



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at ***wvOASIS.gov***. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at ***WVPurchasing.gov*** with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

Header 1

List View

**General Information** [Contact](#) [Default Values](#) [Discount](#) [Document Information](#) [Clarification Request](#)

Procurement Folder: 1810217

Procurement Type: Central Master Agreement

Vendor ID:

Legal Name: Spheros Environmental

Alias/DBA:

Total Bid: \$0.00

Response Date:

Response Time:

Responded By User ID:

First Name:

Last Name:

Email:

Phone:

SO Doc Code: CRFQ

SO Dept: 0313

SO Doc ID: DEP2600000013

Published Date: 11/5/25

Close Date: 11/12/25

Close Time: 13:30

Status: Closed

Solicitation Description:

Total of Header Attachments: 1

Total of All Attachments: 1



Department of Administration  
Purchasing Division  
2019 Washington Street East  
Post Office Box 50130  
Charleston, WV 25305-0130

State of West Virginia  
Solicitation Response

**Proc Folder:** 1810217  
**Solicitation Description:** BENTHIC MACROINVERTEBRATE SAMPLE PROCESSING AND/OR IDENTIFIC  
**Proc Type:** Central Master Agreement

| Solicitation Closes | Solicitation Response        | Version |
|---------------------|------------------------------|---------|
| 2025-11-12 13:30    | SR 0313 ESR11112500000003077 | 1       |

**VENDOR**  
VS0000050510  
Spheros Environmental

**Solicitation Number:** CRFQ 0313 DEP2600000013  
**Total Bid:** 0  
**Response Date:** 2025-11-11  
**Response Time:** 17:35:49  
**Comments:**

**FOR INFORMATION CONTACT THE BUYER**  
Joseph (Josh) E Hager III  
(304) 558-2306  
joseph.e.hageriii@wv.gov

**Vendor**  
**Signature X** **FEIN#** **DATE**

All offers subject to all terms and conditions contained in this solicitation

| Line | Comm Ln Desc                                     | Qty     | Unit Issue | Unit Price | Ln Total Or Contract Amount |
|------|--------------------------------------------------|---------|------------|------------|-----------------------------|
| 1    | Sample Sorting and Identification to Genus Level | 0.00000 | EA         | 475.000000 | 0.00                        |

| Comm Code | Manufacturer | Specification | Model # |
|-----------|--------------|---------------|---------|
| 81131504  |              |               |         |

**Commodity Line Comments:**

**Extended Description:**

SORTING AND IDENTIFICATION OF A 200 ORGANISM SUBSAMPLE TO GENUS LEVEL: INCLUDE TRAVEL COST FOR SAMPLE PICKUP AND DELIVERY PER UNIT.

| Line | Comm Ln Desc                                          | Qty     | Unit Issue | Unit Price | Ln Total Or Contract Amount |
|------|-------------------------------------------------------|---------|------------|------------|-----------------------------|
| 2    | Sample Ident to Genus Level Only : Samples Pre-sorted | 0.00000 | HOUR       | 180.000000 | 0.00                        |

| Comm Code | Manufacturer | Specification | Model # |
|-----------|--------------|---------------|---------|
| 81131504  |              |               |         |

**Commodity Line Comments:**

**Extended Description:**

Sample Identified to Genus Level Only : Samples Pre-sorted  
Reference 2.2.1.1B in specifications

| Line | Comm Ln Desc                                     | Qty     | Unit Issue | Unit Price | Ln Total Or Contract Amount |
|------|--------------------------------------------------|---------|------------|------------|-----------------------------|
| 3    | Profession Staff Representation of Data in Legal | 0.00000 | HOUR       | 140.000000 | 0.00                        |

| Comm Code | Manufacturer | Specification | Model # |
|-----------|--------------|---------------|---------|
| 81131504  |              |               |         |

**Commodity Line Comments:**

**Extended Description:**

PROFESSIONAL STAFF REPRESENTATION OF DATA IN LEGAL  
Reference 2.2.1.5 in specifications



Department of Administration  
Purchasing Division  
2019 Washington Street East  
Post Office Box 50130  
Charleston, WV 25305-0130

State of West Virginia  
Centralized Request for Quote  
Laboratory

|                                                                                      |                            |                         |                                 |
|--------------------------------------------------------------------------------------|----------------------------|-------------------------|---------------------------------|
| <b>Proc Folder:</b> 1810217                                                          |                            |                         | <b>Reason for Modification:</b> |
| <b>Doc Description:</b> BENTHIC MACROINVERTEBRATE SAMPLE PROCESSING AND/OR IDENTIFIC |                            |                         |                                 |
| <b>Proc Type:</b> Central Master Agreement                                           |                            |                         |                                 |
| <b>Date Issued</b>                                                                   | <b>Solicitation Closes</b> | <b>Solicitation No</b>  | <b>Version</b>                  |
| 2025-10-24                                                                           | 2025-11-12 13:30           | CRFQ 0313 DEP2600000013 | 1                               |

**BID RECEIVING LOCATION**

BID CLERK  
DEPARTMENT OF ADMINISTRATION  
PURCHASING DIVISION  
2019 WASHINGTON ST E  
CHARLESTON WV 25305  
US

**VENDOR**

**Vendor Customer Code:**

**Vendor Name :**

**Address :** Spheros Environmental

**Street :** 1420 South Blaine St., Suite 14

**City :** Moscow

**State :** Idaho

**Country :** USA

**Zip :** 83843

**Principal Contact :** Megan Payne

**Vendor Contact Phone:** 208-882-2588

**Extension:**

**FOR INFORMATION CONTACT THE BUYER**

Joseph (Josh) E Hager III

(304) 558-2306

joseph.e.hageriii@wv.gov

**Vendor Signature X** *Joseph Miller*

**FEIN#**

87-220788

**DATE** 1/11/25

**All offers subject to all terms and conditions contained in**

Date Printed: Oct 24, 2025

Page: 1

**this solicitation**

FORM ID: WV-PRC-CRFQ-002 2020/05

ADDITIONAL INFORMATION

The West Virginia Purchasing Division is soliciting bids on behalf of The West Virginia Department of Environmental Protection to establish an open-end contract for the processing and identification of benthic macroinvertebrate samples collected from West Virginia waters per the attached specifications and terms and conditions.

| INVOICE TO                                                                                      |  | SHIP TO                                                                                              |  |
|-------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------|--|
| ENVIRONMENTAL PROTECTION<br>DIV OF WASTE AND WATER MGT<br>601 57TH ST SE<br>CHARLESTON WV<br>US |  | ENVIRONMENTAL PROTECTION<br>DIVISION OF WATER AND WASTE MGT<br>601 57TH ST SE<br>CHARLESTON WV<br>US |  |

| Line | Comm Ln Desc                                     | Qty     | Unit Issue | Unit Price | Total Price |
|------|--------------------------------------------------|---------|------------|------------|-------------|
| 1    | Sample Sorting and Identification to Genus Level | 0.00000 | EA         | 475.00     |             |

| Comm Code | Manufacturer | Specification | Model # |
|-----------|--------------|---------------|---------|
| 81131504  |              |               |         |

Extended Description:  
SORTING AND IDENTIFICATION OF A 200 ORGANISM SUBSAMPLE TO GENUS LEVEL: INCLUDE TRAVEL COST FOR SAMPLE PICKUP AND DELIVERY PER UNIT.

| INVOICE TO                                                                                      |  | SHIP TO                                                                                              |  |
|-------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------|--|
| ENVIRONMENTAL PROTECTION<br>DIV OF WASTE AND WATER MGT<br>601 57TH ST SE<br>CHARLESTON WV<br>US |  | ENVIRONMENTAL PROTECTION<br>DIVISION OF WATER AND WASTE MGT<br>601 57TH ST SE<br>CHARLESTON WV<br>US |  |

| Line | Comm Ln Desc                                          | Qty     | Unit Issue | Unit Price | Total Price |
|------|-------------------------------------------------------|---------|------------|------------|-------------|
| 2    | Sample Ident to Genus Level Only : Samples Pre-sorted | 0.00000 | HOUR       | 180.00     |             |

| Comm Code | Manufacturer | Specification | Model # |
|-----------|--------------|---------------|---------|
| 81131504  |              |               |         |

Extended Description:  
Sample Identified to Genus Level Only : Samples Pre-sorted  
  
Reference 2.2.1.1B in specifications

| INVOICE TO                                                                                   |    | SHIP TO                                                                                           |    |
|----------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------|----|
| ENVIRONMENTAL PROTECTION<br>DIV OF WASTE AND WATER MGT<br>601 57TH ST SE<br>CHARLESTON<br>US |    | ENVIRONMENTAL PROTECTION<br>DIVISION OF WATER AND WASTE MGT<br>601 57TH ST SE<br>CHARLESTON<br>US |    |
|                                                                                              | WW |                                                                                                   | WW |

| Line | Comm Ln Desc                                     | Qty     | Unit Issue | Unit Price | Total Price |
|------|--------------------------------------------------|---------|------------|------------|-------------|
| 3    | Profession Staff Representation of Data in Legal | 0.00000 | 0.00000    | 140.00     |             |
|      |                                                  |         | 0.00000    |            |             |

| Comm Code | Manufacturer | Specification | Model # |
|-----------|--------------|---------------|---------|
| 81131504  |              |               |         |

**Extended Description:**  
PROFESSIONAL STAFF REPRESENTATION OF DATA IN LEGAL  
Reference 2.2.1.5 in specifications

| SCHEDULE OF EVENTS |       |            |
|--------------------|-------|------------|
| Line               | Event | Event Date |

**DESIGNATED CONTACT:** Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

(Printed Name and Title) Megan Payne Technical Sales \_\_\_\_\_

(Address) 1420 South Blaine St., Suite 1, Moscow, Idaho 83843 \_\_\_\_\_

(Phone Number) / (Fax Number) 208-882-2588 / N/A \_\_\_\_\_

(email address) megan.payne@spherosenvironmental.com \_\_\_\_\_

**CERTIFICATION AND SIGNATURE:** By signing below, or submitting documentation through wvOASIS, I certify that: I have reviewed this Solicitation/Contract in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation/Contract for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that this bid or offer was made without prior understanding, agreement, or connection with any entity submitting a bid or offer for the same material, supplies, equipment or services; that this bid or offer is in all respects fair and without collusion or fraud; that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; that I am authorized by the Vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on Vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

By signing below, I further certify that I understand this Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law; and that pursuant to W. Va. Code 5A-3-63, the entity entering into this contract is prohibited from engaging in a boycott against Israel.

Spheros Environmental

(Company) \_\_\_\_\_

*Joseph Miller*

(Signature of Authorized Representative) \_\_\_\_\_

Joseph Miller

11/11/25

(Printed Name and Title of Authorized Representative) (Date)  
Joseph Miller

5092644598

(Phone Number) (Fax Number)

jmillers@fourpeaksenv.com

(Email Address) \_\_\_\_\_



ADDENDUM ACKNOWLEDGEMENT FORM  
SOLICITATION NO.:

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

*(Check the box next to each addendum received)*

- |                                                    |                                          |
|----------------------------------------------------|------------------------------------------|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6  |
| <input type="checkbox"/> Addendum No. 2            | <input type="checkbox"/> Addendum No. 7  |
| <input type="checkbox"/> Addendum No. 3            | <input type="checkbox"/> Addendum No. 8  |
| <input type="checkbox"/> Addendum No. 4            | <input type="checkbox"/> Addendum No. 9  |
| <input type="checkbox"/> Addendum No. 5            | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Spheros Environmental

Company

*Joseph Miller*

Authorized Signature

11/11/25

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

EXHIBIT B  
PURCHASE OF PRICING PAGE

The following shall be provided according to the contract terms and conditions contained herein. Price must be provided for all the following in whole. Please note these are estimated quantities and do not reflect any guarantee of purchase. WVDEP may purchase more or less as needed.

| Item | Description                                                                                                                                                                                                                                                                    | Estimated<br>Quantity | Unit Price            | Total Cost/Extended Price |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|---------------------------|
| 1.   | Sorting and identification of<br>a 200 organism subsample to<br>Genus level; Cost must include<br>travel costs for sample pickup<br>and return of sample materials<br>(Voucher and Reference specimens)<br>to WVDEP per unit                                                   | <b>400</b>            | <u>\$475.00</u>       | \$190,000.00_____         |
| 2.   | Identification of a pre-sorted 200<br>organism subsample to Genus level;<br>WVDEP will cover expense of<br>delivery for pre-sorted samples to<br>vendor; Vendor will cover expense<br>of return for sample materials<br>(Voucher and Reference Specimens)<br>to WVDEP per unit | <b>200</b>            | <u>\$180.00</u> _____ | \$36,000.00_____          |
| 3.   | Cost/Hour for professional staff<br>representation of sorting and<br>identification in legal/administrative<br>setting                                                                                                                                                         | <b>2</b>              | <u>\$140.00</u> _____ | \$280.00_____             |

# **Ecological Taxonomy Laboratory**

**Benthic Macroinvertebrate Sample Processing  
and/or Identification**

**West Virginia Department of Environmental  
Protection**

**CRFQ 0313 DEP2300000013 Due Date: 11/12/2025**

## **PREPARED FOR:**

State of West Virginia Purchasing Department  
Josh Hager  
2019 Washington Street  
East Charleston, WV 25305  
(304) 558-2306  
josesph.e.hageriii@wv.gov

## **PREPARED BY:**

Megan Payne  
1420 South Blaine St., Suite 14  
Moscow, Idaho 83843  
(208) 882-2588  
megan.payne@spherosenvironmental.com

# TABLE OF CONTENTS

---

COVER LETTER ..... 2

ABOUT SPHEROS ENVIRONMENTAL ..... 3

STATEMENT OF WORK (Optional) ..... 3

    Sorting and Identification to Genus Level ..... 3

    Identification to Genus Level (samples pre-sorted)..... 6

    Legal Support..... 8

    Schedule and Deliverables ..... 8

# COVER LETTER

---

State of West Virginia Purchasing Department  
Josh Hager  
2019 Washington Street  
East Charleston, WV 25305  
(304) 558-2306  
josesph.e.hageriii@wv.gov

**RE: Benthic Macroinvertebrate Sample Processing and/or Identification**

Dear Josh,

Spheros Environmental is pleased to propose to the State of West Virginia our capabilities and expertise for processing and taxonomic identification of benthic macroinvertebrate samples. With the acquisition of EcoAnalysts LLC in January 2025, Spheros has 30 years of lower trophic level aquatic taxonomic experience from freshwater systems across North America. Our staff provide the highest quality identifications according to the literature and requirements of the protocol.

With the proposal material below, Spheros Environmental hopes to show an understanding of the project requirements along with the ability to meet the sample pickup and data delivery schedule. Spheros Environmental will also support with the requested legal components of the contract as needed.

Thank you for your time and consideration.

Sincerely,

Megan Payne  
1420 South Blaine St., Suite 14  
Moscow, Idaho 83843  
(208) 882-2588  
megan.payne@spherosenvironmental.com

# ABOUT SPHEROS ENVIRONMENTAL

---

Spheros Environmental integrates a diverse array of scientific disciplines, including air quality monitoring, water resources, digital technologies, climate services, permitting, and ecological sciences, to deliver scientifically robust and sustainable solutions to both private and public-sector clients nationwide.

Our interdisciplinary teams of environmental scientists, engineers, technicians, and researchers work collaboratively across the country, applying advanced methodologies and cutting-edge technologies to tackle the most pressing environmental challenges. From regulatory compliance and policy alignment to innovative scientific research, our solutions are designed to address both immediate and long-term environmental needs.

We specialize in a range of services, including ecological and natural resource consulting, environmental laboratory services, real-time air quality monitoring, climate adaptation strategies, and water management solutions. With a data-driven, evidence-based approach, we support clients in meeting regulatory requirements, mitigating environmental risks, and advancing sustainability goals.

At Spheros, we are committed to advancing environmental science and providing actionable insights that help our clients navigate complex environmental landscapes while ensuring measurable, positive impacts on the ecosystems and communities we serve.

## STATEMENT OF WORK (OPTIONAL)

---

Spheros Environmental's aquatic taxonomy laboratory located in Moscow, Idaho, formally named EcoAnalysts, will be handling the processing and identification of the benthic macroinvertebrate samples under this contract.

### Sorting and Identification to Genus Level

Benthic samples will be collected and prepared to ship by Spheros designated staff with hazardous shipping certifications. Chain-of-custodies will be maintained from initial receipt through samples return. Immediately upon receipt of benthic macroinvertebrate samples, all containers are inspected for damage or leakage. Sample labels are checked against chain of custody forms and/or packing slips and any discrepancies are noted. Receipt records are reported to the client within one business day of sample receipt. The chain of custody logs are reported, throughout the project, according to timelines and methods requested by the client. Samples are logged into the EcoAnalysts, Inc. custom LIMS database and assigned a unique sample tracking number.

A sample is checked out by a sorting technician via the LIMS. A sorting bench sheet is printed that contains the EcoAnalysts sample identification information and sorting protocols. The samples will

be prepared for sorting by rinsing in a 595µm sieve to remove additional fine particles. Inorganic material may be removed through elutriation and inspected for organisms under a 10x magnifying lamp by the primary and secondary technician. The remaining organic material will be evenly distributed into a 100-grid caton tray for quantitative subsampling.

A grid is randomly selected, and its contents transferred to a Petri dish. The material in the Petri dish will be sorted under a 10X illuminated magnifying lamp. The individual organisms are counted as they are placed into vials containing 70% ethanol. Grids are selected until the target minimum of 200 (+/-20%) benthic organisms is reached, or the entire volume has been processed. 4 grids must be sorted at minimum. Samples containing more than 240 organisms at the end of sorting and QC will be subsampled.

Sorters are trained to pick and count only benthic macroinvertebrates, with heads, that were alive during sampling and contain the attributes required for taxonomic identification. Organisms picked are placed in specific vials that will go to specialized taxonomists who focus on that group. Specimens rejected according to EcoAnalysts' standard include terrestrials, zooplankton, exuviae, and any organism without a head. Bryozoa will be sorted. Vertebrates will be retained if encountered but will not count towards the target count.

Laser-printed labels containing the appropriate sample tracking information are placed in the vial(s). The total number of organisms removed, the number of grids sorted out of the total, the time spent sorting, and the final volume of the remaining sample volume are all recorded on the sorting bench sheet, as well as comments significant to the preparation, sorting, and/or condition of the sample.

At least 20% of each sample is re-sorted by a quality control technician, who did not originally sort the sample, to ensure at least 90% of the organisms have been removed. The QCs are performed by technicians who have shown to achieve 90% efficacy on a minimum of 90% of samples they process. QC technicians are trained in the QC process by the sorting lab manager. The QC technician QCs a minimum of 20% of the sorted material from a given sample to ensure at least 90% of the organisms have been removed.

A taxonomist selects a sample for identification via the LIMS and empties it into a Petri dish. Under a dissecting and/or compound microscope, the organisms are identified to genus level, while Oligochaetes, Turbellaria, and Hirudinea will be left at family and Nemertea, Nematoda, Hydroida, and Bryozoa will be left at higher taxonomic levels, for the project following WVDEP Water Quality Standards. The taxonomist enters each taxon directly into the project database using a unique taxonomic code (this is done while at the microscope). The number of individuals of each taxon is counted and entered into the database. As the sample is being identified, the taxonomist enters data directly into the LIMS database and user interface. Benthic invertebrates will be vouchered to genus or family.

A synoptic reference collection will be prepared, where at least one specimen (preferably 3-5 specimens) of each taxon encountered is placed into a 1-dram vial containing 70% ethanol and is

properly labeled with identity and sample number. Depending on the requirements of the project, one or several reference collections can be made. Also, organisms can be vouchered by a specified taxonomic level, i.e. vouchered by each taxon per sample.

Taxonomic precision is quantified by comparing whole-sample identifications completed by a second taxonomist who did not perform the primary identification. Accuracy of taxonomy is qualitatively evaluated through specification of target hierarchical levels (e.g., family, genus, or species) and the specification of appropriate technical taxonomic literature or other references (e.g., identification keys, voucher specimens). To calculate taxonomic precision for benthic macroinvertebrate samples, 10% of the samples are randomly selected for re-identification. Comparison of the results of whole sample re-identifications provides a Percent Taxonomic Disagreement (PTD) calculated as:

*Equation 1. Percent Taxonomic Disagreement (PTD)*

$$PTD = \left[ 1 - \left( \frac{comp_{pos}}{N} \right) \right] \times 100$$

where

$comp_{pos}$  = the number of agreements

$N$  = the total number of individuals in the larger of the two counts.

The lower the PTD, the more similar taxonomic results are and the overall taxonomic precision is better. A Measurement Quality Objective (MQO) of  $\leq 15\%$  will be followed for taxonomic differences. Individual samples exceeding 15% are examined for taxonomic areas of substantial disagreement, the reasons for disagreement investigated, and corrective measures taken where needed.

Sample enumeration is another component of taxonomic precision. Final specimen counts for samples are dependent on the taxonomist, not the rough counts obtained during the sorting activity. Comparison of counts is quantified by calculation of percent difference in enumeration (PDE), calculated as:

*Equation 2. Percent Difference in Enumeration*

$$PDE = \left( \frac{|Tax1 - Tax2|}{Tax1 + Tax2} \right) \times 100$$

An MQO of  $\leq 10\%$  will be followed. Individual samples exceeding 10% are examined to determine reasons for the exceedance.



## MQO Evaluation

For samples exceeding these MQOs, corrective actions can include defining the taxa for which re-identification may be necessary (potentially even by a third party), for which samples (even outside of the 10% lot of QC samples) it is necessary, and where there may be issues of nomenclatural or enumeration problems.

Samples will be identified using the most appropriate technical literature that is accepted by the taxonomic discipline and reflects the accepted nomenclature. Where necessary, the Integrated Taxonomic Information System (ITIS, <http://www.itis.usda.gov/>) will be used to verify nomenclatural validity and spelling. A reference collection will be compiled as the samples are identified.

Data is directly entered into the LIMS database. Throughout the project and sample analysis, data entry is double checked for accuracy, and validated by the laboratory managers. The appropriate data are combined for each sample to obtain the sorting statistics and comprehensive taxa lists and counts.

Quality assurance data sheet checks are part of the sample validation process, and include scanning for apparent entry errors, measurement errors, omissions, and anomalies. Suspect data are flagged and/or excluded from use. Data may be presented in table, graph, and chart format. Unusual data are rechecked to verify their accuracy.

Data are delivered in an electronic format and will include pdf copies of the sorting bench sheets and Microsoft Excel files of the sorting, taxonomy, and quality control data. Excel spreadsheets will include the required client information.

## **Identification to Genus Level (samples pre-sorted)**

Immediately upon receipt of benthic macroinvertebrate samples, all containers are inspected for damage or leakage. Sample labels are checked against chain of custody forms and/or packing slips and any discrepancies are noted. Receipt records are reported to the client within one business day of sample receipt. The chain of custody logs are reported, throughout the project, according to timelines and methods requested by the client. Samples are logged into the EcoAnalysts, Inc. custom LIMS database and assigned a unique sample tracking number.

A taxonomist selects a sample for identification via the LIMS and empties it into a Petri dish. Under a dissecting and/or compound microscope, the organisms are identified to genus level, while Oligochaetes, Turbellaria, and Hirudinea will be left at family and Nemertea, Nematoda, Hydroida, and Bryozoa will be left at higher taxonomic levels, for the project following WVDEP Water Quality Standards. The taxonomist enters each taxon directly into the project database using a unique taxonomic code (this is done while at the microscope). The number of individuals of each taxon is counted and entered into the database. As the sample is being identified, the taxonomist enters data directly into the LIMS database and user interface. Benthic invertebrates will be vouchered to genus or family.

A synoptic reference collection will be prepared, where at least one specimen (preferably 3-5 specimens) of each taxon encountered is placed into a 1-dram vial containing 70% ethanol and is properly labeled with identity and sample number. Depending on the requirements of the project, one or several reference collections can be made. Also, organisms can be vouchered by a specified taxonomic level, i.e. vouchered by each taxon per sample.

Taxonomic precision is quantified by comparing whole-sample identifications completed by a second taxonomist who did not perform the primary identification. Accuracy of taxonomy is qualitatively evaluated through specification of target hierarchical levels (e.g., family, genus, or species) and the specification of appropriate technical taxonomic literature or other references (e.g., identification keys, voucher specimens). To calculate taxonomic precision for benthic macroinvertebrate samples, 10% of the samples are randomly selected for re-identification. Comparison of the results of whole sample re-identifications provides a Percent Taxonomic Disagreement (PTD) calculated as:

*Equation 1. Percent Taxonomic Disagreement (PTD)*

$$PTD = \left[ 1 - \left( \frac{comp_{pos}}{N} \right) \right] \times 100$$

where

$comp_{pos}$  = the number of agreements

$N$  = the total number of individuals in the larger of the two counts.

The lower the PTD, the more similar taxonomic results are and the overall taxonomic precision is better. A Measurement Quality Objective (MQO) of  $\leq 15\%$  will be followed for taxonomic differences. Individual samples exceeding 15% are examined for taxonomic areas of substantial disagreement, the reasons for disagreement investigated, and corrective measures taken where needed.

Sample enumeration is another component of taxonomic precision. Final specimen counts for samples are dependent on the taxonomist, not the rough counts obtained during the sorting activity. Comparison of counts is quantified by calculation of percent difference in enumeration (PDE), calculated as:

*Equation 2. Percent Difference in Enumeration*

$$PDE = \left( \frac{|Tax1 - Tax2|}{Tax1 + Tax2} \right) \times 100$$

An MQO of  $\leq 10\%$  will be followed. Individual samples exceeding 10% are examined to determine reasons for the exceedance.

## MQO Evaluation

For samples exceeding these MQOs, corrective actions can include defining the taxa for which re-identification may be necessary (potentially even by a third party), for which samples (even outside of the 10% lot of QC samples) it is necessary, and where there may be issues of nomenclatural or enumeration problems.

Samples will be identified using the most appropriate technical literature that is accepted by the taxonomic discipline and reflects the accepted nomenclature. Where necessary, the Integrated Taxonomic Information System (ITIS, <http://www.itis.usda.gov/>) will be used to verify nomenclatural validity and spelling. A reference collection will be compiled as the samples are identified.

Data is directly entered into the LIMS database. Throughout the project and sample analysis, data entry is double checked for accuracy, and validated by the laboratory managers. The appropriate data are combined for each sample to obtain the sorting statistics and comprehensive taxa lists and counts.

Quality assurance data sheet checks are part of the sample validation process, and include scanning for apparent entry errors, measurement errors, omissions, and anomalies. Suspect data are flagged and/or excluded from use. Data may be presented in table, graph, and chart format. Unusual data are rechecked to verify their accuracy.

Data are delivered in an electronic format and will include pdf copies of the sorting bench sheets and Microsoft Excel files of the sorting, taxonomy, and quality control data. Excel spreadsheets will include the required client information.

## **Legal Support**

Spheros Environmental will provide a professional staff representative to provide data validity as requested. Data verification will include, when Spheros was notified of sample shipment or collection completion, sample condition, sample preservation and maintenance, processing dates, and results. Paperwork, including chain-of-custodies and standard operating procedures, will also be supplied upon request. No testimonies will include data interpretation. There is no schedule set for legal support.

## **Schedule and Deliverables**

**Table 1.** Proposed schedule

| Sample Shipment Date | Data Delivery Date | Batch Delivery Schedule | Batch Data Requirements                                                       | Return to WVDEP                                                                          |
|----------------------|--------------------|-------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>April 1</b>       | August 31          | 6 weeks                 | BMI identification in Excel<br>Pdf of sorting bench sheets<br>PSE, PDE, & PTD | Return sample jars regularly<br>Return voucher collection<br>Return reference collection |
| <b>August 31</b>     | December 1         | 6 weeks                 | BMI identification in Excel<br>Pdf of sorting bench sheets<br>PSE, PDE, & PTD | Return sample jars regularly<br>Return voucher collection<br>Return reference collection |
| <b>December 31</b>   | February 28        | 6 weeks                 | BMI identification in Excel<br>Pdf of sorting bench sheets<br>PSE, PDE, & PTD | Return sample jars regularly<br>Return voucher collection<br>Return reference collection |

## Technical Capabilities

Spheros has sufficient in-house staff to effectively analyze the samples required according to schedule. Training of Spheros' project staff, when needed, is done internally through assistance from project operations staff. All benthic macroinvertebrate taxonomists will hold appropriate Society for Freshwater Science (SFS, formerly North American Benthological Society) certification. Certifications are provided at the end of the proposal, and information is also available on the Society's Taxonomic Certification Program website: <http://www.sfstcp.com/>.

**Table 1.** Spheros Freshwater Benthic Taxonomists

| <b>Name</b>          | <b>Education</b>                                                                 | <b>SFS Certifications</b>                                                                                                    |
|----------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Chip Barrett         | PhD – Zoology; MS – Zoology; BA – Zoology                                        | Oligochaeta, 2025                                                                                                            |
| Stacey Rice-Marshall | MA – Entomology BS – Biology                                                     | Chironomidae NA 2023                                                                                                         |
| Matt Hill            | MS – Fishery Science; BS - Entomology                                            | EPT East, 2025; EPT West, 2025;<br>General Arthropods East, 2025;<br>General Arthropods West, 2025;<br>Oligochaeta, 2025     |
| William Lavoie       | MS - Zoology and Physiology; BS - Fish & Wildlife Resources                      | EPT East, 2021; EPT West, 2021;<br>General Arthropods East, 2021;<br>General Arthropods West, 2021;<br>Chironomidae NA, 2021 |
| Kristin Hall         | BS – Environmental Science/Fisheries Resource                                    | Chironomidae NA 2023                                                                                                         |
| Anndrea Navesky      | MS – Entomology; BS - Biology                                                    | EPT East, 2021; EPT West, 2021;<br>General Arthropods East, 2021;<br>General Arthropods West, 2021                           |
| John Pfeiffer        | MS – Entomology; BS – Fisheries Resource Management                              | EPT East, 2021; EPT West, 2021;<br>General Arthropods East, 2021;<br>General Arthropods West, 2021                           |
| Laine Smith          | MS – Forest Health; BS - Forestry                                                | EPT East, 2023; EPT West, 2023;<br>General Arthropod East, 2025,<br>General Arthropod West, 2025                             |
| Gregory Wallace      | BS - Wildlife Conservation & Management                                          | Chironomidae NA, 2025;<br>Oligochaeta, 2025                                                                                  |
| Laurie Flaherty      | PhD- Environmental and Natural Resources; MS- Environmental Science; BS- Geology | Oligochaeta, 2023                                                                                                            |

| Name             | Education                                              | SFS Certifications |
|------------------|--------------------------------------------------------|--------------------|
| Michael Reuscher | PhD- Marine Biology; DIPLOM (MS & BS combine)- Biology | Oligochaeta, 2023  |

**Chip Barrett, Marine Polychaete & Freshwater Oligochaete Taxonomist** - Dr. Barrett joined EcoAnalysts in 2011 as a marine polychaete taxonomist. His primary responsibilities include taxonomic identification of marine invertebrates, quality assurance on identified samples, and the development and growth of the internal marine identification standard operating procedures. Prior to EcoAnalysts, Dr. Barrett has worked extensively in the marine bioassessment field for 20 years, including instructing entry level biology courses at the University of Hawaii, providing research assistance to the Bishop Museum in Hawaii, and as a Benthic invertebrate specialist for the Martin Ryan Institute of Galway, Ireland.

**Matt Hill, Benthic and Oligochaete Taxonomist** - Mr. Hill joined EcoAnalysts in 2005. His primary duties include performing original and QC identifications for general, oligochaete, and zooplankton (microcrustacea and rotifer) samples from freshwater, estuarine, and marine sites. He has also conducted field work for macroinvertebrate and planktonic collection. In addition to his laboratory and field work, Mr. Hill has also been active in employee development. He has conducted multiple courses (both internally and externally) for the subsampling and identification of oligochaetes. Mr. Hill is a certified taxonomist with the Society for Freshwater Science (formerly NABS) in EPT-East and West and is also a SCAMIT qualified taxonomist. Mr. Hill's professional experience includes performing taxonomic analyses for tribal and US government entities. Mr. Hill participated in the 2010 USEPA Rivers and Streams Assessment, the 2009 and 2014 USEPA National Lakes Assessment, the ongoing Kootenai River Field Sampling and Bioassessment for the Kootenai Tribe initiated in 2002, and the Colville Confederated Tribes' Columbia River Reservoir Morphometrics, Food Web, and Rainbow Trout Fishery Study.

**William J. LaVoie, Fisheries Ecologist/Invertebrate Taxonomist and Macroinvertebrate Project Lead**- Mr. LaVoie joined EcoAnalysts in 2009 as a general taxonomist. He brought with him expertise in aquatic macroinvertebrate taxonomy, salmonid ecology, hydroelectric facilities, fish passage, stream habitat assessment, fish population assessment, periphyton taxonomy, ESA/NEPA documentation (BA, EA, EIS), habitat conservation plans, impact assessments, and watershed planning. His professional experience is split between taxonomic identification and enumeration of aquatic macroinvertebrates, fisheries biology and ichthyoplankton taxonomy, and non-diatom periphyton. He is certified by the Society of Freshwater Sciences (formerly NABS) in EPT-East and West and General Arthropods-East and West.

In addition to five years of experience in environmental consulting, Mr. LaVoie completed seven years of fish passage and transportation related research on the Lower Snake and Columbia Rivers. Mr. LaVoie

has experience as a taxonomy project coordinator overseeing taxonomic protocols, quality control, and data review. Mr. LaVoie has experience writing technical and non-technical proposals, budgets, reports, presenting proposals and research findings, design and construction of research equipment, and considerable field experience. Previously a lead invertebrate and non-diatom periphyton taxonomist with Rhithron Associates, Mr. LaVoie also supervised a wet laboratory and the collection/storage of fish blood and tissue samples. Mr. LaVoie has published numerous unlisted technical reports and six peer-reviewed fisheries research publications. He has also served as a peer-reviewer for two professional journals and served a term as co-chair of the American Fisheries Society Public Visibility Committee.

**Anndrea Navesky, Lead Freshwater Taxonomist** - Anndrea has been with EcoAnalysts since 2012 and has been working in aquatic ecology and identifying aquatic macroinvertebrates for 8 years. Her primary duties at EcoAnalysts are to identify aquatic invertebrates, apart from chironomidae and zooplankton, to the taxonomic level specified by client, usually genus and, to a lesser degree, species. ID macroinvertebrates from regions across the continental US including NW, SW, Mid-West, Southern, SE, NE, Northern as far as Alaska and Canada, and even Hawaii. Anndrea has identified specimens from water bodies including but not limited to streams, lakes, wetlands, and marshes. She has SFS certifications for both eastern and western EPT genera along with eastern and western arthropods.

**John J. Pfeiffer, Aquatic Ecologist/Senior Taxonomist** - Mr. Pfeiffer has been working in aquatic ecology and identifying aquatic macroinvertebrates for over 20 years, 12 years of which have been at EcoAnalysts. His primary duties at EcoAnalysts are: identification of freshwater and marine aquatic macroinvertebrates, supervising and training of taxonomic staff, taxonomic literature research and implementation of taxonomic quality assurance procedures. Mr. Pfeiffer is certified by the Society for Freshwater Science (formerly NABS) in EPT-East and West; and General Arthropods-East and West. Prior to joining EcoAnalysts, Mr. Pfeiffer completed his graduate studies at the University of Idaho where he developed a preliminary bioassessment protocol for mid-order streams in the Palouse Region of Idaho. Concurrent with his studies, he worked part-time for a natural resource consulting company where he was responsible for taxonomy lab supervision and project QA/QC.

**Gregory Wallace, Chironomid Taxonomist** - Greg joined EcoAnalysts in 2008 as a Chironomid Taxonomist. Before joining EcoAnalysts, Greg worked fifteen years for the University of Missouri as a Research Technician in the Department of Fisheries and Wildlife. His responsibilities at the university included a variety of aspects of stream ecology research, primarily collection, laboratory processing and taxonomic identification of aquatic invertebrate samples for projects related to aquatic biomonitoring of Missouri streams. Greg's experience includes collecting and identifying aquatic invertebrates for the Biological Criteria of Missouri Streams project which helped establish biological criteria currently utilized by the Biological Monitoring Unit of Missouri Department of Natural Resources. He utilized MO DNR's semi-quantitative macroinvertebrate sample collection and laboratory processing protocols on subsequent projects and trained a series of co-workers in use of the procedures. Other responsibilities included stream habitat assessment, field reconnaissance of potential study sites, overseeing daily operations of an aquatic laboratory, fish sampling, and contributing to study reports and scientific manuscripts. Greg also worked five years for the Missouri Department of Conservation in the Resource

Science Division identifying aquatic invertebrates for the Resource Assessment and Monitoring Program.

**Kristin Hall, Chironomid Taxonomist** - Ms. Hall joined EcoAnalysts in 2019 as a sorting and field technician and was promoted to chironomid taxonomist in 2022. Ms. Hall obtained her SFS chironomid identification certification in 2023. Ms. Hall obtained her bachelor's degree in environmental science from the University of Idaho. While pursuing her degree, she worked in several labs on-campus where she gained both lab and field experience sorting and identifying macroinvertebrate samples. Ms. Hall went on several research trips to the Frank Church Wilderness where she collected and identified macroinvertebrate samples in the mainstem and tributaries of the Middle Fork of the Salmon River. She also worked as a fisheries field technician where she collected macroinvertebrate samples using drift nets and HESS Samplers in the Lapwai Creek Watershed.

**Laine Smith, Freshwater General Taxonomist** - Mr. Smith joined EcoAnalysts in 2017 as a laboratory and field technician and is currently serving the company as a freshwater taxonomist and a field crew member. Prior to working at EcoAnalysts, Mr. Smith worked on his Ph.D. at the University of Idaho characterizing ground beetle (Coleoptera: Carabidae) populations in Northern Idaho for four years with activities spanning collection, curation, and statistical analysis of beetles. He has a background in forestry and terrestrial entomology, and 15 years' experience in numerous scientific field studies in terrestrial and aquatic ecosystems including at DeLamar Mine and Holden Mine. His duties at EcoAnalysts include freshwater macroinvertebrate taxonomy, quality-control of sorting protocols, and sample collection as a field crewmember.

**Stacy Rice-Marshall, Chironomid Taxonomist** – Ms. Rice-Marshall joined EcoAnalysts in 2021 as a chironomid taxonomist coming in with an extensive background in entomology. Ms. Rice-Marshall obtained her Master of Science in entomology from the University of Idaho in 2022 and her SFS chironomid identification certification in 2023.

**Rob Bobier, Ecological Taxonomy Manager** – Mr. Bobier is Spheros laboratory manager. Mr. Bobier will provide resources as necessary and balance work requirements and laboratory scheduling to ensure timely processing of samples.

**Support Personnel and Certifications.** In addition to the staff members specifically identified for this project, we have additional support staff that will provide additional resources for the project as necessary. We have multiple staff members that are certified to ship and receive hazardous materials, which enables EcoAnalysts to safely and legally ship and receive samples preserved in alcohol according to the Code of Federal Regulations – Title 49 – and the International Air Transportation Association regulations. We are also registered with FedEx to ship hazardous materials.

## Previous Experience

EcoAnalysts, a Spheros company, was founded on freshwater benthic macroinvertebrate processing, enumeration, and identification over 30 years ago. Today, the largest revenue source still comes from this service line. EcoAnalysts also assisted in the development of the Society of Freshwater Science's



(formerly NABS) taxonomic certification program. We strive to have multiple taxonomists certified in each taxonomic group available.

### ***US EPA National Aquatic Resource Surveys (NARS) 2007 – present***

EcoAnalysts has been the preferred taxonomy provider for EPA National Aquatic Resource Surveys (NARS). Since 2007, EcoAnalysts has provided taxonomic identification for each survey for a range of indicators including benthic communities, zooplankton, phytoplankton, sediment diatoms, and wetland vegetation. The table below lists the number of samples of each indicator type we have analyzed since 2007. We are also currently under contract to perform taxonomic identifications on the most recent NARS stream samples.

### ***NEON Benthic Macroinvertebrate Taxonomy 2014-Present***

Since 2014 EcoAnalysts has provided benthic macroinvertebrate and zooplankton taxonomic identification services for the NEON project. On average over 100 samples have been processed annually for this contract. In 2019 we began providing algae taxonomy services. Annual sample numbers have increased each year as the project was being implemented. EcoAnalysts worked in close coordination with members of the NEON team to develop appropriate laboratory and data delivery procedures designed to meet the objectives of the project. Once standard operating procedures were approved, they were implemented for the project. Annual audits were conducted for each taxonomic analysis (benthic invertebrate, zooplankton, periphyton, phytoplankton). All audits were passed, and results are available upon request.

### ***Wetland Studies and Solutions WV/VA benthos 2021***

EcoAnalysts was contracted to process sixty kick samples from wadable streams in West Virginia and Virginia during 2021. Kick samples were rinsed in a 595µm sieve and subsampled to 200 organisms quantitatively. Benthic organisms were identified to the lowest practical taxonomic genus level, with oligochaetes remaining at family. An Index of Biotic Integrity was calculated for the dataset. Data was delivered 30 days after the receipt of each batch of samples.

## **SFS Certifications and Resumes**



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***ANNDREA NAVESKY***

*In recognition of continued excellence in specimen identification for*

***Western General Arthropods***

Dr. Bernard Sweeney

JANUARY 2026

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***ANNDREA NAVESKY***

*In recognition of continued excellence in specimen identification for*

***Eastern Ephemeroptera, Plecoptera and Trichoptera***

Dr. Bernard Sweeney

**JANUARY 2026**

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***ANNDREA NAVESKY***

*In recognition of continued excellence in specimen identification for*

***Eastern General Arthropods***

Dr. Bernard Sweeney

**JANUARY 2026**

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***ANNDREA NAVESKY***

*In recognition of continued excellence in specimen identification for*

***Western Ephemeroptera, Plecoptera and Trichoptera***

Dr. Bernard Sweeney

**JANUARY 2026**

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***CHIP BARRETT***

*In recognition of excellence for specimen identification to Genus for:*

***North American Oligochaeta***

Dr. Bernard Sweeney

APRIL 2030

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***GREG WALLACE***

*In recognition of excellence for specimen identification to Genus for:*

***North American Oligochaeta***

Dr. Bernard Sweeney

APRIL 2030

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***GREG WALLACE***

*In recognition of excellence for image identification to Genus for:*

***North American Chironomidae***

Dr. Bernard Sweeney

APRIL 2030

Date of Expiry





Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***JOHN PFEIFFER***

*In recognition of continued excellence in specimen identification for*

***Eastern General Arthropods***

---

Dr. Bernard Sweeney

**JANUARY 2026**

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***JOHN PFEIFFER***

*In recognition of continued excellence in specimen identification for*

***Western Ephemeroptera, Plecoptera and Trichoptera***

Dr. Bernard Sweeney

JANUARY 2026

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***JOHN PFEIFFER***

*In recognition of continued excellence in specimen identification for*

***Western General Arthropods***

Dr. Bernard Sweeney

JANUARY 2026

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***KRISTIN HALL***

*In recognition of excellence for image identification to Genus for:*

***North America Chironomidae***

Dr. Bernard Sweeney

AUGUST, 2028  
Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***JOHN PFEIFFER***

*In recognition of continued excellence in specimen identification for*

***Eastern Ephemeroptera, Plecoptera and Trichoptera***

Dr. Bernard Sweeney

JANUARY 2026

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***LAINE SMITH***

*In recognition of excellence for image identification to Genus for:*

***Western Ephemeroptera, Plecoptera & Trichoptera***

Dr. Bernard Sweeney

**AUGUST 2028**

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***LAINE SMITH***

*In recognition of excellence for image identification to Genus for:*

***Eastern General Arthropods***

Dr. Bernard Sweeney

APRIL 2030  
Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***LAINE SMITH***

*In recognition of excellence for image identification to Genus for:*

***Western General Arthropods***

Dr. Bernard Sweeney

**APRIL 2030**

Date of Expiry





Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***LAINE SMITH***

*In recognition of excellence for image identification to Genus for:*

***Eastern Ephemeroptera, Plecoptera & Trichoptera***

Dr. Bernard Sweeney

**AUGUST 2028**

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***LAURIE FLAHERTY***

*In recognition of excellence for specimen identification to Genus for:*

***North American Oligochaeta***

Dr. Bernard Sweeney

AUGUST, 2028  
Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***MATT HILL***

*In recognition of excellence for image identification to Genus for:*

***Western General Arthropods***

Dr. Bernard Sweeney

APRIL 2030

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***MATT HILL***

*In recognition of excellence for image identification to Genus for:*

***Western Ephemeroptera, Trichoptera and Plecoptera***

Dr. Bernard Sweeney

**APRIL 2030**

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***MATT HILL***

*In recognition of excellence for image identification to Genus for:*

***Eastern Ephemeroptera, Trichoptera and Plecoptera***

Dr. Bernard Sweeney

**APRIL 2030**  
Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***MATT HILL***

*In recognition of excellence for image identification to Genus for:*

***Eastern General Arthropods***

Dr. Bernard Sweeney

APRIL 2030

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***MICHAEL REUSCHER***

*In recognition of excellence for specimen identification to Genus for:*

***North American Oligochaeta***

Dr. Bernard Sweeney

AUGUST, 2028

Date of Expiry



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year certification is awarded to*

***STACEY RICE-MARSHALL***

*In recognition of excellence for image identification to Genus for:*

***North America Chironomidae***

Dr. Bernard Sweeney

AUGUST, 2028

Date of Expiry





Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***WILLIAM LAVOIE***

*In recognition of continued excellence in specimen identification to genus for*

***Eastern Ephemeroptera, Plecoptera & Trichoptera***

Program Co-Chair

Bern Sweeney

Date of Expiry

April 2026



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***WILLIAM LAVOIE***

*In recognition of continued excellence in specimen identification to genus for*

***Western Ephemeroptera, Plecoptera & Trichoptera***

Program Co-Chair

Bern Sweeney

Date of Expiry

April 2026



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***WILLIAM LAVOIE***

*In recognition of continued excellence in specimen identification to genus for*

***North American Chironomidae***

Program Co-Chair

Bern Sweeney

Date of Expiry

April 2026



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***WILLIAM LAVOIE***

*In recognition of continued excellence in specimen identification to genus for*

***Western General Arthropods***

Program Co-Chair

Bern Sweeney

Date of Expiry

April 2026



Society *for* Freshwater Science

# TAXONOMIC CERTIFICATION

---

*This five year re-certification by Petition is awarded to*

***WILLIAM LAVOIE***

*In recognition of continued excellence in specimen identification to genus for*

***Eastern General Arthropods***

Program Co-Chair

Bern Sweeney

Date of Expiry

April 2026

# Anndrea Navesky

## FRESHWATER INVERTEBRATE TAXONOMIST

EcoAnalysts, Inc.

Moscow, Idaho Location

Ms. Navesky has been working in aquatic ecology and identifying aquatic macroinvertebrates since 2005. Her primary duties at EcoAnalysts are to identify aquatic invertebrates from regions across the continental US including NW, SW, Mid-West, Southern, SE, NE, Northern as far as Alaska and Canada, and even Hawaii. She has identified specimens from all types of water bodies including streams, lakes, wetlands, marshes, etc. She also has ichthyoplankton taxonomy experience. Ms. Navesky is currently the Freshwater Taxonomy Trainer for new taxonomists and has created a freshwater taxonomy handbook to assist them.

## Education

### MASTER OF SCIENCE, ENTOMOLOGY & PLANT PATHOLOGY, 2011

Oklahoma State University, Stillwater, Oklahoma

### BACHELOR OF SCIENCE, BIOLOGY, 2005

University of Central Oklahoma, Edmond, Oklahoma

## Affiliations and Certifications

Society for Freshwater Science Taxonomic Certifications in Eastern & Western EPT, 2021

Society for Freshwater Science Taxonomic Certifications in Eastern & Western Arthropoda, 2021

Oklahoma Academy of Sciences, Member, 2004-2011

American Fisheries Society, OSU Student Sub-unit, Member, 2008-2010

Sanborn Entomology Club, Oklahoma State University, 2008-2011 Vice President, 2008-2009

SCUBA, 2008

BBB Bio Club UCO, 2003-2005

W.E.T. Wetland Education for Teachers, 2004

W.O.W. Wonders of Wetlands, 2004

## Employment History

### FRESHWATER DEPARTMENT LEAD/TRAINER

2020-Current

### ECOANALYSTS, INC.

Moscow, Idaho

Ms. Navesky leads the freshwater team by assuring taxonomy projects are completed on time and within protocol. She is also the Freshwater Taxonomy Trainer for EcoAnalysts and creates the training schedule for new taxonomists, both those hired from outside the company and those laboratory technicians trained up from within the company. Ms. Navesky has also created a freshwater taxonomy handbook for the company and coordinates updates of taxonomic literature into the freshwater library.

### FRESHWATER INVERTEBRATE TAXONOMIST

2012-Current

### ECOANALYSTS, INC.

Moscow, Idaho

Ms. Navesky identifies freshwater macroinvertebrates to species level, terrestrial insects to family, and works with samples from across North America. She is one of the primary taxonomists identifying macroinvertebrates on the National Ecological Observatory Network's freshwater ecosystems project, National Park Service projects, the EPA National Aquatic Resources Survey, Department of Environmental Quality and Fish & Game statewide sampling programs across the US, Tribal projects, coastal surveys, drift samples, fish gut sample analyses, terrestrial projects including pit fall traps and pan traps, etc. Ms. Navesky participates in shaping Standard Taxonomic Efforts for various

projects, trains new hire freshwater taxonomists, serves as a Quality Control Taxonomist, workshop chair for "What is The State of Our Pacific Northwest Unionids?," invited outreach educator for live freshwater invertebrate demonstrations and entomological presentations.

**IPM FIELD TECHNICIAN**

2011

**OSU IPM LABORATORY**

Stillwater, Oklahoma

Conduct Pollinator Surveys in canola fields across Oklahoma for an interdisciplinary biofuel grant. Follow scientific protocol previously set in place, mix and spray various pesticide applications, set up and take down sticky traps, interact with the public, purchase project supplies, work long hours in extreme weather conditions as necessary, navigate backcountry roads, prepare samples for storage, boost morale, etc.

**MASTERS TEACHING/RESEARCH ASSISTANTSHIP OKLAHOMA STATE UNIVERSITY**

2008-2011

Stillwater, Oklahoma

Teaching responsibilities include assisting with ENTO 2003, ENTO 2993, ENTO 4464/5464, and other classes as necessary. Tasks include responding to student emails and questions, prepare materials for all class projects, grade projects and other assignments, enter student grades, prepare exam review sessions, proofread exams, present lecture material when required, put together and organize an aquatic insect teaching collection used for student demonstrations, participate in outreach programs that educate the public about entomology and/or aquatic entomology, set up labs and lab practicals. Research responsibilities include determining short term water quality effects on cattle ponds in Oklahoma rangelands, with and without riparian buffers, whose watersheds are exposed to regularly prescribed fire. Duties include researching and writing sampling methods, collections of aquatic invertebrates, fish and physical/chemical water parameters, identify invertebrates to lowest taxonomic level possible, usually genus, data entry, and to oversee lab workers and field workers. Present data at scientific meetings.

**SCIENCE TECHNICIAN II**

2006-2007

**THE NATURE CONSERVANCY**

Tulsa, Oklahoma

Use Geographic Information Systems to research and compile a list of the healthiest streams in Oklahoma to present to Oklahoma Conservation Commission, sample for macroinvertebrates at TNC properties and identify to genus, participate in annual bison round-up, invited outreach educator for freshwater invertebrates, attend local freshwater conferences, interact with the public, etc.

**FISHERY TECHNICIAN**

2005-2006

**H.B. PARSONS FISH HATCHERY**

Oklahoma City, Oklahoma

Raise various types of fish, perform water quality tests, carry out creel surveys, data entry, interact with the public, conduct gill netting/electro-shocking, answer phone calls, kept up-to-date on fishery information/regulations, assist in projects headed by other state organizations, operate boats and various shop equipment, general upkeep of hatchery building and equipment.

**SUMMER FISHERIES INTERN**

2005

**OK DEPT OF WILDLIFE CONSERVATION – SE FISHERIES DIVISION**

Oklahoma

Carry out Rosgen Level III Surveys of SE Oklahoma streams, data entry, aid in trout stocking, measured/weighed fish, conducted electro-shocking/seining/netting of fish, participate in lakes habitat work, calibrate and maintain field/office equipment, review and summarize scientific literature, streamline Streams file cabinet for easy public access, interact with public.

# John J. Pfeiffer

## INVERTEBRATE TAXONOMIST/AQUATIC ECOLOGIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Mr. Pfeiffer has been working in aquatic ecology and identifying aquatic macroinvertebrates for over 28 years, 25 years of which have been at EcoAnalysts. His primary duties at EcoAnalysts are; identification of freshwater and marine aquatic macroinvertebrates, supervising and training of taxonomic staff, taxonomic literature research and implementation of taxonomic quality assurance procedures.

## Education

### MASTER OF SCIENCE, ENTOMOLOGY, 1998

University of Idaho, Moscow, Idaho

*Thesis: Macroinvertebrate Bioassessment Protocol for the Mid-Order Streams of the Palouse-Camas Prairie Region of Northern Idaho*

### BACHELOR OF SCIENCE, FISHERIES RESOURCE MANAGEMENT, 1995

University of Idaho, Moscow, Idaho

### ASSOCIATE OF APPLIED SCIENCE, FISH & WILDLIFE MANAGEMENT, 1991

Hocking College, Nelsonville, Ohio

## Affiliations and Certifications

Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT)

Society of Freshwater Science Certifications:

Ephemeroptera, Plecoptera, Trichoptera – East, 2021

Ephemeroptera, Plecoptera, Trichoptera – West, 2021

General Arthropods – East, 2021

General Arthropods – West, 2021

## Employment History

### INVERTEBRATE TAXONOMIST/AQUATIC ECOLOGIST      ECOANALYSTS, INC.

1997-Current

Moscow, Idaho

Primary duties at EcoAnalysts are: identification of freshwater and marine aquatic macroinvertebrates, supervising and training of taxonomic staff, taxonomic literature research and implementation of taxonomic quality assurance procedures.

### AQUATIC INVERTEBRATE TAXONOMIST

1997-1998

### NORTHWEST MANAGEMENT

Moscow, Idaho

Identified 500 organism sub-samples of macroinvertebrates for several hundred benthic samples that were part of the 1996 Idaho Department of Environmental Quality Beneficial Use Reconnaissance Program. Identifications were lowest practical for most organisms, family for Chironomidae, and class for Oligochaeta.

## Publications

Sullivan, S.P.; Wisseman R.W.; Pfeiffer, J. 2023. An argument in support of the development of regionalized standard taxonomic efforts for benthic Macroinvertebrate-Based monitoring. Ecological Indicators 149:110184



- Hill, M.A.; Pfeiffer, J; Jacobus, L.M. 2010. A new genus and new species of Baetidae (Ephemeroptera) from lakes and reservoirs in eastern North America. *Zootaxa* 2481:61-68.
- Pfeiffer, J; E. Kosnycki; M. Bilger; B. Marshall; and W. Davis. 2007. Taxonomic Aids for Mid Atlantic Benthic Invertebrates: Baetidae, Capniidae/Leuctridae, and Simuliidae. US Environmental Protection Agency Publication EPA-260-R08-014. 48pp.
- Pfeiffer, J.J., C.A. Robinson and G.T. Lester. 2000. Biological assessment of eight macroinvertebrate sites and a comparison of sampling methods and their influence on support status. EcoAnalysts, Inc. for Montana Department of Environmental Quality.
- Pfeiffer, J.J., C.A. Robinson and G.T. Lester. 1999. 1999 habitat and biological assessments of White Pine, Wepah and Big Sand Creeks. Clearwater National Forest, Orofino, ID.
- Pfeiffer, J.J. and S.M. Lindstrom. 1998. Habitat survey of three tributaries of the Kootenai River, with special reference to kokanee (*Oncorhynchus nerka*) spawning habitat. EcoAnalysts, Inc. for Kootenai Indian Tribe, Bonners Ferry, ID.
- Lester, G.T., J.J. Pfeiffer and S.M. Lindstrom. 1998. Fish and macroinvertebrate survey of Trout Creek, Long Canyon Creek, and Parker Creek: three tributaries of the Kootenai River. EcoAnalysts, Inc. for Kootenai Indian Tribe, Bonners Ferry, ID.
- Pfeiffer, J.J. and C.A. Robinson. 1998. 1998 habitat and biological assessments of White Pine, Wepah and Big Sand Creeks. Clearwater National Forest, Orofino, ID.

# Matthew A. Hill

## MARINE/ZOOPLANKTON TAXONOMY LEAD

EcoAnalysts, LLC

*A Spheros Environmental Company*

Moscow, Idaho Location

Mr. Hill joined EcoAnalysts in 2005. He primarily identifies invertebrates from freshwater, estuarine, and marine environments from across North America, as well as the southern Gulf of Mexico, northern South America, eastern Mediterranean, and western Africa. Other duties include scheduling and coordinating the marine and zooplankton taxonomy teams, reviewing bids on marine and zooplankton projects, field work, report preparation, and teaching classes and workshops.

## Education

### MASTER OF SCIENCE, NATURAL RESOURCES, 2015

University of Idaho, Moscow, Idaho

### BACHELOR OF SCIENCE, ENTOMOLOGY, 2008

University of Idaho, Moscow, Idaho

## Affiliations and Certifications

Society for Freshwater Science (SFS/NABS)

SCAMIT

## Employment History

### MARINE/ZOOPLANKTON TAXONOMY LEAD

### ECOANALYSTS

2018 – Current

Moscow, Idaho

Provides original and QC identifications on freshwater zooplankton and marine benthos samples. Coordinates scheduling, quality checks, and meetings with the marine and zooplankton taxonomy teams. Works with the sales team, reviewing bids on marine and zooplankton projects. Occasional field work, report preparation, outreach, and teaching classes and workshops.

### INVERTEBRATE TAXONOMIST

### ECOANALYSTS

2005 – 2018

Moscow, Idaho

Provide original and QC identifications on freshwater zooplankton, benthos, and marine benthos samples. Occasional field work, report preparation, outreach, and teaching classes and workshops.

## Publications

Rogers, D.C. and M.A. Hill. 2013. Annotated checklist of the large branchiopod crustaceans of Idaho, Oregon, and Washington, USA, with the "rediscovery" of a new species of Branchinecta (Anostraca: Branchinectidae). *Zootaxa* 3694:3, 249–261.

Hill, M.A. and F.M. Merickel. 2011. A new state record of *Bipalium adventitium* Hyman, 1943 (Tricladida: Platyhelminthes) from Idaho, with a key to the species of *Bipalium* known to inhabit the United States. *Transactions of the Idaho Academy of Science*, 47:1, 25-27.

253 original photos in Thorp, J and D. C. Rogers. 2010. *Freshwater Invertebrates of North America*. Burlington, MA: Academic Press.

Hill, M.A., Pfeiffer, J. and Jacobus, L.M. 2010. A new genus and new species of Baetidae (Ephemeroptera) from lakes and reservoirs in eastern North America. *Zootaxa*, 2481:61-68.

Rogers, D. C. and M. Hill, 2008. Key to the Freshwater Malacostraca (Crustacea) of the Mid-Atlantic Region. EPA-230-R-08-017. US Environmental Protection Agency, Office of Environmental Information, Environmental Analysis Division, Washington, DC.

# William J. LaVoie

## TECHNICAL SALES LEAD/INVERTEBRATE TAXONOMIST/FISHERIES BIOLOGIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Mr. LaVoie joined EcoAnalysts in 2009 as a General Taxonomist. He brought with him expertise in aquatic macroinvertebrate taxonomy, salmonid ecology, hydroelectric facilities, fish passage, stream habitat assessment, fish population assessment, periphyton taxonomy, ESA/NEPA documentation (BA, EA, EIS), habitat conservation plans, impact assessments, and watershed planning. His professional experience is split between taxonomic identification and enumeration of aquatic macroinvertebrates, fisheries biology and ichthyoplankton taxonomy, and non-diatom periphyton. In addition to five years of experience in environmental consulting, Mr. LaVoie completed seven years of fish passage and transportation related research on the Lower Snake and Columbia Rivers. Mr. LaVoie has experience as a taxonomy project coordinator overseeing taxonomic protocols, quality control, and data review. Mr. LaVoie has experience writing technical and non-technical proposals, budgets, reports, presenting proposals and research findings, design and construction of research equipment, and considerable field experience. Mr. LaVoie also supervised a wet laboratory and the collection/storage of fish blood and tissue samples. Mr. LaVoie has published numerous unlisted technical reports and six peer-reviewed fisheries research publications. He has also served as a peer-reviewer for two professional journals and served a term as co-chair of the American Fisheries Society Public Visibility Committee.

## Education

### MASTER OF SCIENCE, ZOOLOGY & PHYSIOLOGY (FISHERIES), 1993

University of Wyoming, Laramie, Wyoming

*Thesis title: Habitat use and feeding ecology of young-of-year brown trout in Douglas Creek, Wyoming*

### BACHELOR OF SCIENCE, FISH & WILDLIFE RESOURCES, 1990

Michigan State University, East Lansing, Michigan

## Affiliations and Certifications

Society of Freshwater Science Certifications:

General Arthropods East & West, 2021

EPT East & West, 2021

Chironomidae East & West, 2021

## Employment History

### INVERTEBRATE TAXONOMIST/FISHERIES BIOLOGIST

2009-Present

### ECOANALYSTS, INC.

Moscow, Idaho

Conducts taxonomic identification and enumeration of aquatic macroinvertebrates and larval fish, calculates many different regional and agency Indices of Biotic Integrity (IBI), and is responsible for data and project review prior to data delivery. Currently serves as Taxonomy Freshwater Lead at EcoAnalysts taxonomy laboratory in Moscow, Idaho supervising the freshwater taxonomy department. Lead duties include managing project schedules, ensuring adequate resources are allocated where needed, developing database/reporting tools, as well as innovating laboratory processes for increased data quality, project efficiency and workflow. Also responsible for overseeing taxonomic protocols, assisting with project bids, overall quality control (QC), data review, bioassessment calculations, report writing, assisting proposal development and serves as a fisheries biologist/aquatic ecologist conducting stream habitat surveys, macroinvertebrate sampling, and ESA-required Biological Assessments.

**AQUATIC MACROINVERTEBRATE/PERIPHYTON TAXONOMIST**  
2005-2009

**RHITHRON ASSOCIATES, INC.**  
Missoula, Montana

Taxonomic identification and enumeration of aquatic macroinvertebrates and non-diatom periphyton. I also serve as taxonomy project coordinator overseeing taxonomic protocols, quality assurance, and data review. Data is primarily used to calculate benthic indices of biotic integrity (BIBI) for Clean Water Act compliance and monitoring of surface waters. Samples originate from all regions of the U.S.

**FISHERIES SCIENTIST**  
2001-2005

**PARAMETRIX, INC.**  
Bellevue, Washington

While employed with Parametrix I gained extensive project experience. Representative projects include: Tri-County Model ESA 4(d) Rule Proposal-King County, Seattle, WA where we conducted independent biological review of the Counties' proposed response to the Endangered Species Act 4(d) rule; the Mid-Columbia HCP EIS-Public Utilities Districts of Chelan and Douglas Counties, WA where I assisted in the review, compilation, and response to public and agency comments on an HCP and EIS associated with Rocky Reach, Rock Island, and Wells Dams on the Columbia River; Lake Washington Chinook Salmon Survival Study, Seattle, WA which was conducted a study to assess the survival of outmigrating Chinook salmon smolts passing through the Lake Washington system including a shipping canal lock and dam; AVISTA Cutthroat and Bull Trout Radio-tracking Report which compiled and reported radio-tracking results for a study of adult westslope cutthroat trout and bull trout movement in the Coeur d'Alene and Spokane Rivers; Montana DNRC HCP and EIS-Montana Department of Natural Resources, Missoula, Montana where I contributed to an HCP and EIS for all state-owned forest trust lands in Montana with the goal of protecting habitat and species restoration opportunities for numerous ESA-listed and sensitive fish and wildlife species in a manner compatible with the revenue benefits provided to the State of Montana from timber harvest; USFS and NPS NEPA/ESA Documents - I produced numerous fisheries specialist reports and fisheries portions of ESA and NEPA documentation such as EA chapters and BAs for USFS and NPS projects such as timber sales, mining, and road reconstruction in Washington (Colville NF, North Cascades NP), north Idaho (Panhandle NF), and Arizona (Prescott NF). Projects required stream habitat surveys, fish surveys, data analysis, literature review, and effects analysis of streams within the proposed action areas, with emphasis on sensitive or ESA-listed species. Species included bull trout, white sturgeon, westslope cutthroat, redband trout, riffle sculpin, burbot, spikedace, roundtail chub, and razorback sucker; Other Project-specific Biological Assessments included, Conducted numerous other ESA-required Biological Assessments that were contracted with non-federal agencies in the Lower Puget Sound region. Projects include dam stabilizations, trail construction, sediment dredging, stream habitat restoration, road construction, a WA State Park Master Plan, and marine shoreline restoration projects. ESA-listed species addressed included bull trout, Chinook salmon, steelhead, chum salmon, coho salmon, northern spotted owls, marbled murrelets, bald eagles, as well as Essential Fish Habitat for Pacific salmonids.

**RESEARCH ASSOCIATE**

1994-2001

**UNIVERSITY OF IDAHO, IDAHO COOPERATIVE FISH & WILDLIFE  
RESEARCH UNIT, DEPARTMENT OF FISH & WILDLIFE RESOURCES**  
Moscow, Idaho

For seven years I served as lead research associate and project coordinator conducting research on the effects of lower Snake and Columbia River dam juvenile fish collection facilities on outmigrating chinook salmon and steelhead smolts. Studies assessed the physiological status of barge-transported and in-river migrating juvenile salmonids, and evaluated bypass facilities to improve operations. Duties included planning, conducting, and supervising field/laboratory sampling, hiring and supervising field crews, design of field and experimental research projects, proposal and scope of work preparation/presentation, data management/analysis, literature review, manuscript preparation and review, preparation of presentation graphics, oral presentations of research results, report writing, and supervision of laboratory fish care/water quality facilities. Most data collection required large-scale collection and storage of blood and tissue samples from juvenile salmonids. I was also required to coordinate operations with many federal and state agencies in the Snake and Columbia River basins, including ESA permitting. Acquired extensive working knowledge of PIT-tag detection technology and authored numerous reports.

## Publications

- Congleton, J. L., and W. J. LaVoie. 2001. Comparison of blood chemistry values for samples collected from juvenile Chinook salmon by three methods. *Journal of Aquatic Animal Health* 13: 168–172
- Congleton, J. L., W. J. LaVoie, C. B. Schreck, and L. E. Davis. 2000. Stress indices in migrating juvenile Chinook salmon and steelhead of wild and hatchery origin before and after barge transportation. *Transactions of the American Fisheries Society* 129 (4): 946-961.
- Hubert, W. A., W. J. LaVoie IV, and L. D. DeBray. 1997. Aquatic macroinvertebrates in young beaver ponds on a small prairie stream, Wyoming. *Intermountain Journal of Sciences* 3(1): 11-16.
- LaVoie, W. J., IV, and W. A. Hubert. 1997. Late summer and fall use of stream margins by young-of-year brown trout in a high-elevation stream. *Journal of Freshwater Ecology* 12(2): 291-302.
- Hubert, W. A., W. J. LaVoie IV, and L. D. DeBray. 1996. Densities and substrate associations of macroinvertebrates in riffles of a small, high plains stream. *Journal of Freshwater Ecology* 11(1): 21-26.
- LaVoie, W. J., IV, and W. A. Hubert. 1996. Use of three types of stream-margin habitat by age-0 brown trout late in the growing season. *Hydrobiologia* 317: 89-95.
- LaVoie, W. J., IV, and W. A. Hubert. 1994. Use of drifting invertebrates by young-of-year brown trout in stream-margin habitat. *Journal of Freshwater Ecology* 9(1): 37-43.

# Gregory Wallace

## CHIRONOMIDAE TAXONOMIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Mr. Wallace joined EcoAnalysts in 2008 as a Chironomid Taxonomist. Before joining EcoAnalysts, he worked fifteen years for the University of Missouri as a Research Technician in the Department of Fisheries and Wildlife. His responsibilities at the university included a variety of aspects of stream ecology research, primarily collection, laboratory processing and taxonomic identification of aquatic invertebrate samples for projects related to aquatic biomonitoring of Missouri streams. Mr. Wallace's experience includes collecting and identifying aquatic invertebrates for the Biological Criteria of Missouri Streams project which helped establish biological criteria currently utilized by the Biological Monitoring Unit of Missouri Department of Natural Resources. He utilized MO DNR's semi-quantitative macroinvertebrate sample collection and laboratory processing protocols on subsequent projects and trained a series of co-workers in use of the procedures. Other responsibilities included stream habitat assessment, field reconnaissance of potential study sites, overseeing daily operations of an aquatics laboratory, fish sampling, and contributing to study reports and scientific manuscripts. Mr. Wallace also worked five years for the Missouri Department of Conservation in the Resource Science Division identifying aquatic invertebrates for the Resource Assessment and Monitoring Program.

## Education

### BACHELOR OF SCIENCE, WILDLIFE CONSERVATION & MANAGEMENT, 1993

Missouri State University, Springfield, Missouri

## Affiliations and Certification

Society for Freshwater Science Certifications:

EPT East, 2016  
Chironomidae East, 2016  
Chironomidae West, 2016  
Oligochaeta, 2013

## Employment History

### CHIRONOMIDAE TAXONOMIST

2008-Current

Taxonomic identification of Chironomidae and Oligochaeta. Training of new hires in Chironomidae taxonomy. Preparation and maintenance of in-house Chironomidae taxonomy protocols.

### ECOANALYSTS, INC.

Moscow, Idaho

### RESEARCH TECHNICIAN

1993-2008

Sampling and taxonomic identification of aquatic macroinvertebrates, fish sampling, stream habitat assessment, oversight of aquatics laboratory, training of field and laboratory technicians, project report preparation.

### UNIVERSITY OF MISSOURI, DEPT OF FISHERIES & WILDLIFE

Columbia, Missouri

### RESEARCH ASSISTANT

2004-2008

Identification of aquatic invertebrates for MDC Resource Assessment and Monitoring Program.

### MISSOURI DEPARTMENT OF CONSERVATION

Columbia, Missouri

## Publications

- Rabeni, C. F. and G. S. Wallace. 1998. The influence of flow variation on the ability to evaluate the biological health of headwater streams. In: Kovar K, Tappeiner U, Peters N E, Craig R G, editors. Hydrology, water resources and ecology in headwaters (Proceeding of the Headwater '98 Conference held at Meran/Merano, Italy, April 1998). IAHS Publ. no. 248, 1998. p.411-417.
- Wallace, G.S., W.R.Mabee, and M.D. Combes. 2009. Range Extension of a Nonindigenous Midge, *Polypedilum nubifer* (Diptera: Chironomidae), in North America. *Southeastern Naturalist*. 8(3). pp. 559-562.
- Wallace, G.S., W.R. Mabee, and M.D. Combes. 2009. *Paraboreochlus* (Diptera: Chironomidae): A New Midge Record for Missouri. *Transactions of the Missouri Academy of Science*: Vol.43 (2009), pp. 46-48.
- Wallace, G.S., W.R. Mabee, and M.D. Combes. 2010. *Stilocladius* (Diptera: Chironomidae): A New Midge Record for Wadeable Streams in Missouri. *Transactions of the Missouri Academy of Science*: Vol.44 (2010), pp. 47-49.
- Wallace, G.S., S. W. Lanning, W.R. Mabee, M.D. Combes, J.H. Epler. 2016. New State Records, Habitat Characteristics, and Range Extensions for Three Aquatic Beetles (Coleoptera: Gyrinidae, Hydraenidae) from Wadeable Streams in Missouri, USA. *The Coleopterists Bulletin*. Vol. 70(4), pp.907-910



# Dr. Laurie J. Flaherty

## FRESHWATER OLIGOCHAETE & MARINE POLYCHAETE TAXONOMIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Dr. Flaherty joined EcoAnalysts, Inc. in 2010 as a Sorting Lab Technician, bringing a wide and varied Science background with her (often focused upon water quality issues). Since joining EcoAnalysts, she has taken on various duties including Senior Technician, Algae Lab Technician and Oligochaete worm mounter. Dr. Flaherty enjoys learning taxonomy and is now the primary Freshwater Oligochaete Taxonomist. She is a member of the marine polychaete taxonomy team and is currently learning zooplankton taxonomy.

## Education

### PH.D, ENVIRONMENTAL AND NATURAL RESOURCE SCIENCES, 2002

Washington State University, Pullman, Washington

### MASTER OF SCIENCE, ENVIRONMENTAL SCIENCE, 1994

Washington State University, Pullman, Washington

### BACHELOR OF SCIENCE, GEOLOGY-CUM LAUDE, 1983

Washington State University, Pullman, Washington

## Affiliations and Certifications

Phi Beta Kappa, Liberal Arts Honorary  
Phi Kappa Phi, Science Honorary  
Sigma Gamma Epsilon, Geology Honorary

## Employment History

### OLIGOCHAETE & MARINE POLYCHAETE TAXONOMIST      ECOANALYSTS, INC.

2019 – Current

Moscow, Idaho

Identifies freshwater oligochaetes and marine polychaetes. Serves as the primary Oligochaete taxonomist. Is currently learning zooplankton taxonomy.

### OLIGOCHAETE TAXONOMIST

### ECOANALYSTS, INC.

2014 – 2019

Moscow, Idaho

Identified freshwater oligochaetes and trained on marine polychaete taxonomy. Performed occasional basic algal identifications as needed.

### ALGAE LAB TECHNICIAN

### ECOANALYSTS, INC.

2012 – 2013

Moscow, Idaho

Prepared diatom slides by acid digestion and prepare algal samples as needed for analysis.

### SORTING LAB TECHNICIAN

### ECOANALYSTS, INC.

2010 – 2012

Moscow, Idaho

Sorted macroinvertebrates out of surrounding matrix.

**FIELD TECHNICIAN**

2010

Planted and watered trees for stream restoration projects around Latah County.

**LATAH SOIL & WATER CONSERVATION DIST**

Moscow, Idaho

**BIOLOGY INSTRUCTOR**

2005 – 2010

Taught large Introductory Biology courses for non-Science Majors (600 students per year) as well as occasional Introductory Environmental Science and occasional Statistics and Experimental Design courses for mid-level Biology Majors.

**EASTERN WASHINGTON UNIVERSITY**

Cheney, Washington

**BIOLOGY INSTRUCTOR**

2008 – 2009

Taught General Biology for science and pre-med students Winter quarters (evening class).

**SPOKANE COMMUNITY COLLEGE**

Spokane, Washington

**GRADUATE FIELD & LAB RESEARCH ASSISTANT**

1994 – 2005

Extensive stream and lake sampling experience with weekly sampling (March-November) of Newman and Liberty Lakes, in the Spokane Valley for nearly 10 years.

**WASHINGTON STATE UNIVERSITY**

Pullman, Washington

## Publications

Barry C. Moore, Laurie Flaherty (1996). Fish, Riparian, and Water Quality Issues in the Blue Mountains. In *Search for a Solution: Sustaining the Land, People, and Economy of the Blue Mountains* (pp. 203-242). American Forests in Cooperation with the Blue Mountains Natural Resources Institute.

# Brendan M. “Chip” Barrett, Ph.D.

## FRESHWATER & MARINE TAXONOMIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Dr. Barrett joined EcoAnalysts in 2011 as a Marine Polychaete Taxonomist. His primary responsibilities include taxonomic identification of marine invertebrates and freshwater oligochaetes, quality assurance on identified samples, and the development and growth of the internal marine identification standard operating procedures. Prior to EcoAnalysts, Dr. Barrett has worked extensively in the marine bioassessment field for 25 years, including instructing entry level biology courses at the University of Hawai'i, providing research assistance to the Bishop Museum in Hawai'i, and as a Benthic invertebrate specialist for the Marine Institute, Co. Galway, Ireland

## Education

### PHD, ZOOLOGY, 2010

National University of Ireland Galway, Galway, Co. Galway, Ireland

*Dissertation/Thesis: "A survey of the deep-sea polychaetous annelids of the Porcupine Bank and adjacent areas to the west of Ireland, with particular focus on the phylogeny and taxonomy of the Family Amphinomidae Lamarck, 1818 and Genus Paramphinome M. Sars in G. O. Sars, 1872."*

### MASTER OF SCIENCE, ZOOLOGY, 1999

University of Hawai'i, Honolulu, Hawai'i

*Thesis: "A protocol for studying the mitochondrial DNA of Halocaridina rubra (Holthuis), with application to its conservation and management in the Hawaiian Anchialine habitat."*

### BACHELOR OF ARTS, ZOOLOGY, & MARINE CERTIFICATE IN BIOLOGICAL/BEHAVIORAL SCIENCE, 1992

University of Hawai'i, Honolulu, Hawai'i

## Affiliations and Certifications

Biological Society of Washington

Southern California Association of Marine Invertebrate Taxonomists (SCAMIT)

Society for Freshwater Sciences, Oligochaeta Certification, 2016

## Employment History

### FRESHWATER & MARINE TAXONOMIST

2011 – Current

### ECOANALYSTS, INC.

Moscow, Idaho

Primary responsibilities include taxonomic identification of marine invertebrates, quality assurance on identified samples, and the development and growth of the internal marine identification standard operating procedures. In-house training at EcoAnalysts, Inc. has provided greater experience in the identification of aquatic oligochaetes from various regions of the US leading to the production of data for a number of freshwater benthic projects. Finally, participation in staff training, reference/voucher material curation, internal and external quality control of taxonomic determinations, data management, and statistical analysis is performed as necessary.

### LECTURER, BIOLOGY PROGRAM

August 2009 – December 2010

### UNIVERSITY OF HAWAI'I

Honolulu, Hawai'i

Prepare and present lectures for a section of Biology 171 (Introduction to Biology, Science Majors), Biology 101 (Biology & Society, Non-Science Majors), and Biology 171L (3 sections). In addition, actively teach and engage with

students on a wide variety of topics important to the different courses and assess the progress of individuals of lecture and lab courses.

#### **RESEARCH ASSISTANT**

March 2008 – July 2008

Conduct a literature search for life history information on Hawai'i's exploited reef fishes. The end-product was meant to aid local resource managers identify critical missing life history information needed to better manage reef fishes. The position required a solid understanding of rules of taxonomic nomenclature; familiarity with scientific literature; ability to work independently; perseverance, and attention to detail.

#### **BISHOP MUSEUM**

Honolulu, Hawai'i

#### **SCIENTIST (BENTHIC SPECIALIST)**

October 2006 & October 2003

Served as a scientist assisting in the sorting and identification of fish species sampled during the 2003 and 2006 Irish Groundfish Survey. However, I was primarily responsible for the sorting, identification and collection of biomass data for all non-fish taxa as the Benthic Invertebrate Specialist, as well as preparation of species occurrence lists for each trawl.

#### **MARINE INSTITUTE**

Orenmore, Co. Galway, Ireland

#### **RESEARCH ASSISTANT I AND II**

January 2000 – December 2002

Functional knowledge and understanding of principles, theories, federal and state laws, rules, regulations, systems and associated with work specialty. Supervised the operation of a functional support area assisting program management with configuration/data management implementation and operation. Prepared schedules and coordinating the time spent by staff on projects. Organized and conducted meetings with the lab staff to report on the status of their projects, problems, and progress. I also supervised and trained lab staff as necessary. Reviewed and coordinated the work of clerical personnel, student assistants, and technicians. Processed sediment samples from a soft-bottom benthic biomonitoring program according to U.S. EPA-approved methods, preserved and separated animals found in samples. Recorded and identified species found, entering the information into a database, noting dynamic differences in comparison to regional keys. Performed analysis of data, as well as drafted and edited reports of benthic invertebrate assemblages. Maintained specimen voucher collections, organized notes on specimens to be used for future reference, and gathered literature relevant to the project. Responsible for the care and maintenance of laboratory equipment. Supervised the handling and disposal of hazardous materials according to UH Environmental Health and Safety rules.

#### **UNIVERSITY OF HAWAI'I**

Honolulu, Hawai'i

## **Publications**

Barrett, B. M. (In Preparation). A new species of *Paramphinome* Sars, 1872 from Antarctic waters, and redescription of *P. jeffreysii* and *P. australis*.

Barrett, B. M. (In Preparation). The phylogeny and revision of the genus *Paramphinome* Sars, 1872.

Wagner F. Magalhães, Julie H. Bailey-Brock, and Brendan M. Barrett. 2011. A new species of *Sphaerephesia* (Polychaeta: Sphaerodoridae) from Mamala Bay, south shore of Oahu, Hawaii. *Zootaxa* 2903:39-47.

Longenecker, K., Langston, R., and B. Barrett. 2008. A compendium of life history information for some exploited Hawaiian reef fishes. Final reported prepared for the Fisheries Local Action Strategy, Bishop Museum, Hawaii Biological Survey. Bishop Museum Technical Report No. 44: 67 pp.

Barrett, B. M. & Bailey-Brock, J. H. 2005. *Progoniada oahuensis*, a new species from Oahu, Hawaii (Annelida: Polychaeta: Goniadidae). *Proceedings of the Biological Society of Washington* 118(2): 251-258.

Barrett, B. M. 2005. Taxonomists unaware of history are doomed to repeat it: the history of *Paramphinome jeffreysii* (McIntosh, 1868). *Porcupine Marine Natural History Society Newsletter* 17: 32-33.

Bailey-Brock, J. H., B. Paavo, B. M. Barrett, and J. Dreyer. 2002. Polychaetes associated with a tropical ocean outfall: Synthesis of a biomonitoring program off O'ahu, Hawai'i. *Journal of Pacific Science* 56(4): 459-479.

Barrett, B. M., Paavo, B., Bailey-Brock, J. H., Moretzsohn, F., and Kay, E. A. 2001. Benthic sampling in the vicinity of sewage outfalls off Tanguisson and Agana, Guam, Mariana Islands. Project Completion Report (WRRRC-2001-03), Principle Investigator: Dr. Julie H. Bailey-Brock. Water Resources Research Center, University of Hawai'i, Honolulu, HI 96822. December 2001, 73 p., 22 figs., 9 tbls., 2 app.

# Kristin Hall

## CHIRONOMIDAE TAXONOMIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Ms. Hall obtained her bachelor's degree in environmental science from the University of Idaho. While pursuing her degree, she worked in several labs on-campus where she gained both lab and field experience sorting and identifying macroinvertebrate samples. Ms. Hall went on several research trips to the Frank Church Wilderness where she collected and identified macroinvertebrate samples in the mainstem and tributaries of the Middle Fork of the Salmon River. She also worked as a fisheries field technician where she collected macroinvertebrate samples using drift nets and HESS Samplers in the Lapwai Creek Watershed.

## Education

### BACHELOR OF SCIENCE, ENVIRONMENTAL SCIENCE/FISHERY RESOURCES, 2018

University of Idaho, Moscow, Idaho

## Employment History

### CHIRONOMIDAE TAXONOMIST

2022-Current

### ECOANALYSTS, INC.

Moscow, Idaho

Accurately identify and count chironomids while following projects specific protocols and utilizing a variety of scientific resources such as dichotomy keys and journals. Collaborate with fellow taxonomists and supervisors to meet deadlines. Stay up to date on current research and nomenclature. Problem solve and streamline methods for chironomid identification to increase workflow efficiency and data accuracy. Participate in QC/QA procedures with third party labs and agencies.

### SORTING LAB TECHNICIAN

2019-2022

### ECOANALYSTS, INC.

Moscow, Idaho

Sorting freshwater and marine macroinvertebrates from inorganic and organic substrates, independently and efficiently with minimal supervision, while strictly following project-based protocols and QC processes. Maintaining accurate and organized records of macroinvertebrate counts and project sample data (elutriate and sample volumes, samples matrices). Collaborating with fellow sorting technicians, taxonomists, supervisors, and other lab staff in a professional manner. Following lab safety protocols and maintaining a clean workspace.

### FISHERIES FIELD TECHNICIAN

2018

### UNIVERSITY OF IDAHO KENNEDY LAB

Moscow, Idaho

Observation, capturing, measuring, collecting gut contents, and tagging juvenile steelhead and other stream fishes. Macroinvertebrate collection and preservation using multiple techniques. Measuring stream habitat, including discharge, velocity, temperature substrate and cover. Doing snorkel surveys to observe eating and behavior patterns of juvenile steelhead. Care and maintenance of a broad selection of aquatic sampling gear. Macroinvertebrate sorting and identification (family and genus levels).

### WATER RESOURCES TECHNICIAN

2017-2018

### UNIVERSITY OF IDAHO CAUDILL LAB

Moscow, Idaho

Collect and record data using DOTS and Water Tools Survey. Research freshwater mussel distribution, taxonomy & abundance. Research marine-derived nutrient cycling through freshwater mussels. Collaborate with Indigenous peoples along the Columbia River Basin. Analyze water quality using macroinvertebrate samples (EPT Taxa, Shannon Diversity Index). Analyze freshwater mussel shells (weight, color, length, age). Collecting, sorting, and identifying benthic macroinvertebrate samples (family and genus levels).

# Laine Smith

**FRESHWATER GENERAL TAXONOMIST**  
**FRESHWATER FIELD TEAM LEADER**

EcoAnalysts, Inc.  
Moscow, Idaho Location

Mr. Smith joined EcoAnalysts in 2017 as a laboratory and field technician and is currently serving the company as a freshwater taxonomist and a field team leader. Prior to working at EcoAnalysts, Mr. Smith worked on his Ph.D at the University of Idaho characterizing ground beetle (Coleoptera: Carabidae) populations in Northern Idaho for four years with activities spanning collection, curation, and statistical analysis of beetles. He has a background in forestry and terrestrial entomology, and 17 years' experience in numerous scientific field studies in terrestrial and aquatic ecosystems including at DeLamar Mine and Holden Mine. His duties at EcoAnalysts include freshwater macroinvertebrate taxonomy, and quality-control of sorting protocols. Mr. Smith is also a field team leader for freshwater sample collection (macroinvertebrates and fish) and associated habitat data throughout the Pacific Northwest.

## Education

### **Ph.D. (INCOMPLETE)**

University of Idaho, Moscow, Idaho

*Ground Beetle (Coleoptera: Carabidae) distribution in the Selkirk mountains of Northern Idaho*

### **MASTER OF SCIENCE, FOREST HEALTH, 2010**

School of Forestry, Northern Arizona University, Flagstaff, Arizona

### **BACHELOR OF SCIENCE, FORESTRY, 2007**

School of Forestry, Northern Arizona University, Flagstaff, Arizona

## Affiliations and Certifications

Smith-Root Electrofisher Certification, 2024

Society of Freshwater Science EPT Taxonomic Certification (East/West), 2023

Trained in IDEQ BURP fish & macroinvertebrate field collection methods, 2021

## Employment History

### **FRESHWATER GENERAL TAXONOMIST**

2022 – Current

Macroinvertebrate sample processing – identification/enumeration. Sorting quality-control.

### **ECOANALYSTS, INC.**

Moscow, Idaho

### **FRESHWATER FIELD TEAM LEADER**

2023 – Current

Macroinvertebrate sampling, fish sampling, habitat surveys, fish salvages. Compiled data from field crew and assisted in writing final reports. Responsible for maintaining field equipment readiness and equipment requisitions.

### **ECOANALYSTS, INC.**

Moscow, Idaho

Projects: DeLamar Mine (2023) Macroinvertebrates, fish, and habitat data collection

DeLamar Annual Biomonitoring (2023) Macroinvertebrates and habitat data collection

Kepfler Mine (2023), Macroinvertebrates, fish, and habitat data collection

**FRESHWATER FIELD TECHNICIAN**

2017 – 2023

Macroinvertebrate sampling, fish sampling, habitat surveys, and fish salvage for construction projects. Assisted field team leader with maintaining and storing equipment when not in use. Assisted with data recording and collection.

Projects: DeLamar Mine (2021-2022) Macroinvertebrates, fish, and habitat data collection  
Beartrack Mine (2022), Macroinvertebrates, fish, and habitat data collection  
Bonanza Mine (2020), Fish salvage  
Holden Mine (2019), Macroinvertebrates, fish, and habitat data collection

**ECOANALYSTS, INC.**

Moscow, Idaho

**SORTING LABORATORY TECHNICIAN**

2017 – 2022

Process macroinvertebrate samples from all freshwater and marine habitat. Train incoming technicians and perform quality control checks on all technicians. Morphotype general invertebrates for taxonomists. Complete measurements, wet weights, and dry weights.

**ECOANALYSTS, INC.**

Moscow, Idaho

**Ph.D. RESEARCH**

2010 – 2014

Qualifying ground beetle community diversity in Northern Idaho Insect collection, taxonomy & curation, data analysis, professional presentations.

**UNIVERSITY OF IDAHO**

Moscow, Idaho

**MASTERS' RESEARCH**

2008 – 2010

Assaying insect communities in Douglas-fir Dwarf Mistletoe brooms tree climbing, arthropod taxonomy, statistical techniques.

**NORTHERN ARIZONA UNIVERSITY**

Flagstaff, Arizona

**LABORATORY RESEARCH TECHNICIAN**

2004 – 2008

Bark beetle research (collection, identification/sexing, gallery studies). Misc. studies involving mycangial fungal cultures, aspen regeneration, White Pine Blister Rust, dwarf-mistletoe, flight-intercept trapping, among others.

**NORTHERN ARIZONA UNIVERSITY**

Flagstaff, Arizona

**Publications**

Smith, Laine, Robert Mathiasen, and Richard Hofstetter. "Biomass of Witches' Brooms Caused by Douglas-Fir Dwarf Mistletoe in Northern Arizona." *Journal of the Arizona-Nevada Academy of Science* 43.1(2011): 40-47.

Smith, Laine, Richard Hofstetter, and Robert Mathiasen. "Insect Communities Associated with Douglas-Fir Dwarf Mistletoe Witches' Brooms in Northern Arizona." *The Southwestern Naturalist* 58.4 (2013): 395-402.



# Michael G. Reuscher

## POLYCHAETE TAXONOMIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Dr. Reuscher is a polychaete and oligochaete taxonomist. He joined EcoAnalysts in 2020. Dr. Reuscher identifies polychaetes and oligochaetes from worldwide locations to the lowest possible taxonomic level. He also participates in the quality control of internal and external taxonomists. Other responsibilities include photographing specimens with microscope cameras and wet weight measurements. Dr. Reuscher started his career as a polychaete taxonomist in 2007 during his thesis research on terebellomorph polychaetes at Heidelberg University. He has published 11 peer-reviewed publications in polychaete taxonomy, in which he described more than 30 species and three new genera within the families Ampharetidae, Melinnidae, Paraonidae, Sphaerodoridae, and Terebellidae. For his taxonomic research he has visited numerous natural history museums to study specimens in their respective collections.

Dr. Reuscher was one of the lead taxonomists in a benthic lab at Texas A&M University-Corpus Christi (TAMUCC) between 2011 and 2019. In this position he identified polychaetes from a vast number of samples from the Gulf of Mexico as part of the Deepwater Horizon Natural Resources Damage Assessment (NRDA) and the follow-up Gulf of Mexico Research Initiative (GoMRI). In the benthic lab at TAMUCC, Dr. Reuscher also served as a taxonomy trainer for undergraduate and graduate students. During his time as a Postdoctoral Research Associate and Assistant Research Scientist at TAMUCC, Dr. Reuscher was heavily involved in the data analysis of the spatiotemporal impact of the Deepwater Horizon oil spill on benthic macrofauna in the Gulf of Mexico. Additionally, Dr. Reuscher has been a taxonomic editor for the World Register of Marine Species (WoRMS) since 2012, maintaining data accuracy of the families Ampharetidae and Melinnidae. In 2022 Dr. Reuscher was trained in oligochaete taxonomy by fellow EcoAnalysts taxonomist.

## Education

### Ph.D., MARINE BIOLOGY, 2013

Texas A&M University-Corpus Christi, Corpus Christi, Texas

### DIPLOM (German University degree, equivalent of combined B.S. & M.S.), BIOLOGY, 2008

Heidelberg University, Heidelberg, Germany

## Affiliations and Certifications

Member of Senckenberg Research Society (since 2009)  
Member of Golden Key International Honour Society (since 2009)  
First aid, CPR, and AED certification (2022)  
Scuba Diving (cedip bronze certification, 2003)  
DeepWorker 2000 submersible pilot certification (2009)

## Employment History

### POLYCHAETE TAXONOMIST

2020 – Current

### ECOANALYSTS, INC.

Moscow, Idaho

Identify polychaetes and oligochaetes to the lowest possible taxonomic level. Maintain reference collections. Record abundance data for each taxon and enter data into AEGIS database. Take micrographic pictures of animals and maintain reference photo library. Perform quality control (QC) of other EcoAnalysts taxonomists, as well as external

taxonomists. Reconciliate taxonomic identification with internal and external QC taxonomists. Measure wet weight. Maintain and expand internal taxonomic literature library.

**ADJUNCT FACULTY, DEPT OF LIFE SCIENCES**  
2019 – 2020

**TEXAS A&M UNIVERSITY-CORPUS CHRISTI**  
Corpus Christi, Texas

Teaching of undergraduate Biology classes, including the lecture courses Invertebrate Zoology, Professional Skills, and Senior Presentation. Responsibilities included: developing course syllabus, preparing PowerPoint presentations, composing and grading, class assignments, exams, and quizzes, maintaining office hours, organizing and conducting field trips, leading class discussions, record class attendance, and assigning final grades.

**ASSISTANT RESEARCH SCIENTIST**

**HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES, TEXAS A&M UNIVERSITY-CORPUS CHRISTI**  
Corpus Christi, Texas

2019  
Identification of polychaetes from the Gulf of Mexico as part as part of the Gulf of Mexico Research Initiative (GoMRI), as well as several Texas Bays monitoring projects. Analyzing biodiversity and community structure of macrobenthic invertebrates and the recovery from the impact of oil pollution on these communities. Publishing research articles in peer-reviewed journals.

**POSTDOCTORAL RESEARCH ASSOCIATE**

**HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES, TEXAS A&M UNIVERSITY-CORPUS CHRISTI**  
Corpus Christi, Texas

2014 – 2019  
Identification of polychaetes from the Gulf of Mexico as part of the Natural Resource Damage Assessment (NRDA) in the aftermath of the Deepwater Horizon oil spill and follow-up recovery monitoring as part of the Gulf of Mexico Research Initiative (GoMRI), as well as several Texas Bays monitoring projects. Analyzing biodiversity and community structure of macrobenthic invertebrates and the impact of oil pollution on these communities. Publishing research articles in peer-reviewed journals. Organization of two international workshops and a scientific conference.

**ADJUNCT FACULTY, DEPT OF LIFE SCIENCES**  
2015

**TEXAS A&M UNIVERSITY-CORPUS CHRISTI**  
Corpus Christi, Texas

Teaching of undergraduate Biology lecture course Professional Skills. Responsibilities included: developing course syllabus, preparing PowerPoint presentations, composing and grading homework and exams, maintaining office hours, leading class discussions, record class attendance, and assigning final grades.

**GRADUATE RESEARCH ASSISTANT**

**HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES, TEXAS A&M UNIVERSITY-CORPUS CHRISTI**  
Corpus Christi, Texas

2011 – 2013  
Identification of polychaetes from the Gulf of Mexico as part of the Natural Resource Damage Assessment (NRDA) in the aftermath of the Deepwater Horizon oil spill and follow-up recovery monitoring as part of the Gulf of Mexico Research Initiative (GoMRI), as well as several Texas Bays monitoring projects.

**GRADUATE TEACHING ASST**

**DEPT OF LIFE SCIENCES, TEXAS A&M UNIVERSITY-CORPUS CHRISTI**  
Corpus Christi, Texas

2008 – 2011  
Teaching of undergraduate Biology classes, including the lecture course Professional Skills, the recitation class Genetics, and lab portions of the classes Intro Bio 1, Marine Botany, and Invertebrate Zoology. Responsibilities included: developing course syllabus, preparing PowerPoint presentations, composing and grading homework, class assignments, exams, quizzes, and lab practical, maintaining office hours, organizing and conducting field trips, leading class discussions, record class attendance, lab set-ups, maintaining lab safety standards, instruction of lab methods, supervision of students during hands-on exercises, and assigning final grades.

## STUDENT ASSISTANT

2003 – 2008

Literature search for research articles on enzyme kinetics. Extraction of pertinent data from publication and entry into online database Sabio-RK. Suggest improvements and communicate issues to database developers and bioinformaticians.

## HEIDELBERG INSTITUTE FOR THEORETICAL STUDIES

Heidelberg, Germany

## Publications

### PEER-REVIEWED PUBLICATIONS

- Reuscher, M.G., Baguley, J.G. & Montagna, P.A. (2020) The expanded footprint of the Deepwater Horizon oil spill in the Gulf of Mexico deep-sea benthos. *PLoS ONE* 15(6): e0235167. doi: 10.1371/journal.pone.0235167
- Washburn, T., Reuscher, M.G., Montagna, P.A., Cooksey, C. & Hyland, J.L. (2017) Macrobenthic community structure in the deep Gulf of Mexico one year after the Deepwater Horizon blowout. *Deep-Sea Research Part I* 127: 21-30. doi:10.1016/j.dsr.2017.06.001
- Reuscher, M.G., Baguley, J.G., Conrad-Forrest, N., Cooksey, C., Hyland, J.L., Lewis, C., Montagna, P.A., Ricker, R.W., Rohal, M. & Washburn, T. (2017) Temporal patterns of Deepwater Horizon impacts on the benthic infauna of the northern Gulf of Mexico continental slope. *PLoS ONE* 12 (6): e0179923. doi:10.1371/journal.pone.0179923
- Reuscher, M.G. (2017) Ampharetidae (Annelida: Polychaeta) from the Red Sea reef Al Fahal (Saudi Arabia) with the description of a new species. *Journal of the Marine Biological Association of the United Kingdom* 97 (1): 99-104. doi:10.1017/S0025315416000059
- Montagna, P.A., Baguley, J.G., Hsiang, C.-Y. & Reuscher, M.G. (2017) Comparison of sampling methods for deep-sea infauna. *Limnology and Oceanography: Methods* 15 (2): 166-183. doi: 10.1002/lom3.10150
- Reuscher, M.G. & Shirley, T.C. (2017) Spatial and temporal patterns of benthic polychaete communities on the northern Gulf of Mexico continental slope. *Hydrobiologia* 790 (1): 233-245. doi:10.1007/s10750-016-3034-x
- Reuscher, M.G. & Fiege, D. (2016) Ampharetidae (Annelida: Polychaeta) from cold seeps off Pakistan and hydrothermal vents off Taiwan, with the description of three new species. *Zootaxa* 4139 (2): 197-208. doi:10.11646/zootaxa.4139.2.4
- Reuscher, M.G. (2015) *Amage imajimai*, a new species of Ampharetidae (Annelida: Polychaeta) from Japanese waters. *European Journal of Taxonomy* 154: 1-7. doi:10.5852/ejt.2015.154
- Reuscher, M.G., Fiege, D. & Imajima, M. (2015) Ampharetidae (Annelida: Polychaeta) from Japan. Part IV: miscellaneous genera. *Journal of the Marine Biological Association of the United Kingdom* 95 (6): 1105-1125. doi:10.1017/S0025315415000545
- Reuscher, M.G., Fiege, D. & Imajima, M. (2015) Ampharetidae (Annelida: Polychaeta) from Japan. Part III: the genus *Amphicteis* Grube, 1850 and closely related genera. *Journal of the Marine Biological Association of the United Kingdom* 95 (5): 929-940. doi:10.1017/S0025315414001623
- Reuscher, M.G. & Shirley, T.C. (2014) Diversity, distribution, and zoogeography of benthic polychaetes in the Gulf of Mexico. *Marine Biodiversity* 44 (4): 519-532. doi:10.1007/s12526-014-0222-7
- Zhou, J. & Reuscher, M.G. (2013) Description of a new species of Aricidea (Polychaeta: Paraonidae) from Chinese seas. *Proceedings of the Biological Society of Washington* 126 (3): 276-283. doi:10.2988/0006-324X-126.3.276
- Montagna, P.A., Baguley, J.G., Cooksey, C., Hartwell, I., Hyde, L.J., Hyland, J.L., Kalke, R.D., Kracker, L.M., Reuscher, M. & Rhodes, A.C.E. (2013) Deep-sea benthic footprint of the Deepwater Horizon blowout. *PLoS ONE* 8 (8): e70540. doi:10.1371/journal.pone.0070540
- Imajima, M., Reuscher, M.G. & Fiege, D. (2013) Ampharetidae (Annelida: Polychaeta) from Japan. Part II: Genera with elevated and modified notopodia. *Zootaxa* 3647: 137-166. doi:10.11646/zootaxa.3647.1.7
- Imajima, M., Reuscher, M.G. & Fiege, D. (2012) Ampharetidae (Annelida: Polychaeta) from Japan. Part I: The genus *Ampharete* Malmgren, 1866, along with a discussion of several taxonomic characters of the family and the introduction of a new identification tool. *Zootaxa* 3490: 75-88.
- Reuscher, M., Fiege, D. & Wehe, T. (2012) Terebellomorph polychaetes from hydrothermal vents and cold seeps with the description of two new species of Terebellidae (Annelida: Polychaeta) representing the first

- records of the family. *Journal of the Marine Biological Association of the United Kingdom* 92 (5): 997-1012. doi:10.1017/S0025315411000658
- Reuscher, M. & Fiege, D. (2011) Sphaerodoridae (Annelida: Polychaeta) from the deep South West Pacific, with the description of a new species of *Sphaerodoropsis* Hartman & Fauchald, 1971. *Journal of the Marine Biological Association of the United Kingdom* 91 (2): 439-445. doi:10.1017/S0025315410000469
- Reuscher, M., Fiege, D. & Wehe, T. (2009) Four new species of Ampharetidae (Annelida: Polychaeta) from Pacific hot vents and cold seeps, with a key and synoptic table of characters for all genera. *Zootaxa*, 2191: 1-40.

#### BOOK CHAPTERS

- Montagna, P.A., Baguley, J.G., Reuscher, M.G., Rowe, G.T. & Wade, T.L. (2020) Linking Abiotic Variables with Macrofaunal and Meiofaunal Abundance and Community Structure Patterns on the Gulf of Mexico Continental Slope. In: Murawski, S. et al. (eds.) *Scenarios and Responses to Future Deep Oil Spills*, pp. 109-131. Cham: Springer. doi:10.1007/978-3-030-12963-7\_7
- Reuscher, M.G., Montagna, P.A. & Sturdivant, S.K. (2019) Sampling techniques for the marine benthos. In: Cochran JK, Bokuniewicz HJ & Yager PL (eds.) *Encyclopedia of Ocean Sciences*, 3rd Edition, vol. 2, pp. 752-764. Oxford: Elsevier. doi:10.1016/B978-0-12-409548-9.10987-X

#### REPORTS, CHAPTERS, AND OTHER PUBLICATIONS

- Reuscher, M.G. (2019) Workshops at Texas A&M University-Corpus Christi advance cutting-edge research for marine environmental impact studies. *Third Coast Science* 4: 10-11.
- Reuscher, M.G. (2018) 2nd Benthic invertebrate taxonomy, metagenomics and bioinformatics (BITMaB-2) workshop 2018. Final report for the Gulf of Mexico Alliance, Gulf of Mexico Research Initiative (GoMRI) project 16-052. Harte Research Institute for Gulf of Mexico Studies, Corpus Christi, TX, 23pp.
- Reuscher, M.G. (2017) Benthic invertebrate taxonomy, metagenomics and bioinformatics (BITMaB) workshop 2017. Final report for the Gulf of Mexico Alliance, Gulf of Mexico Research Initiative (GoMRI) project 16-052. Harte Research Institute for Gulf of Mexico Studies, Corpus Christi, TX, 15pp.
- Reuscher, M. (2013) Biodiversity, ecology, and natural history of polychaetous annelids of the Gulf of Mexico. Dissertation. Texas A&M University-Corpus Christi, xvi 246 pp.
- Reuscher, M., Fiege, D. & Wehe, T. (2010) *Amphisamytha vanuatuensis* Reuscher, Fiege & Wehe, 2009. In: Morineaux, M., Baker, M., Ramirez-Llodra, E. & Desbruyères, D. (eds.). DVD of deep-sea hydrothermal vent fauna. ChEss and Ifremer.
- Reuscher, M., Fiege, D. & Wehe, T. (2010) *Anobothrus apaleatus* Reuscher, Fiege & Wehe, 2009. In: Morineaux, M., Baker, M., Ramirez-Llodra, E. & Desbruyères, D. (eds.). DVD of deep-sea hydrothermal vent fauna. ChEss and Ifremer.
- McKenna, S.A., Lash, J., Morgan, L., Reuscher, M., Shirley, T., Workman, G., Driscoll, J., Robb, C., & Hangaard, D. (2009) Finding Coral Expedition. Cruise Report. Living Oceans Society, 52 pp.
- Reuscher, M. (2007) Deep-sea polychaetes of the Pacific and Atlantic Oceans with particular consideration of the fauna from hot vents and cold seeps. Thesis. Heidelberg University, 128 pp. [In German]

# Stacey Rice-Marshall

## CHIRONOMIDAE TAXONOMIST

EcoAnalysts, Inc.  
Moscow, Idaho Location

Mrs. Rice-Marshall joined the team of aquatic scientists at EcoAnalysts, Inc. in 2021 as a Chironomidae Taxonomist. In this position, she identifies Chironomidae specimens from water bodies across North America while ensuring protocol for each client is followed. Accurate assessment of abundance and richness are made for each project, while deadlines are met for data delivery. She is a member of the Society for Freshwater Science and the Entomological Society of America. Before joining the EcoAnalysts team, Mrs. Rice-Marshall worked as a researcher and project coordinator with economically important insect species in forest entomology and forest health protection, studying how biochar affects insects and other invertebrates. She also worked to understand and document the biology and dispersal of invasive insects in agricultural systems. She has a background in pollinator ecology as well as several years of experience working with aquatic invertebrates in rice crops. Her love of insects translates to her enthusiasm with her team members.

## Education

### **M.S. ENTOMOLOGY, 2022**

University of Idaho, Moscow, Idaho

### **B.S. BIOLOGICAL SCIENCES, 2015**

University of California-Davis, Davis, California

*Minor: Medical-Veterinary Entomology*

### **A.S. BIOLOGICAL SCIENCES, 2007**

Sierra College, Rocklin, California

### **A.S. LIFE SCIENCES, 2007**

Sierra College, Rocklin, California

### **A.A. LIBERAL ARTS, 2007**

Sierra College, Rocklin, California

## Affiliations and Certifications

|                                  |              |
|----------------------------------|--------------|
| Society for Freshwater Science   | 2022-Current |
| Entomological Society of America | 2014-Current |
| Graduate Women in Science        | 2019-2021    |

## Employment History

### **CHIRONOMIDAE TAXONOMIST**

2021 – Current

### **ECOANALYSTS, INC.**

Moscow, Idaho

As a taxonomist, Mrs. Rice-Marshall enjoys processing Chironomidae samples from North America while ensuring individual protocol for each client is followed. Her responsibilities involve the accurate identification of Chironomidae to genus/species, and assessment of abundance and richness of taxa for each project, while deadlines

are met for data delivery. Reference collections are created upon request from the client. She assists with microscopic photography and preserving and organizing specimens in reference collections for quality control and archival purposes. During field season, Mrs. Rice-Marshall becomes a stream technician to assist in collecting benthic samples for our routine bioassessment monitoring projects.

**GRADUATE STUDENT RESEARCHER**

**UNIVERSITY OF IDAHO DEPT OF ENTOMOLOGY,  
PLANT PATHOLOGY AND NEMATOLOGY**

2017 – 2021

Moscow, Idaho

Mrs. Rice-Marshall's experience involved planning, setting up, and conducting simultaneous field, lab and greenhouse-based research projects associated with forest insects and forest health protection. These projects included visual detection, monitoring, collection, preservation, identification, and management of forest insects, as well as rearing, feeding and maintenance of insect colonies for experimental use (such as mountain pine beetle, red turpentine beetle, Douglas-fir tussock moth, western spruce budworm, etc.). Routine surveys of forest insects (and other invertebrates) were performed using various pheromone-baited and non-baited trapping methods. Measuring stand density and environmental data from field sites allowed me to use ArcMap GIS software to create maps of field sites. Experienced with mentoring and training undergraduate research associates, frequently overseeing data collection and sample processing in field, greenhouse, and laboratory. Data was accurately collected, analyzed, and interpreted for multiple manuscript publications.

**GRADUATE TEACHING ASSISTANT**

**UNIVERSITY OF IDAHO DEPT OF ENTOMOLOGY,  
PLANT PATHOLOGY AND NEMATOLOGY**

Fall 2020

Moscow, Idaho

Assisted the professor with online instruction of "Introduction to Forest Insects" entomology course, including creating assignments and grading rubrics, grading assignments, and posting grades to online classroom platform (BbLearn). Experience communicating and engaging with students, including tutoring students who attended weekly virtual office hours and assisting with communications in online BbLearn classroom platform/streamlining online content for all students (Microsoft Stream), including providing access for hearing-impaired.

**VOLUNTEER (AS PART OF GRADUATE RESEARCH)**

**USDA FOREST SERVICE ROCKY MOUNTAIN  
RESEARCH STATION**

2018 – 2020

Moscow, Idaho

In affiliation with the USDA Forest Service, Mrs. Rice-Marshall surveyed, preserved and identified insects in a biochar-amended forest site in Arnold, CA (as part of a larger project lead by Dr. Dumroese). Volunteered as a greenhouse research collaborator for a multiple-year study on effects of biochar-amended soil on Douglas-fir and grand fir seedling stress, while creating a fertilization schedule for 120 Douglas-fir seedlings and 120 grand fir seedlings based on field water capacity. Experienced with multiple forestry site sampling and measurement tools and Scholander bomb pressure chamber equipment for measuring water potential.

**JUNIOR RESEARCH SPECIALIST**

**UNIVERSITY OF CALIFORNIA DAVIS DEPT OF  
ENTOMOLOGY AND NEMATOLOGY**

2015 – 2017

Davis, California

In this position, Mrs. Rice-Marshall designed, set up and conducted field, lab, and greenhouse-based entomological research. Supported research on determining the efficacy of non-toxic methods of integrated pest management in aquatic rice fields (surveying for aquatic and semi-aquatic invertebrates, and toxicity assays) along with the collection, analysis, summary, and interpretation of data. Maintained multiple native and invasive species of insects for experimental purposes, prepared maintained and safely used and disposed of laboratory chemicals (solutions, reagents, etc.) and equipment used in the laboratory, field, and greenhouse. Participated in the biological control of greenhouse insect pests, while cultivating and maintaining multiple plant species in the laboratory and greenhouse. Responsible for the instruction and supervision of undergraduate research assistants.

**UNDERGRADUATE STUDENT RESEARCH ASSISTANT****UNIVERSITY OF CALIFORNIA DAVIS DEPT OF ENTOMOLOGY AND NEMATOLOGY**

2013 – 2015

Davis, California

As an undergraduate researcher, Mrs. Rice-Marshall supported field, lab, and greenhouse-based research for the Godfrey laboratory. This included research of integrated pest management of insects in field and vegetable crops, the identification of specific and non-target macro and microscopic insects (terrestrial and aquatic) in a flooded rice field (Rice water weevil, tadpole shrimp, Chironomidae, Culicidae, etc.), and the management and organization of laboratory inventory, including chemicals (solutions and reagents) and laboratory equipment.

**VOLUNTEER RESEARCH ASSISTANT****HARRY H. LAIDLAW JR. HONEY BEE RESEARCH FACILITY**

2014

Yolo County, California

Along with a team, Mrs. Rice-Marshall was responsible for the inspection and maintenance of over 200 *Apis mellifera* (honeybee) colonies throughout Yolo County, CA. Assisted with honey extraction, feeding, treating varroa mite infestation, monitoring for colony disorders and disease, and organizing all equipment and tools. Assisted with research on gene expression and behavioral changes of queen bees and collected several hundred bees for administration of anesthesia and/or insemination.

**VOLUNTEER RESEARCH ASSISTANT****NATIONAL PARK SERVICE, ALCATRAZ ISLAND**

2015 – 2016

San Francisco, California

Helped to design, set up, and conduct field monitoring of Pacific Powderpost Beetle for a multiple-year biological assessment and management project. Lead a team to distribute sentinel monitoring devices, while creating a map to record the locations of each device. Assisted with data collection and interpretation for official NPS reports.

## Publications

**Rice-Marshall, S.**, S. P. Cook, J. Randall. 2021. Impact of biochar on Douglas-fir tussock moth, *Orgyia pseudotsugata* (Lepidoptera: Erebididae) larvae reared on synthetic diet. *Insects*. doi: [10.3390/insects12121065](https://doi.org/10.3390/insects12121065)

**Rice-Marshall, S.** S.P. Cook, J. Randall. 2022. Does biochar alter insect utilization of downed ponderosa pine trees? Manuscript in process.

S. P. Cook, **S. Rice-Marshall**, L. Leblanc, D. Page-Dumroese. Effects of biochar on forest invertebrates in a post-harvest site in the Stanislaus National Forest, California. Manuscript in process.

Agachee, M. A., **S. Rice**, J. Milnes, L. Godfrey. Is *Halyomorpha halys* (Hemiptera: Pentatomidae) a threat to California rice? *Crop Protection* 111. September 2018.

I. Grettenberger, **S. Rice**, S. Joseph, L. Godfrey. Where to oviposit: influence of host plants on *Bagrada hilaris* (Hemiptera: Pentatomidae) oviposition site selection. Submitted.

Bloese, J., **S. Rice**, K. Goding, L. Godfrey. A collaborative approach to integrated pest management of tadpole shrimp in California rice fields. *Simply Sustainable*. SARE. Logan, UT. 2016.

**Rice, S. J.** Carey, L. Kimsey, E. Lewis. 2013. *One Minute Entomology Videos*. 2013

- <https://www.youtube.com/watch?v=nkqNB-qqq3o>
- [https://www.youtube.com/watch?v=LhHxYrl6Lfs&list=PLq4\\_hV3qSh8Pqnlh339Gd3oDDIH0YpFHO](https://www.youtube.com/watch?v=LhHxYrl6Lfs&list=PLq4_hV3qSh8Pqnlh339Gd3oDDIH0YpFHO)

# Spheros Proposal for WV DEP Benthic Macroinvertebrates 2025

Final Audit Report

2025-11-11

|                 |                                             |
|-----------------|---------------------------------------------|
| Created:        | 2025-11-11                                  |
| By:             | Megan Payne (mpayne@ecoanalysts.com)        |
| Status:         | Signed                                      |
| Transaction ID: | CBJCHBCAABAAgfaDfBS3HHP5O-_uLJQ6hAP4kN2gzXK |

## "Spheros Proposal for WV DEP Benthic Macroinvertebrates 2025" History

-  Document created by Megan Payne (mpayne@ecoanalysts.com)  
2025-11-11 - 9:54:59 PM GMT
-  Document emailed to Joseph Miller (jmiller@fourpeaksenv.com) for signature  
2025-11-11 - 9:55:18 PM GMT
-  Email viewed by Joseph Miller (jmiller@fourpeaksenv.com)  
2025-11-11 - 10:20:29 PM GMT
-  Document e-signed by Joseph Miller (jmiller@fourpeaksenv.com)  
Signature Date: 2025-11-11 - 10:22:08 PM GMT - Time Source: server
-  Agreement completed.  
2025-11-11 - 10:22:08 PM GMT