Mississippi Water Resources Research Institute

Annual Technical Report
2018
WRRI General Reports: General Information

Email Address: Jessie Schmidt
Institute: Mississippi

Products: 2017MS - ADMIN

Administration: (all publications are posted at www.wrri.msstate.edu)
MWRRI E-Newsletter, Spring, 2018, 8 pages.
MWRRI E-Newsletter, Fall, 2018, 10 pages.

Information Transfer Program:

2018 Mississippi Water Resources Conference, Jackson, MS
2018 – Participant at Research Resource Fair, Mississippi State University
Listserv of 800+

Dr. Chao Xiaobo – 2017MS207B

Products:

Quarterly reports submitted


Study of Sediment and Nutrients in Pelahatchie Bay and Upland Mill-Pelahatchie Creek Watershed, Chao, X., Bingner, R.L., Zhang, Y., Yasarer, L. Final Technical Report submitted to Mississippi Water Resources Research Institute, Mississippi State University, Mississippi State, MS, 33 pgs.

Information Transfer:

Dr. Chao’s research, along with USDA-ARS NSL and MDEQ has been incorporated into materials for releasing information to the public about AnnAGNPS and CCHE models and implementation of BMPs. Research results were presented at the 2018 MWRC in Jackson, MS.
Student Support:

<table>
<thead>
<tr>
<th>Name</th>
<th>Level</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jiayu Fang</td>
<td>PhD candidate</td>
<td>Computation Hydroscience</td>
</tr>
</tbody>
</table>

Dr. Joby Czarnecki and Dr. John Ramirez-Avila – 2017MS208B

Products:

Quarterly reports submitted


Information Transfer Program:

Many oral and poster presentations were made at various conferences in the U.S. as well as Nelva, Columbia.

Student Support: this project shared students and presentations with project 2017MS209B

<table>
<thead>
<tr>
<th>Name</th>
<th>Level</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>James Grafe</td>
<td>Graduate</td>
<td>Civil and Environmental Engineering</td>
</tr>
<tr>
<td>Taylor Noble</td>
<td>Undergraduate</td>
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</tr>
<tr>
<td>James Steele</td>
<td>Undergraduate</td>
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<tr>
<td>Katelyn Polk</td>
<td>Undergraduate</td>
<td>Civil and Environmental Engineering</td>
</tr>
<tr>
<td>Andre Remedios</td>
<td>Undergraduate</td>
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</tr>
<tr>
<td>Ryan Horton</td>
<td>Undergraduate</td>
<td>Civil and Environmental Engineering</td>
</tr>
<tr>
<td>Shanika Musser</td>
<td>Undergraduate</td>
<td>Civil and Environmental Engineering</td>
</tr>
<tr>
<td>Lucas Whittenton</td>
<td>Undergraduate</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Gage Creel</td>
<td>Undergraduate</td>
<td>Agricultural and Biological Engineering</td>
</tr>
<tr>
<td>Adam Goldman</td>
<td>Undergraduate</td>
<td>Agricultural and Biological Engineering</td>
</tr>
<tr>
<td>Shelby Adair</td>
<td>Undergraduate</td>
<td>Agricultural and Biological Engineering</td>
</tr>
<tr>
<td>Dillion Drake</td>
<td>Undergraduate</td>
<td>Agricultural and Biological Engineering</td>
</tr>
<tr>
<td>William Jarrell</td>
<td>Undergraduate</td>
<td>Agricultural and Biological Engineering</td>
</tr>
<tr>
<td>Garrett Prater</td>
<td>Undergraduate</td>
<td>Agricultural and Biological Engineering</td>
</tr>
<tr>
<td>Jesse Mitchell</td>
<td>Undergraduate</td>
<td>Landscape Architecture</td>
</tr>
</tbody>
</table>
Products:

Quarterly reports submitted


Poster presentation and bottle distribution at the new Pathways to Health Fair in Ruleville, MS, April 7, 2018.


Oral presentation at ASA-CSSA-SSSA annual meeting, Presentation on October 23, 2017.

At least 2 oral/poster presentations at ASCE-WERI World Congress.


The Master thesis titled “Assessment of In-Stream Processes in Catalpa Creek Headwaters” is still in progress and expected to be published in May 2019.

In-stream processes within the Catalpa Creek. James Grafe, John J. Ramirez Avila, Tim Schauwecker, Joby Czarnecki, Sandra L. Ortega Achury, James L. Martin, Eddy J. Langendoen (peer reviewed publication to be submitted).

Two student papers summarizing different components of our project results will be submitted in January 2019 to the ASCE-EWRI Undergraduate Student Paper contest.

Benthic macroinvertebrate diversity and water quality of Catalpa Creek in Mississippi. Taylor Noble, Bradley Richardson, Shanika Musser, Sandra L. Ortega Achury, John J. Ramirez-Avila

Influence of riparian vegetation on stream health and water quality. Shanika Musser, James Grafe, Sandra L. Ortega Achury, John J. Ramirez Avila

At least two peer reviewed journal papers are in preparation.

Spatio-temporal variability of sediment concentrations and loads along the Catalpa Creek. John J. Ramirez-Avila, Sandra L. Ortega-Achury, Tim Schauwecker, Joby Czarnecki.


Identification and assessment of stream processes within the Catalpa Creek in Mississippi. Ecostream Conference, Asheville, NC. Poster presentation.


Information Transfer Program:

Many oral and poster presentations were made at various conferences in the US as well as Neiva, Columbia. Also:

- The Master thesis titled “Assessment of In-Stream Processes in Catalpa Creek Headwaters” is still in progress and expected to be published in May 2019.
- One peer reviewed journal paper is expected to be published from this effort as a product to fulfill graduation requirements.

- Six presentations involving the different studies associated to this project were submitted to different regional (i.e. 2019 MWRRI) and national (i.e. EWRI 2019) conferences in 2019.
- Two student papers summarizing different components of our project results will be submitted in January 2019 to the ASCE-EWRI Undergraduate Student Paper contest.
  - Benthic macroinvertebrate diversity and water quality of Catalpa Creek in Mississippi. Taylor Noble, Bradley Richardson, Shanika Musser, Sandra L. Ortega Achury, John J. Ramirez-Avila
  - Influence of riparian vegetation on stream health and water quality. Shanika Musser, James Grafe, Sandra L. Ortega Achury, John J. Ramirez Avila
- At least two peer reviewed journal papers are in preparation.


**Student Support:** This project shared students and presentations with project 2017MS208B.

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<td>James Grafe</td>
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<td>Civil &amp; Environmental Engineering</td>
</tr>
<tr>
<td>Ben Spiller</td>
<td>Undergraduate</td>
<td>Civil &amp; Environmental Engineering</td>
</tr>
<tr>
<td>Harley Wilkinson</td>
<td>Undergraduate</td>
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</tr>
<tr>
<td>Taylor Buie</td>
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<tr>
<td>Nathan Forbes</td>
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<tr>
<td>Jim Steele</td>
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<tr>
<td>Tulia Delgado</td>
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<tr>
<td>Diana Linder</td>
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</tr>
<tr>
<td>Germaine Cole</td>
<td>Undergraduate</td>
<td>Civil &amp; Environmental Engineering</td>
</tr>
<tr>
<td>Taylor Noble</td>
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<tr>
<td>Geneva Cattle</td>
<td>Undergraduate</td>
<td>Civil &amp; Environmental Engineering</td>
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<tr>
<td>Bradley Richardson</td>
<td>PhD candidate</td>
<td>Wildlife, Fisheries &amp; Aquaculture</td>
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<tr>
<td>Jennifer Deignan</td>
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<td>Claire Ray</td>
<td>Undergraduate</td>
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<tr>
<td>Daniel Wells</td>
<td>Undergraduate</td>
<td>Civil &amp; Environmental Engineering</td>
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<tr>
<td>Shanika Musser</td>
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<tr>
<td>Andres Ramedios</td>
<td>Undergraduate</td>
<td>Civil &amp; Environmental Engineering</td>
</tr>
</tbody>
</table>

**Dr. Kristine Willett, Mr. John Green, Ms. Stephanie Otts – 2017MS210B**

**Products:**

Quarterly reports

Community-Engaged Research: Findings from a Pilot Study and Next Steps for Expansion.”
Poster Presented at the Delta Regional Forum of the Delta Directions Consortium. Clarksdale,
MS.

Charleston Cooking Class, September 2017 (Title: Community-Based Research Strategies to
Analyze Risk of Lead Contamination in Public Water Supplies in the Mississippi Delta)

Train-the-Trainees workshop with Right! from the start maternal and child health program.

Willett, K.L., Otts, S.S., Green, J.J., Janasie, C., Woo, L., Thornton, C., Fratesi, A., Avula, B.,
Khan, I., Rhymes, J. Research Strategies to Engage Communities in the Analysis of Lead
Contamination of Water Supplies in the Mississippi Delta. Poster Presentation. Society of

J. Green, Woo, L.C., Fratesi, M., Parkman, B., Otts, S., Janasie, C., Thornton, C., Avula, B.,
Willett, K., Rhymes, J., and Snell, S. Strategies to Analyze Risk of Lead Contamination in Public
Water Supplies in the Mississippi Delta: Contributions from Community-Based Research 2017
Mississippi Public Health Association (MPHA) conference, Oct. 12-13, 2017, Jackson, MS.

Otts, S. and C. Janasie, National Sea Grant Law Center, How Safe is the Water?: An Analysis of
the Lead Contamination Risks of Public Water Supplies in the Mississippi Delta (Dec. 2017),

Willett, Green, and Showalter-Otts collaborated with Susana Cervantes from Harvard Law School
in mentoring three students during the HLS Mississippi Delta Spring Break Pro Bono Trip 2018.
Three reports summarizing their research were written resulting from this mentorship.
  o Wolfe. Identifying and responding to lead hazards in water. HLS Mississippi Delta
    Spring Break Pro Bono Trip 2018
  o Svedman. Proactively reducing exposure to lead through water. HLS Mississippi
    Delta Spring Break Pro Bono Trip 2018
  o Lee, Jude. Identifying and treating children with EBLLs. HLS Mississippi Delta
    Spring Break Pro Bono Trip 2018

S. Otts and C. Janasie, An Analysis of the Lead Contamination Risks of Public Water Supplies in the
Mississippi Delta, Mississippi Water Resources Conference, April 4, 2018, Jackson, MS.

Green, John J., Mary Alexandra Fratesi, Lynn Woo, Kristie Willett, Cammi Thornton, Bahrthi
Environmental Health through Community-Engaged Research: Testing for Lead in Drinking Water
in the Mississippi Delta." Poster Presented at the Mississippi Water Resources Conference.
Jackson, MS.

in Public Water Supplies in the Mississippi: Contributions from Community-Based Research”
University of Mississippi Medical Center Research Day 3-Minute Lecture. Jackson, MS.

Alex Fratesi. April 7, 2018. “Lead Exposure in Drinking Water: What It Means and Ways to
Manage It” New Pathways to Health Fair. Ruleville, MS.

Drinking Water and Lead Contamination in the Mississippi Delta, National Sea Grant Law Center,
http://nsglc.olemiss.edu/projects/lead-contamination/index.html (project webpage).

Tri-County Workforce Alliance’s High School Mentorship Program in the Health Care Professions

S. Otts: Delta Scholars Initiative presentation through the Delta Directions Consortium and the Mississippi State University Shackouls Honors College (July 13).


Otts and Green: Meeting with the American Heart Association’s Mississippi Delta Health Equity Committee in Mound Bayou. This included a presentation on the project along with dialogue about ways to expand the study (September 13).

Prepared “Lead exposure and drinking water” fact sheets for Bolivar, Sunflower, and Tallahatchie counties.

Proposed a joint session at the 2018 Delta Regional Forum in Clarksdale (July 18-19).

Attended the Glenn Foundation for Better Living Health, Wellness & Safety Tailgate, October 12, 2018 to pass out materials about lead in drinking water and to sign up potential participants for bottle distribution.

Attended a booth at the Greenville Delta Hot Tamale Festival, October 18-20, 2018 to pass out materials about lead in drinking water and to sign up potential participants for bottle distribution.

Expansion of summary report to include remaining at-risk counties for lead (additional 11 counties throughout the state).


Willett, K., Green, J., and Otts, S. Assessing the Effectiveness of Community-Based Research Strategies to Analyze Risk of lead contamination in Public Water Supplies in the Mississippi Delta. Final Technical Report submitted to Mississippi Water Resources Research Institute, Mississippi State University, Mississippi State, MS, 13 pgs.

Information Transfer Program:

Investigators collaborating on this research were presenting data to community members. Sharing information as well as the collection of samples was completed within the surrounding communities.

The Project Team worked with community partners to organize nine lead awareness and drinking water sampling events using eight different strategies of outreach, engagement, and recruitment. We also did two prior events supported by University of Mississippi seed funding. Because those
two events (conducted in partnership with Tri-County Workforce Alliance) were also held in the Delta, we have included those results in this report.

1. New Pathways to Health Program (Sept. 2016; Dec. 2016): Participants were recruited through presentations during program orientation and other regularly scheduled events.

2. Church Collaboration (June 2017): In partnership with the Right! From the Start Initiative participants were recruited through outreach to a church congregation in Belzoni, MS.

3. Cooking Class (Sept. 2017): Participants were recruited through a presentation at the “Cooking Matters” class offered by the James C. Kennedy Wellness Center in Tallahatchie, MS.

4. Well Owners Workshop (Oct. 2017): In partnership with MSU Extension, participants were recruited through a Mississippi Well Owners Workshop.

5. Train the Trainer (Oct. 2017): In partnership with Right! from the Start Initiative, community health care service providers working with breastfeeding mothers received training on project methods and collected water samples to learn process.

6. Student Health Fair in Ruleville (April 2018): In partnership with Tri-County Workforce Alliance New Pathways to Health Program, participants were recruited through a Student Health Council fair at Ruleville High School.

7. Community Health Center Booths (June 2018): Participants were recruited through three informational booths at Aaron E. Henry Community Health Services Center facilities in Batesville and Tunica and Delta Health Center facilities in Greenville.

8. Hot Tamale Festival (Oct. 2018): Participants were recruited through an informational booth set up at the Hot Tamale Festival in Greenville.

**Student Support:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Level</th>
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<tbody>
<tr>
<td>Alex Fratesi</td>
<td>Undergraduate</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Rachel Haggard</td>
<td>Graduate</td>
<td>Sociology</td>
</tr>
<tr>
<td>Katrina Alford</td>
<td>Graduate</td>
<td>Sociology</td>
</tr>
<tr>
<td>Heather Costa-Greger</td>
<td>Graduate</td>
<td>Sociology</td>
</tr>
<tr>
<td>William Bedwell</td>
<td>Graduate</td>
<td>Law</td>
</tr>
<tr>
<td>Morgan Stringer</td>
<td>Graduate</td>
<td>Law</td>
</tr>
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</table>

**2018MS-ADMIN**

**Products:**

www.wrri.msstate.edu
2019 Mississippi Water Resources Conference – April 2-3, 2019 – Jackson, MS
MWRRRI E-Newsletter, Spring, 2019, 9 pgs.
Information Transfer Program:

2019 Mississippi Water Resources Conference, Jackson, MS
Listserv of 800+

Dr. James Cizdziel – 2018MS211B

Products:

Quarterly report submitted

Austin Scircle, "Spatial Distribution of Microplastics in the Mississippi River Basin" poster presentation at Mississippi Academy of Science Annual Meeting, Hattiesburg, MS, February 21-22, 2019. **Austin won 2nd place.**

James Cizdziel presented a poster, "One Pot" Method for Analysis for Microplastics from Natural Waters, Soils, and Sediments at the Society for Environmental Toxicology and Chemistry (SETAC) National Meeting in November 4-8, 2018 in Sacramento, CA. Poster authors include, Austin Scircle, Lilly Li, and Zhiqiang Gao.

Cizdziel, J. and A. Scircle, Microplastics in the Mississippi River System, oral presentation made at the 2019 Mississippi Water Resources Conference, April 2-3, 2019, Jackson, MS.


James Cizdziel co-chaired a special session on Microplastic Pollution at the Society for Environmental Toxicology and Chemistry (SETAC) 2019 Europe Annual Meeting in Helsinki, Finland. June, 2019. The event was well attended and a summary paper is forthcoming.

Submitted a paper to the Journal of Chemical Education titled “Microplastics: What's the Big Deal? Detecting and Quantifying Microplastics in Natural and Bottled Water using Fluorescence Microscopy: A New Experiment for Instrumental Analysis and Environmental Chemistry Courses”. Once the paper has been accepted a pdf will be provided.

We will also continue our microplastic-mercury sorption experiments and present the research at the International Conference on Mercury as a Global Pollutant in Krakow, Poland (Sept. 7-13, 2019). Year 2 funding used.


"Microplastics in the Mississippi River System and Along the Mississippi Gulf Coast: method development and spatial and temporal trends." A. Scircle, PhD expected 12/2020.
"Interaction of Mercury and Other Heavy Metals with Microplastics." G. Geo, PhD expected 12/2021.


Cizdziel, J. Microplastics in the Mississippi River and Mississippi South. Final Technical Report submitted to Mississippi Water Resources Research Institute, Mississippi State University, Mississippi State, MS, 13 pgs.

**Information Transfer Program:**

University of Mississippi hosted two scientists from the USGS Washington Water Science Center’s Microplastics Laboratory who came to learn about the new analytical methods. Discussion included: field methods, quality assurance methods and confirmatory methods like FTIR and Raman were extremely valuable and helpful in the development of a upcoming workshop on MPs that the USGS will sponsor.

Presented information regarding microplastic pollution to a student assembly at Lafayette Middle School.

**Student Support:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Level</th>
<th>Major</th>
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<tbody>
<tr>
<td>Danielle Behrend</td>
<td>Undergraduate (thesis completed 5/2019)</td>
<td>Chemistry</td>
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<tr>
<td>Zhiqiang Gao</td>
<td>PhD Candidate (expected 12/2021)</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Holly Horton</td>
<td>Undergraduate (thesis completed 5/2019)</td>
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<tr>
<td>Libby Li</td>
<td>Undergraduate (thesis completed 5/2019)</td>
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</tr>
<tr>
<td>Klara Missling</td>
<td>Undergraduate</td>
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</tr>
<tr>
<td>Austin Scircle</td>
<td>PhD Candidate (expected 12/2020)</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

**Dr. Gary Ervin and Gray Turnage – 2018MS212B**

**Products:**


Ervin, G.N. and G. Turnage. Aquatic vegetation management to enhance multiple-user benefits of southeastern wetlands. Final technical report submitted to Mississippi Water Resources Research Institute, Mississippi State University, Mississippi State, MS, 6 pgs.

**Student Support:**

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Kennedy Calhoun</td>
<td>graduate student</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>Adrian Lazaro-Lobo</td>
<td>PhD candidate</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>Allison Ratliff</td>
<td>undergraduate</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Anirudh Aditya</td>
<td>undergraduate</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Akshita T. Singh</td>
<td>undergraduate</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>Mason Thomas</td>
<td>undergraduate</td>
<td>Wildlife, Fisheries &amp; Aquaculture</td>
</tr>
<tr>
<td>Landon Sanders</td>
<td>GRA</td>
<td>Geography</td>
</tr>
<tr>
<td>Chandler Bryant</td>
<td>11th grade at MSMS</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Information Transfer Program:**

Research data has been presented at conferences in Mississippi, New York, Tennessee, Louisiana, and Maryland.

**Dr. James Cizdziel – G19AP000-4 – 104G annual progress report**

Assessing Microplastic Pollution in the Mississippi River System and at Oyster Reefs in the Mississippi Sound Estuary
**Products:** (shared publications with 2018MS211B)


James Cizdziel and Austin Scircle, Microplastics in the Mississippi River System, oral presentation at Mississippi Water Resources Conference, April 2-3, 2019, Jackson, MS.


James Cizdziel co-chaired a session at the 2019 SETAC meeting in Helsinki titled, “Micro(Nano) plastic Pollution: Tackling the Plastic Problem by Identifying Sources, Investigating Fate and Novel Approaches.”

**Student Support:** (shared with project 2018MS211B)

<table>
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<tr>
<td>Zhiqiang Gao</td>
<td>PhD Candidate</td>
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<td>Libby Li</td>
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</tr>
<tr>
<td>Austin Scircle</td>
<td>PhD Candidate</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

**Information Transfer Program:**

Presentations have been given in Mississippi as well as Helsinki, Finland.
Senior theses were completed by Libby Li and Holly Horton.
An age appropriate presentation was given to students at Lafayette Middle School.

**Total Students:**

Other 1
Undergrad 37
Graduate 6
PhD candidates 5
WRRI Annual Reports: Project Synposis

Email address: jessie.schmidt@msstate.edu
Institute: Mississippi

Grant Type

[ ] Annual Base Grant
[X] National Competitive Grant
[ ] Coordination Grant
[ ] Student Internship

Project Title
Assessing Microplastic Pollution in the Mississippi River System and at Oyster Reefs in the Mississippi Sound Estuary

Project ID
G19AP0004

Project Impact (provide a synopsis of the primary findings and/or impact of this project. Please limit your answer to 250 words.)

Microplastics (MPs) are harming aquatic organisms and entering the human diet. The majority of seafood comes from coastal areas where MPs congregate. This project aims to systematically quantify the concentrations and loads of MPs and characterize their shapes, size distribution, and chemical composition in the Mississippi River (MR) system – a source of drinking water to over 18 million people, as well as at oyster reefs in the Mississippi Sound Estuary.

Samples have been collected during summer 2018 and spring 2019 from the main stem of the Mississippi River, its major tributaries and along the Gulf Coast. Spring samples were collected under mostly flood conditions; however, late summer is typically the lowest flow with fall and winter intermediate.

We are investigating sorption/desorption behavior of Hg species with MPs because of the heightening concern over MP pollution is their ability to serve as carriers of pollutants that are either part of the plastics (additives) or they are accumulated from the environment.
MPs are prepared by cryomilling weathered plastics found in the environment. Weathered plastics have different surface characteristics and pore structure compared to MPs generated raw virgin plastics.

Multiple samples have been collected from the Gulf Coast, many near oyster reefs and we are processing them in order to characterize microplastic abundances and types. We are completing experiments with different types of MPs at varying concentrations with both Hg$^{2+}$ and MeHg, as well as for different size-classes of particles. These results are providing insight into sorption characteristics of mercury species with environmentally relevant MPs.
WRRI Annual Reports: Project Synopsis

Email address: jessie.schmidt@msstate.edu
Institute: Mississippi

Grant Type

___X___ Annual Base Grant
_____National Competitive Grant
_____Coordination Grant
_____Student Internship

Project Title

Microplastics in the Mississippi River and Mississippi Sound

Project ID

2018MS211b

Project Impact (provide a synopsis of the primary findings and/or impact of this project. Please limit your answer to 250 words.)

This one year project, part of a larger ongoing research effort to evaluate microplastic (MP) pollution in the Mississippi River System and at oyster reefs in the Mississippi Sound, established new field and laboratory methods for quantifying and characterizing microplastic pollution and collected preliminary data from the Mississippi River and its tributaries. A ‘one-pot’ method was developed that minimizes contamination and losses during sample preparation for detection and characterization purposes.

- Morphology of the MPs was dominated by fragments and fibers,
- Particle count increased near exponentially with decreasing size,
- Tributaries and sites near pollution centers had higher MPs concentrations,
- Ohio and Missouri rivers had the highest tributary loadings, Tennessee and Yazoo rivers the lowest, reflecting both flows and MP concentrations,
- Counts and loads of MPs generally increased down the main stem of the Mississippi River until New Orleans, where loads declined,
- Samples should be collected upstream from boat ramps as boat traffic can increase water turbidity,
• Fluorescence source intensity, exposure time, and dye concentration have the greatest impact on MPs counting accuracy, and
• MP counts in lab and reagent blanks were low (<10% of sample counts) and doubling the water sampling volume roughly doubled counts.
WRRI Annual Reports: Project Synopsis

Email address: jessie.schmidt@msstate.edu
Institute: Mississippi

Grant Type

__X___Annual Base Grant
_____National Competitive Grant
_____Coordination Grant
_____Student Internship

Project Title

Study of Sediment and Nutrients in Pelahatchie Bay and Upland Mill-Pelahatchie Creek Watershed

Project ID

2017MS207b

Project Impact (provide a synopsis of the primary findings and/or impact of this project. Please limit your answer to 250 words.)

BMPs are effective ways to reduce the loads of sediment and nutrients from upland watershed. According to model predicts reducing the upland nutrients and SS loads by 50% would reduce average concentrations of SS, NH4, NO3, PO4, and Chlorophyll a in PB by approximately 50%, 40%, 50%, 6%, and 55%, respectively.

- Integrated AnnAGNPS watershed model and CCHE model provides useful tools to study the response of WQ in surface water to the loads of upland watershed, and provides a system analysis approach to evaluate the effectiveness of BMPs on the reduction of nutrients and SS loads.
- Numerical models are effective tools to predict the loads of SS and nutrients from upland watershed and simulate the long term and short term distributions of SS and nutrients in the receiving waterbodies.
- CCHE_MESH is a very effective tool to generate computational mesh for natural water body with complex geometry.
• In Mill-Pelahatchie Watershed, the urban growth increased runoff and nitrogen loads but implementing water retention ponds limited these loads by up to 1% and 25%, respectively, in high urban growth areas.
• The implementation of BMPs, such as the establishment, stabilization measures of disturbed soil on urban construction sites that included water and sediment retention ponds is very effective to reduce the loads of SS and nutrients in the upland watershed.