Comments:

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| The proposed solution sounds a little old-fashioned to me. More people nowadays prefer being able to look up information on their cell phones than on a set of screens at the fixed-point kiosk. |
| It's unusual to frame the problem or "need" as a lack of an educated visitor base, but I think it works for this proposal. Still, I don't sense any urgency about the timing -- why now? |
| These types of proposals have struggled historically in the partnership due to ranking criteria. Overall this is a very solid proposal that addresses a significant issue to the park but I wish DOI had some sort of scientific outreach funding source to support USGS engagement in work like this. |

| Modern GIS-based mapper to improve groundwater and surface-water hazards and spill-response mitigation affecting Mammoth Cave National Park | |
|---|---|
| **CATEGORY: Technical Assistance** | **PARK: Mammoth Cave National Park (MACA)** |
| **USGS Indiana-Kentucky Water Science Center** | **COST: $ 50,000** |

Comments:

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| Project should do a good job of synthesizing existing data and info to enable better and more timely resource protection. Nice plan to try to "connect all the dots". |
| Well written proposal |
| If the GIS tool will be accessible from any computer, how will you handle security concerns, if any? Will the tool and its underlying datasets be made available to the public, or would you come up with some form of justification for limiting the distribution of the intended product? |
| No mention was made of any contaminant spill/release that has occurred in the subsurface watershed of Mammoth Cave that could be used as an example impact from contaminant migration via this pathway. Some examples from the CERCLIST would have been notable/useful for this area indicating what could occur in the future as well. |
| The section on spill response was weak. Would responses include targeted pumping to remove the contaminant, application of sorbent materials to soak up the contaminant, or other such measures? |
| Not only dye tracing, but are there actual spills demonstrating that contaminants have indeed moved through these underground conduits at detectable levels. |
| Consider showing the location of the Park in Kentucky for more spatial context. Fig. 1 is hard to read. It would be helpful to show the local topography so that it's possible to tell the direction of flow for the Green River and other surface waters. |
| Because this project involves modeling contaminant fate and transport, please be aware of the USGS requirements for archiving modeling products (http://water.usgs.gov/admin/memo/QW/qw2015.01.pdf). |
| Does the ICWater or RiverSpill tool developed by Samuels and others (2014) cover the Green River system and underlying caves? Or are you basing the proposed work (in a conceptual sense) on the ICWater or RiverSpill tool? |

| Expanding USGS Stream Gage 11264500 to Monitor Groundwater Data and Trends | |
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| **CATEGORY: Technical Assistance** | **PARK: Yosemite National Park (YOSE)** |
| **USGS California Water Science Center** | **COST: $ 46,111** |

Comments:

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| Good approach to couple surface and ground water measurements and take advantage of existing stream gaging network. Interactive component for park visitors is a nice addition. |
| No mention of infrastructure nearby or downstream from this site that would be impacted by any GW level rise & subsequent flooding. |
| Would be helpful to identify some of the aquatic life that would be affected by temperature changes. |
| Drought is identified as threat to GW resources but what is the tie to water quality? |
| What makes the Happy Isles site appropriate for this monitoring? Was it picked because of the existing streamgage there? Are there other sites that would have been better for meeting your stated objectives? |
| Scores were low for 1-4 because QW issue was not well established |
| If nutrients are of concern, the proposed work should have included an assessment of how nutrient concentrations change over various temperature regimes. |
| How does the proposed work connect to a water-quality problem or issue? I would have scored this proposal higher if some of the ecological questions that could be answered with the proposed data-collection effort had been posed within the proposal. |
| Downgraded due to weak linkage with any specific water quality issue, threat or resolution by this work. |