

 SCIENTIFIC RESEARCH AND COLLECTING PERMIT Grants permission in accordance with the attached general and special conditions United States Department of the Interior National Park Service Zion	Study#: ZION-00173 Permit#: ZION-2020-SCI-0013 Start Date: Mar 01, 2021 Expiration Date: Dec 31, 2021 Coop Agreement#: Optional Park Code:
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Name of institution represented: Adventure Scientists												
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Study Title: Wild and Scenic Rivers												
Purpose of study: <p>We will conduct a nationwide water quality monitoring study on Wild and Scenic River (WSR) segments across 40 states on federal lands. This project will update the water quality status of the majority of rivers across the National Wild and Scenic River system (NWSRS). Adventure Scientists is prepared to provide advisory data to support federal and state agencies in their efforts to implement the Clean Water Act (CWA), which include TMDLs (total maximum daily loads) as well as 303(b) and 303(d) listings. Adventure Scientists has designed the project to meet the priorities and standards of a variety of stakeholders and to ensure data can improve agencies' decision-making capacity. In addition, state water quality agencies have expressed that regular monitoring of all surface waters improve their management ability, which includes updating assessments of impaired waters and collecting data on waters identified as having a good status but with no data to verify those conditions. The multi-level and inter-agency relationships that develop during the life of the project should allow us to better coordinate across groups in response to water quality issues in the NWSRS.</p> <p>Several states require repeat monitoring and minimum data points to determine the status of surface waters, including rivers, in order to comply with the CWA. Therefore, Adventure Scientists is planning for four years of data collection (until fall/winter 2022) to enable the collection of sufficient data for river segments with significant data gaps/needs (e.g., unassessed and unknown waters). At full scale, volunteers may be deployed in 40 states.</p>												
Subject/Discipline: Water / Hydrology Water Quality Water Resources												
Locations authorized: <p>Research activities will take place in Zion NP and data collection will occur in designated Wild and Scenic portions of the Virgin River. Exact points for data collection are to be determined, and will be marked by volunteers when collecting data. Due to recent cyanobacteria blooms, we will avoid the North Fork of the Virgin River in 2020 until conditions improve.</p> <p>Kolob Creek has been dropped and will no longer be a part of the sampling plan. One segment of the N Fork Virgin accessed via the Narrow will remain a part of the sampling plan.</p>												
Transportation method to research site(s): Sampling locations will be accessed on foot.												
Collection of the following specimens or materials, quantities, and any limitations on collecting: Chemical and physical condition data, metadata, in situ data collection, basic field measurements, habitat assessment. Refer to Proposal, no specimens are to be collected.												
*REQUIRED EQUIPMENT DECONTAMINATION:												

Decontaminate all equipment, personal items, and clothing that have come into contact with water or mud to minimize the potential for spreading of exotic aquatic invasive species between streams

A. Remove all mud and debris using a scrub brush.

B. Make a 5% cleaning solution of quaternary ammonium compound. This is a common cleaning agent used in homes, swimming pools, and hospitals that is safe for gear and equipment when used at the recommended concentration. Two brands are readily available from GSA or local suppliers: Quat128® (by Waxie) or Sparquat 256® (by Spartan). Use one of these products and the appropriate amount of tap water to make the 5% cleaning solution (Table 1). Cost and effectiveness of the two brands are comparable.

C. Test the cleaning solution before each use. If the concentration is too weak, adjust the concentration or dispose of the used solution properly and make a new solution.

To determine if the solution is below 5% strength use “Quat Chek 1000” Test Papers (purchase these from the supplier of the cleaning compound). The used cleaning solution needs to be diluted to about 600 parts per million (ppm) of ammonium compounds before it can be tested with these papers.

-Take one cup of 5% cleaning solution made from Sparquat 256®, and pour it into a bucket. Add 5 cups of water and mix. OR

-Take one cup of 5% cleaning solution made from Quat128®, pour it into a bucket. Add 4 cups of water and mix. Test the diluted solution with “Quat Chek” Test Paper. Match the color of the paper with the ppm’s on the color chart. For optimal disinfection, the diluted solution should have a concentration between 600 and 800 ppm. Do not use the diluted solution for decontamination.

D. Decontaminate sampling equipment. Place the 5% cleaning solution in a backpack spray pump, and use this to apply the solution to equipment. The solution must be in contact with the surface being sanitized for at least 10 minutes.

E. Rinse sanitized equipment with water. When feasible, allow to dry completely before entering another body of water.

F. Dispose of used cleaning solution properly. Disposal of used cleaning solution must be in compliance with all local, state, and federal regulations. Do not dump cleaning solution into any stream or lake, or on areas where it can migrate into any storm drain, body of water, or sensitive habitat.

Name of repository for specimens or sample materials if applicable:

NPS General Conditions for Scientific Research and Collecting Permit (available at the RPRS HELP page) apply to this permit. The following specific conditions or restrictions, and any attached conditions, also apply to this permit:

PARK SPECIFIC CONDITIONS FOR SCIENTIFIC RESEARCH AND COLLECTING PERMITS

United States Department of the Interior

National Park Service

ZION NATIONAL PARK

1. PERMITS & APPROVALS

The Principle Investigator (PI) is required to ensure that all applicable state, federal, and park specific permit requirements and/or institutional approvals (i.e. ESA, IACUC, IRB, OMB, etc.) are met prior to the onset of research.

a) A copy of any required permits and institutional approvals will be provided to the park before an NPS Scientific Research Permit will be issued.

b) The PI is responsible for obtaining all appropriate wilderness permits and abiding by all permit conditions. Avoid trampling vegetation, cryptobiotic soils, and the creation of new paths/trails. If applicable, the PI will contact the Wilderness Permit Coordinator by phone at (435)-772-7611 or by email at Annette_Werderich@nps.gov before the field season to obtain a Wilderness Permit. Additional information on the Zion Wilderness Reservation System may be located at: <https://zionpermits.nps.gov/>. Refer to Communications & Conduct for additional details.

c) NPS research permits are not valid until all required signatures are received by the principle investigator, NPS authorizing officials, and, if applicable, the responsible official at the custodial institution.

d) A copy of NPS permits must be on site at all time. Place your Vehicle Identification Tag on the driver side dash

e) Contact Zion Resource Management and Research Division prior to accessing Parunaweap Canyon, additional permissions are required. Please contact:

Chief of Resource Management and Research

Phone: 435-772-0188

email: Cassity_Bromley@nps.gov

Any violation of the terms and conditions stipulated in the NPS research permit or Wilderness Permit will result in revocation of both.

2. COMMUNICATIONS & CONDUCT

a) Communications

• Park staff must be notified of implementation prior to commencement of project activities.

• The PI will give seven (7) days’ notice to the park prior to the commencement of activities.

• If research is conducted within areas managed as wilderness, the PI will maintain monthly contact with the Wilderness permitting office and provide a tentative schedule of planned trips. If any changes to the planned trips are made, including the use of alternate routes or trails, the PI will contact the Wilderness Permit Coordinator as soon as possible.

•Any damage to park resource must be reported immediately. Also include notification of any unexpected problems or any modifications to project implementation. Any decisions made in the field that result in greater impacts than anticipated by the proposed action must undergo additional environmental analysis. Please contact:
Research Permit and Reporting System Coordinator
Phone: 435-772-0144

b)Conduct

- YOUR SAFETY IS YOUR RESPONSIBILITY. Review ZION Safety Information and ZION Backpacking Safety Information prior to the onset of field activities.
- If visitors or park staff are encountered, the research team will explain their work in a courteous manner.
- Whenever possible, PI and research teams will wear agency/institutional apparel to facilitate identification by NPS and visitors.
- Vehicle parking will occur within designated areas only.
- If fieldwork is anticipated to occur in areas managed as wilderness, the PI will ensure the research team will carry out the following mitigations prior to and/or throughout each of your research trips to ZION:

Prior to the onset of field activities, all research team members will:

- oReview ZION Wilderness Overview, Guide, and Permit webpage. The ZION Wilderness Stewardship Plan is also available online for additional information.
- oReview NPS Wilderness information located online at: NPS Wilderness & NPS Wilderness YouTube Channel
- oReview Leave No Trace Principles and agree to minimize impacts to wilderness character wherever possible.
- oIf camping overnight, submit a Wilderness Permit Reservation and collect your Wilderness Permit at the park visitor center prior to engaging in field activities.

Throughout field activities, all research team members will:

- oEqual no more than 6 individuals for all trips into the Wilderness.
- oWear agency/institutional apparel to facilitate identification by NPS staff & visitors.
- oTravel on foot and stay on trails until reaching the work site.
- oWhen travel off-trail is required, the team will travel on slick rock or stagger (not in a line) to mitigate trail creation and avoid crushing vegetation.
- oAvoid sensitive riparian areas where possible and use the minimum number of passes required to conduct research.
- oAvoid working on steep slopes and will refrain from obtaining samples and/or removing vegetation cover in areas with intensifying gradients.
- oAlways select the least visible sampling sites possible.
- oRehabilitate any collection sites to as natural a condition as possible and/or minimize disturbance to wildlife, including handling, to the extent practical.
- oCarry all trash, including toilet paper, out of the wilderness.
- oImplement the use of environmentally friendly human waste disposal bags wherever possible. Examples include WAG bags or Restop2.
- oRemove any spilled or dropped food items to ensure wildlife does not consume human food.
- oIf camping overnight, the research team must obtain a wilderness permit and camp in established campsites. When no campsites are present close to work areas, proposed camping locales will be evaluated in coordination with the wilderness resources office. Campsites will be selected only on resilient surfaces to minimize impacts and support the rapid recovery of a site. All wilderness regulations will be observed, and any exceptions will be specifically addressed as needed.
- oResearch Team camps in Wilderness will support the concepts of "Leave-No-Trace" camping and will abide by all park camping regulations.

3.DATA & COLLECTIONS

a)Data

- All official and non-official records created from this project will be accessioned and cataloged in the parks archives collection (see Curation and Cataloging for additional details). Official and non-official records include but are not limited to field notes, reports, publications, thesis, presentations, databases, photos, maps, recordings, specimens.
- If geospatial data is collected, applicants will review the NPS GIS data standards and will provide ZION National Park with its data in shapefile (.shp) or geodatabase (.gdb) format, in Universal Transverse Mercator (UTM) (Zone 12) projection, Datum NAD83, with Federal Geographic Data Committee (FGDC) compliant metadata. Digital data must also include a full metadata file that describes that data, including the spatial reference system, contact information, and a summary of data collection methods. If you have questions regarding these specifications, contact the GIS Specialist at Zion National Park by phone at 435-772-0213 or by email at Greg_S_Comer@nps.gov. NPS GIS Data Specifications may also be located at: https://www.nps.gov/gis/data_standards/
- Principle investigators and associated researchers will refrain from disseminating any form of data collected in conjunction to or a part of an ongoing planning effort by the NPS without prior approval. NPS planning activities are governed by several laws and regulations that protect preliminary information, planning deliberations internally and with cooperating agencies, and publication of information for public review including the National Environmental Policy Act, Data Quality Act, Federal Advisory Committee Act, Freedom of Information Act and Council on Environmental Quality regulations, among others. Requests to present, publish, or share

project data in any format prior to the completion of the planning process are subject to the approval of the Superintendent.

- oWritten requests to share data must be received at least 30 days prior to any data exchange.
- oApproved data sharing requests will be required to remove or change all personally identifiable information and/or sensitive data before any files are shared with other researchers or results are made public. All personally identifiable information must also be destroyed and/or deleted upon completion of the study.
- oPreliminary results, deliberative draft, and/or other data disclaimers must be labeled clearly on all data prior to exchange.
- oAdditional conditions and/or restrictions may be applied on a case-by-case basis.
- oOnce a decision document for the planning process has been released by the NPS, only peer-reviewed data may be exchanged.

b)Specimens or Materials

- Any and all specimens sampled or artifacts collected as part of the PIs research and not consumed in analysis remain federal property and will be accessioned and cataloged into the park unit’s museum collection whether they are stored at an NPS facility or placed on loan to an agreed upon repository, see Cataloging & Curation section for additional details.
- The NPS reserves the right to designate the repositories of all specimens removed from the park and to approve or restrict reassignment of specimens from one repository to another.
- For projects involving consumptive analysis, information/results on specimens/archeological materials must be included in the Investigator’s Annual Report (IAR), see Reporting for additional details. Copies of all research reports, data, and field notes will be cataloged and curated permanently into the park archives and museum collection, see Cataloging & Curation section for additional details. Specimens/archeological material destroyed for analysis or research do not need to be cataloged.

4.CATALOGING & CURATION

The Code of Federal Regulations (CFR), specifically 36 CFR 2.5(g) and 36 CFR 79, outlines specific conditions that govern curation of specimens/archeological material and reporting of related data. If the PI or researcher collects specimens/archeological material that are to be permanently retained – regardless of where they are stored – those specimens/archeological material must be accessioned and cataloged into the National Park Service (NPS) National Catalog and must bear official NPS museum labels. The park’s museum curator is available to assist in accessioning and cataloging throughout the collection process.

- Researchers are encouraged to contact the Curator’s office at any time during this process with any questions that may arise. Curatorial staff is available to help the PI comply with the terms of their permit and make compliance as easy as possible under current regulations. Refer to the Standard Operating Procedures (SOP) Curation Research Requirements provided during the RPRS application process for further details.
- If you have questions regarding curation requirements, please contact the museum curator at Zion National Park by phone at 435.772.0146 or email at email: zion_museum@nps.gov

5.REPORTING

- a)The principal investigator is required to submit an IAR by the end of each calendar year. The principal investigator can report cataloging activity within this report or can provide this information directly to the curator at the end of each calendar year.
- b)If this is a multi-year study, reapply annually as permits are issued on a calendar year basis. All conditions must have been met during the previous year for approval.
- c)Upon completion of a study (particularly multiyear studies), a final report (e.g. theses, publications, report, etc.) summarizing findings/analysis will be provided to the park.
- d)Three copies of all scientific and other publications resulting entirely or in part from research and/or collecting through the issuance of this permit will be furnished to the Park Superintendent.

Summary of permitted field methods and activities:

This project empowers Adventure Scientists’ volunteer network with the tools, technology, and guidance to collect water quality data across over 13,000 miles of WSRs managed by USFS, BLM, and NPS. Adventure Scientists will leverage its volunteer communities of whitewater rafters and kayakers as well as backpackers, mountain bikers, day-hikers, and trailrunners to collect the necessary data. We will launch the project’s first phase as a small-scale nationwide effort, with priority given to the nearly 4000 river miles of unassessed and unknown water quality managed by your agencies. These rivers span 16 of 40 states with WSRs. In the second project phase, Adventure Scientists intends to expand the project scope by prioritizing river segments with significant data gaps as well as those with identified impairments under the CWA. We will also incorporate previously collected data throughout the rivers managed by these three federal agencies.

We will focus on parameters that can be collected via field instruments or observations. Volunteers will deploy Hach probes that monitor dissolved oxygen (DO), pH, temperature, total dissolved solids (TDS), salinity and conductivity. Field equipment will be attended at all times by the volunteer and the volunteer will not be installing or leaving any equipment in the field. While in the field, volunteers will collect both chemical and physical condition data, requiring volunteers to: (1) access pre-selected field sites; (2) mark GPS coordinates and exact time of data collection; (3) deploy a data logger/sensor for the collection of basic parameters (temp, DO, pH, conductivity, TDS, salinity) in situ; and (4) conduct a qualitative habitat assessment and take photos.

Recommended by park staff(name and title):

Reviewed by Collections Manager:

Yes X No

Approved by park official:

Date Approved:

Title:

Chief of Resource Management & Research



I Agree To All Conditions And Restrictions Of this Permit As Specified
(Not valid unless signed and dated by the principal investigator)

 2/22/21

(Principal investigator's signature)

(Date)

THIS PERMIT AND ATTACHED CONDITIONS AND RESTRICTIONS MUST BE CARRIED AT ALL TIMES WHILE CONDUCTING RESEARCH ACTIVITIES IN THE DESIGNATED PARK(S)



GENERAL CONDITIONS For SCIENTIFIC RESEARCH AND COLLECTING PERMIT

United States Department of the Interior
National Park Service

1. **Authority** - The permittee is granted privileges covered under this permit subject to the supervision of the superintendent or a designee, and shall comply with all applicable laws and regulations of the National Park System area and other federal and state laws. A National Park Service (NPS) representative may accompany the permittee in the field to ensure compliance with regulations.
2. **Responsibility** - The permittee is responsible for ensuring that all persons working on the project adhere to permit conditions and applicable NPS regulations.
3. **False information** - The permittee is prohibited from giving false information that is used to issue this permit. To do so will be considered a breach of conditions and be grounds for revocation of this permit and other applicable penalties.
4. **Assignment** - This permit may not be transferred or assigned. Additional investigators and field assistants are to be coordinated by the person(s) named in the permit and should carry a copy of the permit while they are working in the park. The principal investigator shall notify the park's Research and Collecting Permit Office when there are desired changes in the approved study protocols or methods, changes in the affiliation or status of the principal investigator, or modification of the name of any project member.
5. **Revocation** - This permit may be terminated for breach of any condition. The permittee may consult with the appropriate NPS Regional Science Advisor to clarify issues resulting in a revoked permit and the potential for reinstatement by the park superintendent or a designee.
6. **Collection of specimens (including materials)** - No specimens (including materials) may be collected unless authorized on the Scientific Research and Collecting permit.

The general conditions for specimen collections are:

- Collection of archeological materials without a valid Federal Archeology Permit is prohibited.
- Collection of federally listed threatened or endangered species without a valid U.S. Fish and Wildlife Service endangered species permit is prohibited.
- Collection methods shall not attract undue attention or cause unapproved damage, depletion, or disturbance to the environment and other park resources, such as historic sites.
- New specimens must be reported to the NPS annually or more frequently if required by the park issuing the permit. Minimum information for annual reporting includes specimen classification, number of specimens collected, location collected, specimen status (e.g., herbarium sheet, preserved in alcohol / formalin, tanned and mounted, dried and boxed, etc.), and current location.
- Collected specimens that are not consumed in analysis or discarded after scientific analysis remain federal property. The NPS reserves the right to designate the repositories of all specimens removed from the park and to approve or restrict reassignment of specimens from one repository to another. Because specimens are Federal property, they shall not be destroyed or discarded without prior NPS authorization.
- Each specimen (or groups of specimens labeled as a group) that is retained permanently must bear NPS labels and must be accessioned and cataloged in the NPS National Catalog. Unless exempted by additional park - specific stipulations, the permittee will complete the labels and catalog records and will provide accession information. It is the permittee's responsibility to contact the park for cataloging instructions and specimen labels as well as instructions on repository designation for the specimens.
- Collected specimens may be used for scientific or educational purposes only, and shall be dedicated to public benefit and be accessible to the public in accordance with NPS policies and procedures.
- Any specimens collected under this permit, any components of any specimens (including but not limited to natural organisms, enzymes or other bioactive molecules, genetic materials, or seeds), and research results derived from collected specimens are to be used for

scientific or educational purposes only, and may not be used for commercial or other revenue - generating purposes unless the permittee has entered into a Cooperative Research And Development Agreement(CRADA) or other approved benefit - sharing agreement with the NPS.The sale of collected research specimens or other unauthorized transfers to third parties is prohibited.Furthermore, if the permittee sells or otherwise transfers collected specimens, any components thereof, or any products or research results developed from such specimens or their components without a CRADA or other approved benefit-sharing agreement with NPS, permittee will pay the NPS a royalty rate of twenty percent(20 %) of gross revenue from such sales or other revenues. In addition to such royalty, the NPS may seek other damages to which the NPS may be entitled including but not limited to injunctive relief against the permittee.

7. **Reports** - - The permittee is required to submit an Investigator's Annual Report and copies of final reports, publications, and other materials resulting from the study. Instructions for how and when to submit an annual report will be provided by NPS staff.Park research coordinators will analyze study proposals to determine whether copies of field notes, databases, maps, photos, and / or other materials may also be requested.The permittee is responsible for the content of reports and data provided to the National Park Service

8. **Confidentiality** - - The permittee agrees to keep the specific location of sensitive park resources confidential. Sensitive resources include threatened species, endangered species, and rare species, archeological sites, caves, fossil sites, minerals, commercially valuable resources, and sacred ceremonial sites.

9. **Methods of travel** - Travel within the park is restricted to only those methods that are available to the general public unless otherwise specified in additional stipulations associated with this permit.

10. **Other permits** - The permittee must obtain all other required permit(s) to conduct the specified project.

11. **Insurance** - If liability insurance is required by the NPS for this project, then documentation must be provided that it has been obtained and is current in all respects before this permit is considered valid.

12. **Mechanized equipment** - No use of mechanized equipment in designated, proposed, or potential wilderness areas is allowed unless authorized by the superintendent or a designee in additional specific conditions associated with this permit.

13. **NPS participation** - The permittee should not anticipate assistance from the NPS unless specific arrangements are made and documented in either an additional stipulation attached to this permit or in other separate written agreements.

14. **Permanent markers and field equipment** - The permittee is required to remove all markers or equipment from the field after the completion of the study or prior to the expiration date of this permit. The superintendent or a designee may modify this requirement through additional park specific conditions that may be attached to this permit. Additional conditions regarding the positioning and identification of markers and field equipment may be issued by staff at individual parks.

15. **Access to park and restricted areas** - Approval for any activity is contingent on the park being open and staffed for required operations. No entry into restricted areas is allowed unless authorized in additional park specific stipulations attached to this permit.

16. **Notification** - The permittee is required to contact the park's Research and Collecting Permit Office (or other offices if indicated in the stipulations associated with this permit) prior to initiating any fieldwork authorized by this permit.Ideally this contact should occur at least one week prior to the initial visit to the park.

17. **Expiration date** - Permits expire on the date listed. Nothing in this permit shall be construed as granting any exclusive research privileges or automatic right to continue, extend, or renew this or any other line of research under new permit(s).

18. **Other stipulations** - This permit includes by reference all stipulations listed in the application materials or in additional attachments to this permit provided by the superintendent or a designee. Breach of any of the terms of this permit will be grounds for revocation of this permit and denial of future permits.