Supplemental Materials

for

“Zooming” Our Way through Virtual Undergraduate Research Training: A Successful Redesign of the CONSERVE Summer Internship Program

Leena Malayil1, Masoud Negahban-Azar2, Rachel Rosenberg Goldstein1, Manan Sharma3, Jeanne Gleason4, Amy Muise4, Rianna Murray1, and Amy R. Sapkota1*

1Maryland Institute for Applied Environmental Health, University of Maryland School of Public Health, College Park, MD 20742; 2Department of Environmental Science and Technology, University of Maryland, College Park, MD 20740; 3United States Department of Agriculture, Agricultural Research Service, Beltsville Agricultural Research Center, Environmental Microbial and Food Safety Laboratory, Beltsville, MD 20705; 4New Mexico State University, Department of Innovative Media Research and Extension, Las Cruces, NM 88003

Table of Contents
(Total pages 7)

Appendix 1: CONSERVE summer internship positions, schedule, and curriculum

*Corresponding author. Mailing address: University of Maryland School of Public Health, 4200 Valley Drive, Room 2234P, College Park, MD 20742.
Phone: 301-405-1772. E-mail: ars@umd.edu.
Received: 19 January 2021, Accepted: 24 January 2021, Published: 31 March 2021

©2021 Author(s). Published by the American Society for Microbiology. This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial-NoDerivatives 4.0 International license (https://creativecommons.org/licenses/by-nc-nd/4.0/ and https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode), which grants the public the nonexclusive right to copy, distribute, or display the published work.
CONSERVE Summer Internship Position Descriptions

New Mexico State University: Dr. Jeanne Gleason and Amy Muise

Position Description: CONSERVE interns working with New Mexico State University will support, promote and enhance online distribution of educational materials related to water, microbial contamination and irrigation, including the CONSERVE Water Sampling and Water Testing interactive modules.

The mentors will guide interns in:
- Writing marketing copy about educational products
- Posting about the products on educational websites and distribution hubs
- Reaching out to teacher listservs, state Extension/4-H and other educational groups
- Testing accessibility features of the interactive modules
- Social media strategy and implementation

As part of social media efforts, interns will collaborate (via Zoom) with a small group of undergraduate and graduate students working on NMSU-affiliated grant projects related to water, to share ideas and strategies.

University of Maryland: Dr. Masoud Negahban-Azar

Position Description: The intern will gain hands on experience in geospatial data collection and analysis. He/she will help with the data collection and processing and will work in developing the GIS platform of alternative water sources for agricultural irrigation. The intern will be exposed to large-scale hydrological modeling and optimization techniques. He/she will also be part of a team developing decision support systems for water reuse in agriculture.

University of Maryland: Dr. Rachel Goldstein, Dr. Leena Malayil and Dr. Amy R. Sapkota

Position Descriptions: The mentors will guide interns in two different projects:

1. RRIPER (Rooftop Runoff Irrigating Produce Eaten Raw): Extension Publication and Project Planning

Using alternative water sources is increasingly important as we face a global water crisis. It is crucial that every drop of water be used wisely, including water that falls as rain or runs off our roofs. Despite the abundance of rainwater barrels in use in Maryland, gardeners have previously been advised against using harvested rainwater or rooftop runoff to irrigate gardens because of water quality and food safety concerns. However, studies on the microbial and chemical quality of harvested rainwater or rooftop runoff are limited and contradictory.

For this 2020 CONSERVE intern project the student will:
- Conduct an in-depth literature review for relevant studies evaluating the quality of collected rainwater or rooftop runoff.
- Draft text for an Extension publication to explain what current research findings tell us about the safety of using collected rainwater or rooftop runoff and where the knowledge gaps are.
- Design figures for the Extension publication.
- Assist in planning future field testing for the RRIPER project.
2. Optimizing Urban Garden Water Sources: Community Garden Survey Distribution and Analysis

Urban gardens can provide communities with access to fresh and safe food, serve as green spaces and make use of otherwise wasted water. This study seeks to determine the safety of using harvested rainwater and rooftop runoff in vegetable gardens in Baltimore City. In addition to field sampling and lab analysis of collected water, soil, and produce samples at a later date, we are currently developing and distributing a survey among Baltimore urban farmers and gardeners about garden water sources.

For this 2020 CONSERVE intern project the student will:
- Assist in finalizing the needs assessment survey for Baltimore City urban farmers and gardeners.
- Design promotional materials to encourage survey participation.
- Distribute the survey through multiple online and social media outlets.
- Analyze survey results.

USDA Agricultural Research Service: Dr. Manan Sharma

Position Description: The CONSERVE summer internship at USDA ARS EMFSL will be a novel as it transitions to an online learning experience for students in 2020. Students will be guided in their independent learning focusing on reducing pathogens in surface irrigation water through filtration techniques involving sand and zero-valent iron. Data collected in 2019 will be analyzed this summer. The influence of 1) influent water, 2) ZVI/sand composition, and 3) specific physical and chemical characteristics of water will be determine and correlated with observed reductions of the bacterial fecal indicator Escherichia coli. Student will refine and develop data organization skills. Interns will be asked to write a report in the format of a preliminary peer-reviewed manuscript for submission to a scientific journal.
CONSERVE Summer Internship (SIP) Schedule and Curriculum

Week of June 15th – Orientation Week

| Date   | Time           | Presenter                                                                 |
|--------|----------------|----------------------------------------------------------------------------|
| June 15| 12:00-12:30    | Dr. Amy R. Sapkota (Overview of CONSERVE Center)                           |
|        | 12:30-12:40    | Questions                                                                 |
|        | 12:40-12:50    | Break                                                                     |
|        | 12:50-1:15     | Dr. Leena Malayil (Expectations and goals for SIP 2020)                    |
| June 16| 12:00-12:20    | CONSERVE Collaborator                                                       |
|        | 12:20-12:30    | Questions                                                                 |
|        | 12:30-1:00     | Break                                                                     |
|        | 1:00-1:20      | CONSERVE Collaborator                                                       |
|        | 1:20-1:30      | Questions                                                                 |
|        | 1:30-1:40      | Break                                                                     |
|        | 1:40-2:15      | 10-minute Lightning rounds: Introductions by interns (2 interns)           |
| June 17| 12:00-12:20    | Dr. Manan Sharma                                                           |
|        | 12:20-12:30    | Questions                                                                 |
|        | 12:30-1:00     | Break                                                                     |
|        | 1:00-1:20      | Dr. Rachel Goldstein                                                       |
|        | 1:20-1:30      | Questions                                                                 |
|        | 1:30-1:40      | Break                                                                     |
|        | 1:40-2:15      | 10-minute Lightning rounds: Introductions by interns (2 interns)           |
| June 18| 12:00-12:20    | Dr. Masoud Negahban-Azar                                                   |
|        | 12:20-12:30    | Questions                                                                 |
|        | 12:30-1:00     | Break                                                                     |
|        | 1:00-1:20      | Dr. Jeanne Gleason                                                         |
|        | 1:20-1:30      | Questions                                                                 |
|        | 1:30-1:40      | Break                                                                     |
|        | 1:40-2:15      | 10-minute Lightning rounds: Introductions by interns (3 interns)           |
| June 19| 1:00-1:20      | CONSERVE Collaborator                                                       |
|        | 1:20-1:30      | Questions                                                                 |
|        | 1:30-3:00      | Break                                                                     |
|        | 3:00-3:20      | CONSERVE Collaborator                                                       |
|        | 3:20-3:30      | Questions                                                                 |
Week of June 22nd – Project Development Week (Brainstorming)

Mentor and Intern Matches

University of Maryland
Mentor - Dr. Masoud Negahban-Azar
  • Intern 1
  • Intern 2

New Mexico State University
Mentors - Dr. Jeanne Gleason/ Amy Muise
  • Intern 3
  • Intern 4

University of Maryland and USDA Agricultural Research Service
Mentors - Dr. Rachel Goldstein/ Dr. Manan Sharma/ Dr. Amy Sapkota/ Dr. Leena Malayil
  • Intern 5
  • Intern 6
  • Intern 7

Week of June 29th- Week of July 27th - Interns Work on Assigned Research/Extension Projects

Week of August 3rd – Interns Work on Final Presentations of Their Summer Work

Professional Development Webinars: Wednesdays, 12:00-1:00 pm

| Date   | Presenter-                                            | Topic                                                        |
|--------|-------------------------------------------------------|--------------------------------------------------------------|
| June 24| University of Maryland (UMD) newly admitted graduate students and Dr. Amy Sapkota | How to apply to graduate school                               |
| July 1 | UMD Faculty                                           | Introduction to group dynamics                               |
| July 8 | UMD Career Center                                    | Resume/CV building                                           |
| July 15| UMD Career center                                    | Job interview skills and informational networking            |
| July 22| CONSERVE postdoctoral fellows and graduate students   | Insight into scientific conferences, networking, posters     |
| July 29| Dr. Amy R. Sapkota                                   | How to create an effective PowerPoint presentation           |
| August 5| Interns                                               | Final presentations of summer projects                       |
### Weekly Journal Article Discussions

**Mondays – Journal article will be provided**

**Fridays, 12:00-1:00pm – Journal article discussions** (NOTE: Presenters are required to use PowerPoint slides)

| Date      | Presenter         | Discussion papers                                                                                                                                 |
|-----------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| June 26   | Intern 1          | Goldstein RR, Kleinfelter L, He X, Micallef SA, George A, Gibbs SG, Sapkota AR. 2017. Higher prevalence of coagulase-negative staphylococci carriage among reclaimed water spray irrigators. Science of the Total Environment 595:35-40 |
|           | Intern 2          |                                                                                                                                                |
| July 3    | Intern 3          | Panthi S, Sapkota AR, Raspanti G, Allard SM, Bui A, Craddock HA, Murray R, Zhu L, East C, Handy E, Callahan MT, Haymaker J, Kulkarni P, Anderson B, Craighead S, Gartley S, Vanore A, Betancourt WQ, Duncan R, Foust D, Sharma M, Micallef SA, Gerba C, Parveen S, Hashem F, May E, Kniel K, Pop M, Ravishankar S, Sapkota A. 2019. Pharmaceuticals, herbicides, and disinfectants in agricultural water sources. Environmental Research 174:1-8 |
|           | Intern 4          |                                                                                                                                                |
| July 10   | Intern 5          | Kecinski M, Messer KD. 2018. Mitigating Public Concerns About Recycled Drinking Water: Leveraging the Power of Voting and Communication. Water Resources Research 54:5300–5326 |
|           | Intern 6          |                                                                                                                                                |
|           | Intern 7          |                                                                                                                                                |
| July 17   | Intern 1          | Gerba CP, Betancourt WQ, Kitajima M. 2017. How much reduction of virus is needed for recycled water: A continuous changing need for assessment? Water Research 108:25-31 |
|           | Intern 2          |                                                                                                                                                |
| July 24   | Intern 3          | Allard SA, Callahan MT, Bui A, Ferelli AMC, Chopyk J, Chattopadhyay S, Mongodin EF, Micallef SA, Sapkota AR. 2019. Creek to Table: Tracking fecal indicator bacteria, bacterial pathogens, and total bacterial communities from irrigation water to kale and radish crops. Science of the Total Environment 666:461-471 |
|           | Intern 4          |                                                                                                                                                |
| July 31   | Intern 5          | Rock CM, Brassill N, Dery JL, Carr D, McLain JE, Bright KR, Gerba CP.2019. Review of water quality criteria for water reuse and risk-based implications for irrigated produce under the FDA Food Safety Modernization Act, produce safety rule. Environmental Research 172:616-629 |
|           | Intern 6          |                                                                                                                                                |
|           | Intern 7          |                                                                                                                                                |

### Professional Writing Workshop

University of Maryland Professional Writing Faculty (Thursdays, 12:00-1:30pm)

| Date      | Topic                                                                 |
|-----------|-----------------------------------------------------------------------|
| June 25   | Introduction and career path                                          |
| July 2    | Introduction Methods Results and Discussion (IMRaD) Part 1-Introduction section of a manuscript |
| July 9    | IMRaD Part 2-Methods and results section of a manuscript              |
| July 16   | IMRaD Part 3-Discussion section of a manuscript                        |
| July 23   | Overview of the publication process                                   |
| July 30   | Writing science in plain English                                       |
Guidelines for Interns

- Interns are expected to keep a work log google sheet (example provided in the modules) to monitor their work which needs to be shared with Dr. Leena Malayil and the respective mentors.
- Interns are to schedule virtual meetings with their corresponding project coordinators at least once every week to discuss if they have any concerns or exciting results to share (record this on the work log google sheet)
- Interns are required to attend all webinars: Orientation week presentations, Wednesdays (Professional development webinars), Professional writing workshop, Friday (Journal article discussion)
- The final presentations are required by the Interns

Guidelines for PIs and Project Coordinators

- A weekly virtual meeting (20-30 minutes) with the interns is required to ensure that projects are moving forward and to address any challenges that may arise
- Sign off on weekly intern work logs in google sheets
- Involve the interns in your weekly lab/group meeting (if applicable)