

CWAP NPS-USGS ASSESSMENT & MONITORING PROGRAM

NEW PROJECTS FY08

25 total

Panel Comments

CATEGORY: Intensive/Synoptic COST: \$300,000
REGION: Alaska PARK: Denali National Park and Preserve
PROJECT TITLE: Evaluate Water Quality of Streams Draining Abandoned and Reclaimed Mined Lands in the Kantishna Hills

COMMENTS:

- Consider methodological comparability of historic and planned trace metals determinations in both the water column and sediments, including filtration and sieving methods, true totals versus partial digestions, etc. Biological samples may need expediting to assure the results are available in year 2 to aid in picking sites for continuous tracer injection and synoptic sampling. Tracer choice for the injection experiments can be determined in part on back ground concentrations from historic and previous year's data. The proposal does not already describe how many tracer experiments will be done. Though a great application of the technique, these experiments are expensive, time consuming, and artful. If funded it would behoove the staff to overlap with Briant Kimball's group on an experiment and consider borrowing such gear and expertise to assure its cost effectiveness and success. Briant Kimball and Rob Runkel prepared and taught a course on the topic (including geochemical modeling using OTIS) and there may also be sets of their course notes available. The Surface water and Water Quality Modeling interest group has quite a bit of information on their www page, with much of it supplied by Ken Bencala. The proposal assumes that existing management practices are comprehensive enough to evaluate options for AMD treatment, however it would appear that use of limestone riprap for channel stabilization and natural attenuation are the only practices in place. If it is discovered that there are discrete sources of AMD emanating from off channel areas, there are a host of treatment alternatives that can be put in place prior to the discharge of the AMD to a perennial stream that would be of merit. Selection of treatment alternatives may also require geochemical modeling of the tracer test and other data—not sure this is in scope.
- Better define the in-kind contribution of the USGS research ecologist (BRD). Although helpful in clarifying the locations of previous reclamation efforts so that water quality and other sample locations can be selected, does not appear to comprise \$10K/year worth of assistance. This assistance should be limited to the first year, unless the ecologist is intended to participate in the interpretation of results? Clarify the extent to which up/downstream water quality sampling sites are to coincide with historical sampling locations (including the Cook Inlet NAWQA dataset to which this data is to be compared). Why not limit sample collection (water quality, algae, macroinvertebrates) to trained personnel as opposed to involving visiting scientists and (or) students associated with the Murie Science and Learning Center – maximize the quality of sample collection since an intensive one-time study. Under Environmental Planning Requirements, please clarify whether you anticipate a CE or EA. If the water quality of streams flowing from the Kantishna Hills can effect the water quality of Wonder Lake, that would be worth mentioning? Clarify the extent to which the tracer injection techniques have been successfully applied to other streams impacted by mining?
- Good use of historical data to address current and needed QW concerns.

- Proposal is expanded in scope from previous submittal and contains design changes that addressed previous comments. However, are six samples per site adequate for statistical analysis to characterize water quality in control and reclaim streams?
- The most significant issue in the park. Definitely important, but not overarching. Not a public health risk. No documentation of fish kill or human health impacts described. Problem only defined in general terms. No specific information on amounts and loads of contaminants during pre-reclamation phase. Although most of the technical aspects are routine, the tracer dilution proposal element is not well presented and it is unclear if the expertise and hydrologic conditions needed for tracer dilution experiments exist in the streams. The reference used in the proposal for the tracer dilution method is a fact sheet. This highlights the oversimplification of how this complicated technique will be applied. The actual stream reaches where tracer dilution tests will be done are not quantified. Study results will identify areas where additional reclamation is needed and if pre-project data are good, the success of past reclamation efforts. This study will not provide the final problem resolution. Technology and methods utilized in the project are not new. Will not enhance reclamation identification or reclamation in other Parks. The proposal is likely underfunded based on the information that is provided. The unquantified number of tracer dilution tests are both labor, equipment, and analytical intensive. Only \$29,000 of analytical and equipment costs are included during the corresponding budget year. This would likely only fund 1 or 2 tracer dilution stream reaches. 16 percent of project costs covered by in-kind contributions. Utilizes existing techniques that are applied to a problem that will be present at numerous parks.
- Denali NPS acquired several pre-existing acres of lands where waste from mines could cause surface soils to corrode on-site. In addition, two streams are on the 303d listed waterbodies. This demonstrates severity of resource threat to several resources. First year water-column samples are quite elevated and the overall project cost is too high (357K). USGS should lower cost by 10%.

CATEGORY: Fixed Station COST: \$150,000
REGION: Alaska PARK: Lake Clark National Park and Preserve
PROJECT TITLE: Water Quality Characteristics of Chulitna River

COMMENTS:

- Should mining developments be initiated in the watershed of the Chulitna, can monitoring at the Lake Clark ‘integrator’ site (and other sites) be required by the State of Alaska as part of a permitting process – i.e., can someone other than NPS be asked to provide the needed long-term monitoring? Please clarify. Provide additional information concerning possible tributary sampling locations indicated on Figure 2 – there are likely to be lots of options. Scope out accessibility of potential monitoring sites in the watershed upstream of the ‘integrator’ site prior to resubmittal to eliminate any question concerning their inclusion in the project. There doesn’t appear to be a one-to-one correspondence between the analyses to be performed at the integrator site (mouth of the Chulitna River) and upstream sites. No nutrients or suspended sediments at the upstream sites? A good fit to the funding source as a fixed station project/well-timed. Provide more detail on labor (who/how much time), since it comprises 64% of total project costs.
- The potential resource impact is very significant (world class salmon fisheries used by wildlife and humans). No information provided as to when the mine will be opened, if ever. Yes there are many claims staked, but when will actual mining begin. Seems to be more temporally pressing issues in other areas. Problem is clearly defined and will provide excellent pre-mining water quality data for the Park and associated resources. Project can be accomplished with existing techniques. Unclear whether standardized techniques for entering and correcting continuous monitoring data will be utilized (not referenced). Based on the information provided, eventually the baseline data will become important in assessing on-Park impacts from the future mining. At present, these data will not address a pressing environmental issue. Technology and statistical methods proposed for the project are not new. Will not enhance monitoring efforts in other Parks. Funding is adequate for proposed tasks. Budget details lacking. A little less than 20 percent of project costs covered by in-kind contributions. Utilizes existing techniques that are applied to a problem that will be present at numerous parks.
- The technical/scientific need to perform the tributary work outside the park unit is not well demonstrated. An alternative focus might be to add a biological component to the fixed site or do a limited limnological and lake bed sediment study near selected stream mouths that represent mineralized and/or mined and un-mineralized terrains. Can the continuous water-quality station be operated where a stable control exists such that a preliminary streamflow rating can be generated, as streamflow data may prove far superior to stage for trend purposes and is critical to computing loads, etc.
- Fairly well designed baseline monitoring project, but it is unclear how eminent the threat is to downstream park resources, and sampling logistics would make this monitoring very difficult.
- This type of monitoring should be a requirement for any upstream mine permits to be issued. More of a local issue than one for national scientific program funding.

- Park will have baseline data to compare to future data if the Pebble mine is developed. Location of the proposed mining may pose a treat to water quality and fish habitat. Collecting data pre-mining will not bring resolution to the problem but it will give NPS a case that mining is impacting Chulitna River & changes are needed. Study did not state a date for which mining could possibly start.

CATEGORY: Technical Assistance COST: \$20,000

REGION: Alaska PARK: Wrangell-St. Elias National Park and Preserve

PROJECT TITLE: Developing New Method of Estimating Stream Discharge

COMMENTS:

- Only a cursory water-quality significance. No current threat identified. How this problem relates to a significant water quality issue is really not addressed. Project is technically sound and can be accomplished with existing techniques. Will not resolve a pending QW problem, but will contribute to general knowledge of Park hydrology. Non-QW technique will contribute to other Parks. Funding is adequate for proposed tasks. Budget details lacking. About 39 percent of project provided by in-kind support. Utilizes existing techniques that are applied to a problem that will be present at numerous Parks.
- The concept is well described, however, it is doubtful that a robust standard method could emerge from the work as it is currently scoped. Additionally, at least one peer reviewed product would be needed to document the method for it is used here or elsewhere. Too little water quality to make it as a technical assistance project within the WQP. The investigators may wish to consider submission of the proposal for potential funding by the USGS Instrumentation Committee (ICOM).
- This is more of a water discharge issue with a veneer of water quality justification.
- This is a nice proposal but it does not relate to water quality. The temperature component is an add-on, and no field activities associated with gathering data for the slope-area model are described in the proposal.
- Park wants alternate method for measuring stream discharge and only mentions assessing streamwater & aquatic ecosystem in abstract only. Study appears to focus on a slope discharge model using existing data for smaller streams. Under project support, study states that USGS is very interested in supporting these types of hydrological modeling. This clearly identifies the objective of study. In addition, under cost effectiveness study states most of data for model development already exist. In budget breakdown, study never mentions cost of proposed pressure transducers and other than abstract never mentions proposed pressure transducers in any other sections of the study. Study should be forwarded to I&M Program or NRPP Funding for hydrological monitoring study.
- Tangentially related to water quality. Clarify to what degree the gaged sites (outside the park) correspond to streams within the park in terms of stream type and the applicability of Manning's rough coefficients estimated from the former. Since the slope-area method of estimating discharge is an existing methodology, please clarify in what ways this project would expand on the application of the techniques? Has the slope-area method been previously applied to braided channels? If not, emphasize. With respect to 'single-thread' channels, there wouldn't be anything unique about those in AK from those in many lower-48 locations. Clarify to what extent eutrophication has been an issue in Wrangell- St Elias? Collection of water temperature data with

transducer/logger not innovative. Clarify whether there are any gaging stations in the park – says no in one place and implies yes in another. Clarify the likelihood of locating USGS gaging stations for validation of Manning’s roughness coefficients – similar substrate, etc to stations used to estimate n 's. Clarify the impact of changes in the cross-sections of braided channels on the applicability of the slope-area method. If the cross-section changes, then R changes – right?

CATEGORY: Intensive/Synoptic COST: \$260,000
REGION: Intermountain PARK: Big Bend National Park
PROJECT TITLE: The Relation of Water Quality, Available Habitat, and Biological Integrity to Periods of Low Flow in the Rio Grande

COMMENTS:

- More of a data collection exercise than an investigation.
- Good evaluation of water quality and aquatic biology related to flow conditions, but not clear how many water quality samples will be collected and how sampling results will be tied to a specific issue. Probably better suited as a baseline study.
- USGS personnel cost & lab cost quite high. Study failed to define problem vs resolution to problem through water quality sampling & stream-flow monitoring low flows. In addition, will the park have low flows upon start to finish of study?
- Low flows and elimination of endangered fish and riparian habitat could impact the Park experience. Increased water demand driven by population growth will increase the severity of this problem in the future. Combines flow-weighted water quality with aquatic biota monitoring. Impacts to endangered species have been documented. Project is technically sound and can be accomplished with existing techniques. Will not solve the problem, but will begin to provide an understanding of the impacts of low flow conditions on the water quality and biota utilizing this area of the Park. Utilizes existing techniques. Funding is mostly adequate for proposed tasks; however, the operation of the continuous monitors is likely under-funded. About 2 percent of project provided by in-kind support. Methods could apply to other sections of the river outside of the Park's boundary.
- Describe the repeatability of macroinvertebrate samples and why, given the variability of such samples, you believe you will be able to discern changes in macroinvertebrate populations over a range of low flows in the spring/summer of Year 2? Describe what thresholds will be used to select high and lower flow conditions for sampling? As a practical matter, are you planning to schedule sample collections at times of historically high and low flows or use real-time data from gaging stations as a trigger? Consider revising as a Fixed Station proposal, focusing on temporal/discharge-related changes in basic parameters (e.g., water temperature, DO). Might be much more competitive since (as currently presented) was interpreted as data collection as opposed to an intensive interpretative study.
- The problem seems to be there is not enough flow to sustain the integrity of aquatic biota—water quality issues appear secondary. The focus on critical refugia of which I like the continuous water quality monitoring and would consider addition of water column chlorophyll-a and BOD work. Are trace element and OC and current use pesticide data critical to the question at hand. Their inclusion drive up analytical costs and most probably field costs as well. Some minor mention of effluent loadings, may leave it open to evaluate wastewater constituents, but this is not in the current scope of work. Is the fixed sampling to be done at sites near the upstream and downstream end of the park? Is there a technical justification for choosing these locations?

CATEGORY: Intensive/Synoptic COST: \$300,000
REGION: Intermountain PARK: Curecanti National Recreation Area
PROJECT TITLE: Determine the Trophic State of Blue Mesa Reservoir and the Effects
of Aspinall Unit Reoperation

COMMENTS:

- Unclear on the total responsibility of the NPS with respect to fisheries in the reservoir. Unclear how the large amount of in-kind support will actually be provided. Unclear that the investigators have enough limnological expertise to design and execute the proposed study.
- Does not make a compelling case for the need for a USGS investigation over what appears to be application of a standard management tool by BOR, NPS and State agencies. NPS in-kind contribution % is not described or detailed.
- Clarify the necessity for training of the modeler in the use of the mode (\$2K, CE-QUAL-WQ training)? Clarify the responsibility of NPS to manage this non-native fishery versus the BOR? Clarify how sample collection/lab analyses were planned/budgeted given that Step 1 is to assess data gaps for model construction/calibration? Clarify how data collection can continue into Year 3 (Time Table section). Under Description of Action, #5, you suggest that USGS will work with BOR and the State of Colorado to reach consensus concerning how to protect the natural/economic resources of CURE – this is clearly the domain of the park/NPS. Clarify why existing data are not sufficient to construct/calibrate at least a preliminary CE-QUAL-WQ model? Clarify whether or not the BOR has already constructed such a model for Blue Mesa Reservoir? Please justify full salaries for 3 NPS staff (+ supplies and materials) as in-kind-support for this project.
- Study is not well defined, not enough time to collect data and develop a model. May fit better under NRPP.
- The NPS will need such a model to evaluate effects of operational changes on reservoir trophic conditions. The CE-QUAL-W2 model has numerous rate parameters for various chemical, biological and physical processes that need to be estimated from field data that are not addressed directly in the proposal (the field activities appear limited to collecting field parameters and nutrients at seven sites x 4). Without other associated work, it is doubtful whether the project could deliver a fully calibrated model that would behave well in extending it past initial conditions to those of various re-operation scenarios. The model itself does not provide critical information for projecting changes food web dynamics or fish communities—this would have to be extrapolated by some other means.
- Proposal is only slightly revised from previous submittal and is not clear about project activities to be conducted and data requirements for the model. Not enough information in the proposal to evaluate what will be done and why it is necessary.

CATEGORY: Intensive/Synoptic COST: \$172,100
REGION: Intermountain PARK: Rocky Mountain National Park
PROJECT TITLE: Effects of Nitrogen Limitation and Biological Characteristics of High-Elevation Lakes

COMMENTS:

- It is a well thought out proposal and could provide some very interesting results on similarity/difference in past and current biological assemblages based on differences in nutrient loading and hydrologic variability. It is very possible that there will be time lags or a hysteretic response to reducing nitrogen inputs that could frustrate progress—is this accounted for in the modeling or provided an uncertainty in developing critical loads
- Great project with significant issues and concerns in regards to adverse impact and critical loads relating to air pollution. Not enough water samples & water analyses, if the study assessed more species and soils impacted by atmospheric deposition of inorganic nitrogen (N) it would fit the WRD fun source (water quality) a little better but it is a well written study with significant issues and threats to resources (both air and water).
- Federally listed aquatic species in the Park lakes are extremely important. ROMO has one of the largest amounts of atmospheric deposition in the Western United States. These loading rates are likely changing the biological characteristics of these high elevation lakes. It is unclear on how fast this transformation from increased nutrient loading may occur. Previous work in the Loch Vale watershed has documented that the increased nutrient loads to the watershed has already impacted the lake ecosystems. Additional information on the spatial extent of N loading is required before a Park-wide standard related to critical N loads can be established. Objectives are clear and concise. Time frames are reasonable. Additional data collected and interpreted during this study will provide additional science support for setting a “defensible” critical load number with respect to nitrogen deposition. It is likely that the work on setting critical load limits for N will continue with regulatory agencies even if this project is not funded. The combination of techniques assembled for this project will be transferable to other Parks, as evidenced by the proposal from the North Coast Cascades for FY 08. Most travel does not involve overnight stays, increasing the cost effectiveness of the study. In addition, some infrastructure and samples exist from previous/ongoing studies. Based on the proposal a high percent of funding will be provided by outside sources; however, some of the in-kind contributions do not seem to be directly related to the proposed project. Some innovative approaches that will be applicable to other Parks in the Western United States.
- Good proposal, but somewhat similar to study funded in FY07-09 related to critical loads. However, current study also looks at diatoms. Proposal should show connection to on-going work.
- Fills an important ecological indicator gap in the ROMO N deposition research program. High scientific merit – less so for severity of problem and significance of resource.

- Clarify the need for an alternative estimate of critical load for ROMN lakes (as opposed to other aspects of the proposed study) in light of previous work. Only work performed for the study at hand should be counted as in-kind support? This would not include ongoing operation of the two NADP stations (\$30K), the Rocky Mountain Snowpack Network (\$12K), or USGS Resin Collector study (\$50K). Clarify any directly observable changes (impacts to) ROMN lakes in relation to documented nitrogen saturation, as opposed to nitrogen levels themselves.

CATEGORY: Fixed Station COST: \$100,000
REGION: Intermountain PARK: Yellowstone National Park
PROJECT TITLE: Continuous Chloride Measurement as an Indicator of Geothermal and Volcanic Hazards

COMMENTS:

- Great project with direct problem resolution. Park request funding for chloride analyzers to monitor fluctuations in chloride real-time and evaluate real-time chloride flux data. Real time data will provide early warning of potential geothermal hazards, which will give park managers time to handle visitors to the park etc.
- The measurement of chloride and/or salinity fluxes has been done by various methods for a couple of decades and is thought to aid in understanding geothermal hazards. The proposed work would allow such data to be generated, transmitted and used in real time for operational aspects of hazards notification and mitigation, however, it is NOT developed as a water quality question or problem. I do think the capability could be used for water quality studies, however. I would encourage the scientists to consider the relative benefits of the experimental chloride sensing instrumentation with that of a more spatially elaborate network of much cheaper and easier to use specific conductance probes. Additionally, application of a Neural Networks model to estimate chloride concentrations and loads from continuous specific conductance and flow data and periodic major ion measurements. The resulting Neural Networks model may prove even more valuable in an operational mode where it is run continuously for purposes of event notification. Paul Conrads in the SC WSC, is an experienced user of Neural Networks models, and could be a very productive collaborator on such a project.
- Proposal describes a sound program of monitoring that will benefit the park; however, it does not discuss how these data will be analyzed or how chloride flux could be used as an early warning of geothermal activity (practical application specifics). In addition, no budget is provided in the proposal for data management and a final report.
- High scientific merit and product deliverable for a data collection project
- Clarify the need for determining concentrations of anions in addition to chloride, major cations, and alkalinity? Clarify project timeline in text. Clarify time commitments for the park hydrologist – 4 pay periods/yr (~17% of available time) to collect weekly to biweekly water samples from these two locations (+ prep/shipping to lab)? Clarify if the new in-situ chloride analyzers have already been built. If not, then provide information supporting the estimated \$6K cost to construct (per unit). Clarify who will be performing maintenance on the in-situ analyzers in case of unanticipated issues related to their deployment in the field.
- The thermal features are the most or one of the most important resources in the Park. Absolutely one of the key features in the Park. Explosive thermal events in the park (24 in the past 126 years) are a real and present danger to citizens utilizing the Park. Delaying the project will not impact the thermal resource, but could damage the human resource viewing them. Extensive background information on chloride concentrations associated with selected monitoring sites in the Park is

available. The sample frequency of this historic data need to be increased to support the development of a real-time hazard system. If this initial work is successful, a real-time hazard system can be implemented throughout the Park. Ion-specific electrodes do not have the long-term monitoring capability of the method proposed. In addition, the new instrumentation has already been developed and can be easily tested and integrated into a real-time monitoring network. If successful, this equipment will provide an early warning system for thermal features in the Park. Because of the low cost of these prototype units (\$3,000/ea) it is feasible put these in numerous locations that may be of concern. If this technology demonstration proves successful, there will be high transfer potential to other parks containing thermal features that may pose short term hazardous periods to the public. Costs are reasonable. Most of the analysis will be conducted in USGS research laboratories, reducing the need for higher cost service laboratories. Based on the proposal a high percent of funding will be provided by outside sources; however, some of the in-kind contributions do not seem to be directly related to the proposed project. An excellent example of applying new technology in combination with existing infrastructure (real-time gaging network) to provide a cost effective hazard warning system. If possible, a third year (phase 2) should be added to the study to actually implement a real time pilot system with pagers or other communication devices that would update key Park personnel.

CATEGORY: Technical Assistance COST: \$19,700
REGION: Intermountain PARK: Curecanti National Recreation Area
PROJECT TITLE: Quality Assurance and Publication of NPS Water-Quality Data

COMMENTS:

- Significant issue or concern. But, should this be under the water quality fund source?
- The bulk of the project objectives could be accomplished by Park Service personnel attending a USGS 2-week class in water-quality sample-collection techniques. This would likely be more a more cost effective approach.
- Clarify cost of training NPS staff in budget section. If NPS staff were trained by USGS personnel to collect/preserve water quality samples as part of a previous project, please describe the results of that effort. Specifically, how much turn-over occurred in trained-NPS staff (i.e., is there likely to be a long-term benefit)? Also, would it be more cost-effective for NPS staff to attend a USGS short-course on water quality sample collection/preservation, rather than be trained on-site? Since water quality data must be reviewed/entered into NWIS by USGS personnel and there is an ongoing need for the collection of water quality data at the park (by NPS staff), provisions should be made to include this cost in the park budget. Clarify in-kind support directly related to the completion of the proposed training/data processing effort.
- This proposal is identical to the study that was funded in FY01-03 at the park. The partnership program is not designed to fund the same park need on a continuing basis.
- The park staff should ultimately aim for (1) self sufficiency on the part of the park to complete the data management and publication of such data, or (2) a continuous partnership with the CO WSC to work along side the park in qa/qc and publication.
- Task of data transference to NWIS is not a good fit for Partnership Program objectives.

CATEGORY: Intensive/Synoptic COST: \$284,200
REGION: Midwest PARK: Voyageurs National Park
PROJECT TITLE: Nutrient Cycling and Relation to Changes in Water Levels for Kabetogama Lake

COMMENTS:

- Clarify why sediment samples are to be collected at two more sites than water quality samples (Lost Bay & Site #9). Provide more detail on in-kind support. Counting park administrative staff time a stretch.
- Around 50 percent of the Park is water covered; hence, preservation of water clarity and function is essential to the function. Existing evidence indicate that nutrients, primarily re-release of phosphorus, may be an important factor impacting the water quality of selected lakes in the Park. Overprinting this concern is the revisiting of water-quality standards by the Joint Commission in 2015. Project objectives and approach well defined and methods exist to conduct the study. Existing data bases from previous studies should be used to assist with data interpretation and impacts resulting from the rule changes. It is unclear from the proposal if the historic data measured sufficient nutrient and other chemical constituents to document historic changes. Objectives and methods are feasible. Results from this study will allow for insight into the impact of the rule change by the IJC and for the revisiting this same issue in 2015. Standard techniques are being utilized in the project and these are available to other projects. Good detail provided in proposed budget. About 13 percent of the total budget will come from “in-kind” services. Combination of methods proposed provides a reliable method for nutrient cycling, especially with respect to sediment re-suspension (P cycling).
- Good, well written proposal evaluating nutrient loading in a shallow lake with polymictic circulation.
- Project staff should be very cognizant of field and laboratory methodological issues with generating a coherent set of data to compare to historic datasets collected by various parties—this includes some nutrient species data collected from water column and bed sediment and even more so chlorophyll a data. Any release work from cores and supernatant will have to be done with strict control of conditions to minimize oxygenation and alteration/disturbance of the surficial sediments. It may be worthwhile to have park staff do vertical profiling of critical areas of the lake prior to and following a period or two of heavy boat traffic and also passage of weather systems that may induce lake seiche, in order to evaluate conditions that can lead to lake turnover and increased phosphorus availability.

CATEGORY: Fixed Station COST: \$150,000
REGION: Midwest PARK: Saint Croix National Scenic
Riverway
PROJECT TITLE: Monitor Progress toward Nutrient Reduction Goals at Norway Point
near Grantsburg

COMMENTS:

- Accomplishments of objectives will likely require more years of load estimation than the program will provide. If funded – plans should be made for resources to support additional sampling beyond year three.
- Could benefit from a little better coverage of high flow periods or at a minimum a comparable data density to that of the downstream sites to develop similar levels of confidence around the load estimates. Will the site be operated as a normal stream gage and records estimated for the period where it was operated as a stage only gage. Note that LOADEST is the loads computation program that if fully documented and supported by the USGS WRD—not ESTIMATOR or FLUX.
- Protecting the quality of water in the riverway is one of the fundamental purposes of the park. A watershed goal is to reduce P loading by 20 percent by 2020. Increasing nutrients and the impacts on Park water quality, clarity, etc... is a big concern. Monitoring efforts to document the goal of a 20 percent reduction in P loading is important. Delaying the project will not have an immediate impact to the Park. Project objectives and approach well defined and methods exist to conduct the study. Regression model included in proposal to estimate nutrient loads in outdated and should be replaced with a newer package. Unclear as to why grab vs. EWI or EDI samples are collected for nutrient analysis. Explanation as to why grab samples were justified should be included. The proposed project is directly addressing an ongoing management issue (the reduction of nutrient loads in the watershed). The proposal will only address the initial monitoring. Additional monitoring until 2020 will have to be conducted as well. Data will be made available in real time as well as published reports. It is unclear how real-time nutrient data will be made available without sufficient data to construct a regression model. Costs are reasonable. Gage costs about 50 percent of the National average; however, this is due to another Federal agency operating the gage. USGS gage costs are for the equipment to upgrade the station to real time. Some of the in-kind contributions listed in the proposal do not appear to be directly related to the project. Combination of methods proposed provides a reliable method for measuring nutrients loads for use in future documentation of a 20 percent load reduction by 2020.
- Clarify whether water quality samples are to be collected monthly or every 6 weeks with discharge measurements. I&M Network water quality samples will be analyzed for what (explain how they will complement water quality sampling performed as part of this project). The citation for ESTIMATOR dates to 1989. Is this the best choice of regression programs for calculating loads at this point? How about FLUX? Compared to other rivers in the region, is a 2-fold increase in P loading and 5-fold increase in diatom biomass since European settlement high? Clarify to strengthen argument for urgency. Labor costs to collect grab samples seems high. Readily accessible by road? Not remote.

- Good info. data from stream-flow and water quality monitoring will give monthly and annual loads for phosphorus and nitrogen to be estimated with a regression approach. Study mentioned on page 3 under approach and methods that NPS Great Lakes Inventory and Monitoring Network would collect monthly water samples which would complement this study. This study appears to be an I&M study that could be combined with I&M program.
- A large portion of project budget is for operation and maintenance of the stream gage. No funding in the proposal budget is allocated for a final report.

CATEGORY: Technical Assistance COST: \$20,000
REGION: Midwest PARK: Indiana Dunes National Lakeshore
PROJECT TITLE: Identify Filtration Pond Backwash Seepage Affect on Long Lake Watershed

COMMENTS:

- Good add-on to previous study funded in FY01-03, but issue should have been addressed in first study. Are general water quality results appropriate tracers for filter backflush seepage?
- Study will identify whether indicators of filter backflush seepage are present in groundwater & surfacewater.
- The lake is one of the most visited features in the park and supports a number of T and E species. Unfortunate that the proposal could not provide a table of previous chemical analyses of water samples from the back flush pond. Based on general information provided in the proposal, the back flush pond represents a water-quality threat. Given the close proximity of the back flush pond to the park, it appears there is a > 99.9 percent chance of impacts to the lake. Proposal is making this too complicated. Confirmation of discharge to park lake could likely be made without groundwater wells. End-member sampling for conservative natural tracers would likely be a good start. Not confident that this is the most cost effective method to approach the problem. Funding for this project might be better spent in developing a remediation strategy for this very likely problem. Data will be made available. Proposed actions may be more than needed to address the problem. About 14.5 percent in-kind support is provided. Basic water information will be provided.
- Suggest sampling the sludge pond and also ground water seepage to the lake that is not thought to be influenced by the pond. Consider inclusion of deuterium and oxygen isotopes as an independent verification of the ground water flow path and as a possible tracer for establishing a mixing model. Even ground water temperatures may be a useful tracer if the residence time is short and you can target a period when there is a large contrast between air temperatures and average ground water temperatures. There is no report planned for this portion of the project, so the story will have to emerge directly from the data.
- Clarify ‘Long Lake is an important legal indicator...’. Collect one less groundwater sample for analysis and characterize a sample from the impoundment itself. Could be helpful in targeting analyses for the groundwater and lake water sample + demonstrate more conclusively that contaminants identified in the latter originated in the impoundment. Arrangements to collect this sample should be made with the WWTP to strengthen the proposal prior to resubmitting. Clarify – Is the level of backwash in the impoundment always higher than the lake level? If not, including a sample of the backwash impoundment contents would be particularly important since there would be periods when contaminated lake water (numerous other sources) flows from the lake toward the impoundment. You suggest that six well points will be installed, yet limit groundwater level measurements (essentially no time/effort) to 5?

CATEGORY: Intensive/Synoptic COST: \$300,000
REGION: National Capital PARK: National Capital Parks East
PROJECT TITLE: Nutrient Cycling and the Effects of Geese in Natural and Reconstructed Wetlands in Kenilworth, Kingman and the Fringe Marsh Areas

COMMENTS:

- Decent proposal, but it will be a challenge to separate geese impacts from other urban impacts in the study. How large is the geese population and nutrient input in the wetlands?
- I'm concerned that lack of a good understanding of the hydrologic flow paths and water budgets of the subject wetlands will impede our ability to understand water quality processes and effects. The surface water quality work is infrequent and synoptic in nature—it can only suggest controlling factors, but probably not rates or effects on nutrient mass balance or a quantitative comparison between reference wetlands and constructed or goose affected wetlands. The proposed ground water and pore water work is rather intensive, however, it is presented without a clear conceptual model of hydrologic flow paths and ultimate nutrient sources. The use of isotopes to discern loadings from goose guano is of interest, however, it would appear problematic to evaluate given differing upland feeding areas of resident goose populations (intensively managed lawns and landscapes, agricultural land, largely unmanaged park land, etc.) and resulting range of isotopic signatures and feeding from within the subject wetland or other wetland areas. I think we can assume rather little on what isotopic mixing member(s) would result from such varied forage areas, but this is also where there could be the biggest scientific contribution. If the review fears regarding insufficient hydrologic understanding of the wetlands cannot be satisfied easily as part of a re-submittal, it may be appropriate however, to focus just on some isotopic and nutrient loading rates for geese as a stepping stone to more broad use.
- Study deals with enhancing wetland restoration to assist in removing high nutrient levels. We understand that results are transferable to other studies dealing with bird populations but you should discuss other ways of transferring data.
- In the event that ^{15}N cannot be used to quantify the contribution of goose guano to N-loading, this is still a valuable project in terms of evaluating uptake of nutrients by restored wetlands. Consider focusing the title text/objectives more on the latter and quantifying the impact of goose guano as a value added.
- This proposal could have benefited from the formulation of testable hypotheses. As written it is a data collection exercise with very non-specific objectives to “evaluate” nutrient status and cycling.
- Hard to understand how this project will come together. Lots of information being collected but only limited information on how it would be used to address the problem. Hard to envision that the goose waste would have a unique isotopic signature given multiple feeding sources and post depositional fractionation.

CATEGORY: Fixed Station COST: \$150,000
REGION: National Capital PARK: Rock Creek Park
PROJECT TITLE: Continuous Water-Quality Monitoring

COMMENTS:

- The project has primarily educational benefits, rather than to provide science to improve park resources management. Is there interest in operating this long term? Please, note the referenced continuous monitor guidelines in the proposal have been superceded. It would appear that the related proposal could be funded through existing funds within this proposal and older computer hardware that has been taken out of service by the MDDEDC WSC NPS office or even the USGS Reston, VA office. Will the park or a cooperator commit to long-term operation?
- The proposal is similar to one that was submitted last year. It was modified and improved with the addition of a new partner, but still no report is planned for this project. Again, the monitoring project should be combined with the display project.
- Strengthen argument for need (other than educational) for the basic water quality data from a natural resource management point of view.
- A very expensive continuous monitoring site, especially since the gage is being paid out of another project. If the companion project is not funded, then the continuous monitoring data collected during this effort would have little use.
- A good proposal for an interesting and valuable product – that simply does not score well given the rating criteria for this program.

CATEGORY: Technical Assistance COST: \$20,000

REGION: National Capital PARK: Rock Creek Park

PROJECT TITLE: Public Display of Water Quality and Flow Data

COMMENTS:

- The proposal would have benefited from a schematic diagram showing the details of the display. Without linking the continuous field parameter results to a biological application, the public will have little interest.
- Should be combined with other Rock Creek proposal to strengthen both.
- Project is centered around upgrading current USGS water-quality monitoring station for purposes of presenting information as display at the park. Upgrades could possibly funded through NPS-fee demo fund source. In addition, If the project was centered around water-quality for purposes such as resource management needing to understand a given issue at hand it would then be a winning proposal.
- This should be done with existing resources and within the scope of work of the Rock Creek Fixed station monitoring proposal.
- No significant changes were made to the proposal submitted last year. The display project should be part of the monitoring project. Also, no approval letter from the park Superintendent was submitted for either Rock Creek project.
- A good proposal for an interesting and valuable outreach product – that simply does not score well given the rating criteria for this program.

CATEGORY: Intensive/Synoptic COST: \$299,800
REGION: Northeast PARK: Fire Island National Seashore
PROJECT TITLE: Characterizing Submarine Groundwater Discharge to Great South Bay

COMMENTS:

- Well thought out proposal that will use multiple methods to confirm the study results.
- High scientific merit and relevance to NPS resource protection issues, excellent interdisciplinary and interagency coordination and cost-share.
- An ambitious project, but with proven techniques, USGS researchers and an impressive set of collaborators. Not sure how or if hydrologic and water quality data will be captured in USGS or ultimately NPS databases, but a data report is planned as one of the deliverables.
- A strong and well supported technical proposal that will have high transfer value to other Parks. Sound coupling of cutting edge geochemical and geophysical methods that will include resistivity surveys, noble gases, and real-time radon monitoring. Good application of new technology to addressing a pressing park problem. Coupled nicely with previous and ongoing studies and good fund leveraging. Hard for the typical USGS science center to compare with a study team that does not require salary.
- Provide rationale for not performing electrical resistivity surveys on a grid that effectively covers the Bay (area between Long Island and Fire Island) given the difficulty in anticipating how far off-shore groundwater discharge is occurring. Clarify whether the existing groundwater flow model has been used (or will be used) to estimate subsurface nutrient fluxes to the Bay (in conjunction with nutrient concentrations measured in shallow on-shore wells).

CATEGORY: Fixed Station COST: \$50,000
REGION: Northeast PARK: Delaware Water Gap National
Recreation Area
PROJECT TITLE: Determine Suitability of Using Surrogate Parameters for Predicting
Bacterial Contamination of Delaware River

COMMENTS:

- If minimizing beach closures is a high priority for the park, consider a rapid methods (albeit expensive) as an alternative to a surrogate parameter.
- The project would do well to generate a single coherent dataset of E coli and ancillary data to explore current relations. It is unclear what unique role the USGS brings to the table in this regard—it may be best packaged as a technical assistance grant in guiding the park in their data collection and statistically evaluating the resulting data.
- Is the park ready to rely on a surrogate parameter to deem a water body safe or unsafe based on bacterial conditions. Technically sound approach; however, surrogate approach may not be the best approach.
- Project should consider using rapid methods for analysis of E. coli. The park has a well supported monitoring program, and they could develop correlations between indicator bacteria species and surrogate parameters (turbidity and flow) on their own.
- Project is centered around locating a method to provide public awareness of bacterial contamination using surrogate parameters. Fee demo fund source could possibly work for this study.

CATEGORY: Technical Assistance COST: \$20,000
REGION: Northeast PARK: Shenandoah National Park
PROJECT TITLE: Assessing *E. coli* Concentration in Wastewater Treatment Plant Effluent

COMMENTS:

- Limited bacteria sampling is out of context in the proposal and won't determine whether there is a problem or resolve the issue. The park should determine if their WWTPs are in compliance with permit requirements on their own, and they should do it on a regular basis.
- The problem being addressed in this proposal is a WWTP operational problem that is then subsequently impacting the Park. Background data in the proposal indicates that Park WWTPs are likely not operating properly and need to be fixed. This operational monitoring of Park WWTPs could likely be addressed outside of the USGS/NPS program.
- Should be addressed by WWTP staff as a WWTP operations issue. Process failures are not limited to disinfection, although the latter is easily fixed.
- The project lacks scientific merit and a water resources perspective—this was lost in turning it into a technical assistance proposal.

CATEGORY: Intensive/Synoptic COST: \$300,000
REGION: Pacific West PARK: Mount Rainier National Park
PROJECT TITLE: Developing Critical Loads for Atmospheric Deposition of Inorganic Nitrogen in Network Lakes

COMMENTS:

- Concerned over length of exposure of bulk precipitation samplers. Stability of sample – microbial degradation and sample contamination.
- Great project – building on work at Rocky Mountain NP and timely.
- It is unclear whether 3 to 4 intensively studied ‘sentinel’ lakes will provide the scientific insight needed to understand lake responses relative to a range of intrinsic vulnerabilities that exist as well as a range in external loadings, however, it is a good first project for the area and an ambitious field and publications effort. The turnaround time on biological taxonomy and core analyses may be slow relative to your current time line, which shows some of this work in the final year. The work may have to be expedited in order to be used in the analysis and to complete the reports on time.
- The proposal is similar to the partnership study at ROMO related to critical loads and diatoms with mostly bulk precipitation monitoring. It is an ambitious project and I question whether all the proposed work can be done successfully. Also, there is no budget for a final report.
- Water features of the park are important. Increased nutrient loading coupled with climate change could significantly impact the water features of the park. Current nutrient loadings are not at the levels found in ROMO, but appear to be on the increase relative to pre-industrial baseline conditions. Now is the ideal time to being defining and monitoring the nutrient loads. Atmospheric nutrient loading to high-elevation lakes is a known problem that has been extensively studied at ROMO. By know the loadings and transport, Park managers in combination with State and Federal regulators will be best prepared to implement emission control measures. Project will emulate proven techniques in ROMO. Project results will provide managers with information needed to justify reductions in N loads to Parks in Washington, as well as other areas in the northwest. Data will be made available; however, no specific budget line items for planned reports. Some costs may be too low for planned tasks (i.e. no planned report costs). Project support: Limited in-kind support. Project will provide high quality data for critical management decisions for the Park and surrounding areas.

CATEGORY: Intensive/Synoptic COST: \$289,700
REGION: Pacific West PARK: North Cascades National Park
PROJECT TITLE: Effects of Glacial Retreat on Stream Temperature

COMMENTS:

- Although this is an important issue to the park, there is little that the park can do to mitigate the potential problem. More of a longer term threat. Background data did not show significant changes in stream temperatures with receding glaciers. Likely a step function. Problem clearly defined. Information from project will likely not develop a solution. Project will utilize existing methods to monitor water temperature and model future changes. A final resolution to the problem will not be developed by this project due to the global nature of climate change. Methods and approach will be transferable to numerous other parks with active deglaciation. Generalized budget provided. Limited in-kind support. Project will provide high quality data for the current and projected impacts of climate change to glacier fed streams within the Park.
- The proposal assumes but doesn't demonstrate that glacial retreat directly influences declines in flow and changes in stream temperature, and therefore is more a research investigation.
- The project is primarily concerned with ecological flows and climate change. Can we be confident of the model extrapolations through time without consideration of how the snow and glacial pack mediate air temperatures and creation of microclimates? Would a linked air circulation/climate model be needed???? Within a given ecosystem/region do we already see different aquatic communities in glaciated and unglaciated systems that might provide the same insights. Maybe this space/time substitution is enough to form our hypotheses.
- Study concentrates on effects of glacial melt on stream temperature, monitoring data to identify stream system that may be a future risk. Study is not a significant issue at this time.
- Limited to temperature – no examination of other water quality or biological parameter changes.
- Stress the usefulness of this information in interpreting the results of long-term 'vital signs' monitoring by the NPS Inventory & Monitoring Program. Without this information, it may be difficult to interpret long-term changes in stream ecology in these two parks.

CATEGORY: Intensive/Synoptic COST: \$300,000

REGION: Pacific West PARK: Yosemite National Park

PROJECT TITLE: Occurrence and Distribution of Current-Use Pesticides in Atmospheric Deposition

COMMENTS:

- Great study, need to beef up problem resolution section of study.
- Can we assess the sampling rates of the various passive samplers for the pesticides of interest to back out a time averaged concentration. How well do the target pesticides and associated metabolites line up with pesticide usage in the Central Valley—are there important gaps that would limit our ability to evaluate effects? Were staff in the CA WSC given a chance to collaborate on this project? Mike Majewski in particular would be a knowledgeable collaborator, given his extensive research in pesticides in air and his past work in the Central Valley and elsewhere in California.
- Excellent proposal – however a remaining data gap would be relating the concentrations of pesticides in water and tissue to established concentrations for adverse affects. It will be difficult to conclude that the levels found contribute to the declines without such a linkage.
- Stress impacts to reptiles in addition to frogs to strengthen urgency. Clarify the magnitude (significance) of agricultural pesticides documented in amphibian tissue in the park.
- The proposal is similar to the study at GLAC and ROMO in FY02-04. It is not clear whether pesticides caused the frogs decline.
- Pesticide impact to amphibians and other biota in the park is of concern, especially because of the proximity to the Central Valley. Amphibians die offs in this and other parks is severe. Information that possibly addresses the reason for these die offs is needed soon. The proposed work will begin to address possible contaminants and processes that may have contributed to amphibian decreases within the park boundary. Project will utilize existing and newly developed methods to assess the extent of pesticide deposition within the Park. Modeling approaches (back trajectory analyses) and semi-permeable sampling devices will be used to identify pesticide sources and determine their concentration in water after deposition. A final resolution to the problem will not be developed by this project; however, adequate data will be collected to determine if a problem exists. Methods and approach will be transferable to numerous other parks with amphibian die offs and potential impacts from pesticide deposition. Detailed budget provided. Cost effectiveness of the project could potentially be increased by utilizing technician assistance from field offices in the California Water Science Center. Project support: 25 % in-kind support will be provided by the Park. New analytical techniques for pesticide analysis will be utilized.

CATEGORY: Fixed Station COST: \$148,000
REGION: Pacific West PARK: Olympic National Park
PROJECT TITLE: Near shore Effects of Residential Wastewater-Influenced Groundwater on Lake Crescent

COMMENTS:

- Nutrient input from aging septic systems is impacting park spawning beds. Delay in the project could impact the spawning beds. Analytical budget is under-funded if the more expensive natural tracers are selected for analysis (tritium/helium).
- Is the surficial aquifer well characterized such that we can have confidence in designing and implementing a ground water flow path study? The use of fecal bacteria as a tracer may not be appropriate as it does not mimic the transport of anionic inorganic constituents. There is some merit to use of caffeine, acetaminophen and a few other wastewater indicators to evaluate ground water flow paths (I believe the USGS Toxics program has evaluated how conservative the various wastewater contaminants are in selected ground water and surface water systems), however, some inorganic constituents and properties (specific conductance, chloride, boron, etc.) or field-based detergent assays could suffice at a lower cost. Is there a scientifically defensible approach to scale up from the flow path work to that of the cumulative impacts of the septic area in general? What test locations would allow this? We can assume that there has been appreciable sorption of nutrients in drain fields and the surficial aquifer that will undoubtedly take additional flushing to reduce nutrient levels in ground water discharge to predevelopment levels. Work at Cape Cod toxics site may have some useful lessons in this regard.
- Occurrence of algae and water temperature are reasonable ways to screen for locations where groundwater is discharging to the lake. However, groundwater discharge should be confirmed using piezometers before proceeding with other work. Clarify whether groundwater discharge generally occurs to the lake – i.e., at most locations along the lake, at most times.
- The proposal represents further work on nutrient and bacteria issues at Lake Crescent and references the past bacteria study but not the ongoing study related to constructing a nutrient budget. It is a good proposal, but the issue should have been addressed previously.

CATEGORY: Intensive/Synoptic COST: \$294,200
REGION: Southeast PARK: Great Smoky Mountains
National Park
PROJECT TITLE: Assessing Impacts of Hemlock Woolly Adelgid on Hemlock
Dominated Streams

COMMENTS:

- Stream stage is a poor second choice for evaluate stream characteristics. At a minimum, consider development of a low flow rating and use of stream discharges associated with the samples in doing your data analysis. Sampling frequencies are quite low, especially with regard to pesticides. What alternative approaches are there to better leverage these results (passive samplers, bed sediment surveys, time integrated autosampling....).
- Project cost and time commitment to develop a pre-effects baseline appears to be too large. Unclear on the geochemical mechanism that would cause significant changes in trace-element concentration resulting from vegetation changes. Potential diel changes could be larger than seasonal changes. Limited in-kind contributions.
- Stress the biological diversity of the Smoky Mountains, including stream ecology at risk. Please provide more detail on project costs.
- It is difficult to say whether 2-3 years of water quality data will answer the proposal questions or provide adequate baseline data to assess impacts of the hemlock woolly adelgid infestation.
- Significant uncertainty exists in the timing, incidence, rate and extent of infestation and mortality from adelgids. This, coupled with the relatively limited number of sampling sites, low sampling frequency and relatively short study duration calls into question how this study will be able to accomplish the stated objectives.

CATEGORY: Fixed Station COST: \$64,000
REGION: Southeast PARK: Mammoth Cave National Park
PROJECT TITLE: Develop a Continuous Green River Monitoring Station

COMMENTS:

- The gage information appears most necessary for long-term resource management and is worthy of long-term, rather than project funding.
- The continuous monitoring approach to act as an early warning system for trace water-quality contaminants will not work. The proposal provides no background information that would indicate a continuous monitoring parameter can be significantly correlated with a trace contaminant such as pesticides, etc.... Specific water-quality parameters are not specified.
- This study is very important to the park. The park unit is in need of baseline water quality data due to the possible removal of DAM 6 which is currently being proposed by Army Corps. The study is poorly written and the Park didn't bother to make changes to this project which was previously submitted four years ago with the same PMIS number and was funded by this funding source.
- This proposal is identical to, and represents a continuation of, a study funded in FY03-04. It is for a stream gage and is not a water quality project.
- Not a water quality project.

