ICM Water Quality Code Technical Transfer Workshop

March 12 – 14th, 2019

IAN Annapolis Office, Large Conference Room.
Address: 429 4th Street, Annapolis, MD 21403 Meeting Webpage:
https://www.chesapeakebay.net/what/event/tech_transfer_workshop

Attendees to March 11-13, 2019 Workshop:

1. Jim Fitzpatrick, HDR
jim.fitzpatrick@hdrinc.com
I am a water quality modeling practitioner at HDR with 45+ years of experience in the water quality modeling field with a good bit of it in the Chesapeake Bay. I am well-versed in these issues and have the right background to fully comprehend the information and thus to benefit from the technology transfer and be in a position to assist past (VADEQ) and potential HDR clients (municipalities) in understanding how the model was used to determine the Bay nutrient TMDL.

I would like to attend the workshop to get a better and more detailed understanding of the Phase 6 model. It is important the technology transfer be available to modelers in the private sector, to ensure an effective and broad sharing of this public information and communication across sectors.

2. Qubin Qin, VIMS
qubin@vims.edu
Qubin Qin is a Ph.D. Candidate at Virginia Institute of Marine Science working with Dr. Jian Shen. He is studying impacts of physical transport on estuarine phytoplankton dynamics and harmful algal blooms, through both theoretical analysis and numerical modeling.

I want to learn the ICM code systematically, and to discuss pros and cons of the current state of the art in ICM as well as the future direction of water quality modeling with other participants.

3. Guido Yactayo, MDE
guido.yactayo@maryland.gov
I'm an environmental engineer with broad experience working in both research institutions and government agencies. At MDE, I assist senior engineers in the development of hydrologic models

for use in calculating Total Maximum Daily Loads (TMDL) for water bodies in the State of Maryland.

I'd like to attend the course because I'm interested in learning more about the estuary model. MDE and ICPRB will continue working next year in modeling related topics, tidal tributaries simulations in Maryland will be one of those. Attending the workshop would be very beneficial.

4. Xiaoting Chen, JHU
xchen123@jhu.edu
Xiaoting Chen is a master student at Johns Hopkins University, majoring in Environmental System Engineering. Her major interest is in further exploring and application of systems analysis, economic, and management methods to water resource and energy planning. She plans to pursue a Ph.D. in the near future, and would like to continue her current work on Chesapeake Bay aeration.

I am currently working with Dr. Dan Sheer, exploring the feasibility of reducing Dead Zone in Chesapeake Bay by using aeration; I helped present the results to the modeling working group in October. I would like to learn to run the model to continue this work, and to develop a comprehensive understanding of Chesapeake Bay water system, so that I can better assess the alternative strategies for eliminating hypoxia and improving environmental quality in the Chesapeake Bay.

5. Dan Sheer, HydroLogics Inc. ***(ret.)***
dsheer@hydrologics.net
Dan Sheer, Ph.D. JHU DOGEE (1975), is the former Technical Director of ICPRB and the first Director of the COOP Section, and the founder, former President and Chairman of the Board of HydroLogics Inc. He has substantial experience in Fortran programming, has invented a programming language (OCL), and developed water management decision support software for a wide range of clients, nationally and internationally. He is a pioneer in the field of collaborative modeling and has been a major contributor to the development of innovative solutions to complex water management problems, including the Washington Metropolitan Area Water Supply Agreements (COOP), and the 2006 agreements on the operation of Conowingo Dam.

I have been recently working, pro bono, with Xiaoting Chen, a student who took my course on collaborative modeling at JHU EHE, on assessing the pros and cons of using aeration to eliminate the dead zone in the Chesapeake Bay, with a report to the modeling working group in October and another scheduled for January. Much progress has been made, and many more runs of the WQST are contemplated. Xiaoting and I would like to learn to run the model so as to relieve Richard Tian of the burden of making those runs, and to allow us to better and more quickly "follow our noses" in creating innovative management strategies and doing sensitivity analyses.

6. Kyle Hinson, VIMS
kehinson@vims.edu
Kyle Hinson is currently a Master's Student at the Virginia Institute of Marine Science working with his advisor Dr. Marjy Friedrichs. Prior to starting at VIMS, he worked with the Modeling Team at the Chesapeake Bay Program on inputs and climate simulations for the Phase 6 Watershed Model.

Kyle is interested in learning more about ICM to better his understanding of models used for biogeochemical simulations within the Chesapeake Bay to include those beyond ChesROMS.

7. Carlington Wallace, ICPRB
cwallace@icprb.org
Carlington Wallace is an Environmental Scientist with the Interstate Commission on the Potomac River Basin (ICPRB), Rockville, MD. Dr. Wallace conducts environmental data analysis and investigates the impact of environmental conservation practices on surface water quality with a view to providing solutions for environmental issues. Recently, Dr. Wallace's work has been focused on assessing the prospect for developing sediment TMDLs by applying the MDE sediment TMDL methodology (developed based on Phase 5 CBWM) using Phase 6 Watershed Model results.

I will be conducting water quality modeling for select Maryland estuaries beginning in 2019 and I believe this workshop would be beneficial to me especially since I have not used CE-QUAL in over six years. Results from these studies will help to inform the next phase of the Chesapeake Bay Model.

8. Chunqi Shen, UMES
cshen@umces.edu
I am Chunqi Shen, a postdoc in CBL-UMCES, working with Jeremy Testa. I am currently doing water quality modelling work in the Chesapeake Bay. Specifically, I use the ROMS-RCA associated with the newly developed carbonate chemistry module to investigate the estuary acidification under different scenarios including diverse nutrient inputs, freshwater discharge, and ocean-atmosphere boundaries.

I believe this workshop would be beneficial for me to strength my understanding of Bay-wide water quality and biogeochemistry through learning the ICM code as well as with communication with other Chesapeake modelers.

9. Nicole Xun Cai, VIMS
ncai@vims.edu
Nicole Cai is a continuing doctoral student at the Virginia Institute of Marine Science after completing her Master's degree earlier in 2018. Her research interest is modeling on water quality and interaction of seagrass with the aquatic system.

Nicole is working on the application of ICM on Chesapeake Bay under the SCHISM frame work, which is highly relevant to this workshop.

10. Fei Ye, VIMS (Joseph student)
feiye@vims.edu
Dr. Fei Ye is a Post-doc research associate at CCRM, VIMS. Having recently graduated from VIMS, he did one chapter of his Ph.D. thesis on the SCHISM Chesapeake Bay hydrodynamic model. At the moment, he is working closely with other SCHISM developers who are in charge of the SCHISM water quality model for the Bay.

Fei is interested in developing skills and knowledge of setting up CE-QUAL-ICM model for the Bay, so as to facilitate inter-model comparison between CE-QUAL-ICM and SCHISM-ICM.

11. Sen Bai, Tetra Tech
sen.bai@tetratech.com
My name is Sen Bai and I'm currently a modeler at Tetra Tech's Fairfax office. I received my PhD degree in water quality modeling working with Prof. Winston Lung from the University of Virginia in early 2004. I then joined Tetra Tech as a modeler and has been with Tetra Tech for almost 15 years working on modeling projects for a variety of surface waters. Most of the projects are for supporting TMDL development.

I routinely use the EFDC model which uses the ICM model algorithm for the water quality module for my projects. I'm really curious on the updates of the ICM model and see if these updates can be applied in other surface waters.

12. Haoran Liu, UMES
hliu@umes.edu
I am Haoran Liu, a graduate student in Marine Estuarine Environmental Sciences (MEES) Program. I am trying to use a water quality model to investigate the biochemical processes in shallow coastal bays. I have been running the ICM code for half year, but still have some unanswered questions.

I really wish to attend this interesting workshop to learn more of model techniques and communicate with other researchers on water quality issues of Chesapeake Bay and Maryland Coastal Bays.

ICM Water Quality Code Technical Transfer Workshop

July 23 - 25, 2019

National Conservation Training Center
698 Conservation Way, Shepherdstown, WV 25443
Webpage: https://www.chesapeakebay.net/what/event/tech_transfer_workshop

Attendees for July Workshop:

1. Carl Friedrichs, VIMS
Carl.Friedrichs@vims.edu

2, Marjy Friedrichs, VIMS
marjy@vims.edu

3. Joseph Zhang, VIMS
yjzhang@vims.edu

4. Jeremy Testa, UMCES
jtesta@umces.edu
I am an Assistant Professor at the Chesapeake Biological Laboratory and my research program focuses on coastal marine ecology, including eutrophication, nutrient cycling, and dissolved oxygen dynamics. My group uses a combination of experimental efforts, historical data analysis, and coupled biogeochemical-hydrodynamic modeling studies to examine many aspects of estuarine and coastal aquatic science.

Given my experiences modeling Chesapeake Bay biogeochemistry, including the use of a stand-alone version of the sediment model that resides in ICM, I would benefit by learning more about how to implement CE-QUAL-ICM. I am especially interested to learn more about the various living resource modules and how they interact with biogeochemistry.

5. Jilian Xiong, VIMS
jxiong@vims.edu
I'm a first-year Ph.D. student at VIMS working with Dr. Shen. My study will focus on ecological modeling of estuaries.

This workshop will provide me helpful backgrounds and hands-on experiences on water quality modeling, which can promote my research work.

6. Elizabeth W. Boyer, PSU
bethboyer.psu@gmail.com
Hi Lewis, thanks for this. I would like to attend the June 2019 workshop; please keep me posted. Regards, Beth

7. Lisa Ziegler, UMCES
lziegler@umces.edu

My name is Lisa Ziegler, I graduated with a BSc. in Biodiversity and Conservation Biology (2016) from UWC, South Africa, and a MSc. in Biological Oceanography (2018) from NMMU, South Africa. I am currently a first year PhD student supervised by Prof. Raleigh Hood at HPL, UMCES. My research is part of a larger project funded by NASA, where the overall aim is to implement an integrated FVCOM-ICM model to investigate the anthropogenic effects on coastal wetland-estuaries and it's influence on water quality by running hindcast and forecast scenarios.

I will be using the ICM model extensively in my Ph.D. thesis research, and plan to start working on implementing the model in 2019. Thus attending the workshop in June would be timely and highly beneficial.

8. Cassie Gurbisz, St. Mary's College
cbgurbisz@smcm.edu
I'm an assistant professor of environmental studies at St. Mary's College of Maryland. My research focuses on estuarine ecosystem ecology, particularly in SAV and marsh systems.

I'm interested in the workshop because I'd like to at least understand how my research can better facilitate CBP model development and, ideally, how to use the models to directly address research questions. My undergraduate Chesapeake Science and Management course also includes a modeling component and I hope to use what I learn in the workshop to improve this series of class activities.

9. Raleigh Hood, UMCES
rhood@umces.edu
I am a professor and biological oceanographer at the University of Maryland Center for Environmental Science, Horn Point Laboratory. I have more than 20 years of experience doing biogeochemical and hydrodynamic modeling over a wide range of scales from small tributaries of Chesapeake Bay to ocean basin wide.

I am a co-organizer of this workshop. I am interested in participating to learn more about ICM and also to provide my own expertise and insights to students in the course.

10. Bill Ball, CRC
ballw@chesapeake.org
I am *Executive Director of the Chesapeake Research Consortium (CRC) and hold this position through the Johns Hopkins University, where I continue to teach and conduct research as a Research Professor in the Department of Health and Environmental Engineering. Over the last 30 years, I have been investigating and modeling various aspects of water quality and the processes that affect them, with applications to both natural aquatic systems and engineered processes. I am currently a co- PI and Project Director for a multi-university project under NSF's Water, Sustainability and Climate program that focuses on linking changing agricultural practices with water quality impacts to Chesapeake Bay. Through my CRC position, I work to foster collaborative research and facilitate the application of science toward better understanding and management of the Chesapeake Bay and its watershed. This includes working closely with STAC as its Executive Secretary and working closely with multiple CBP partners through workshops, reviews and other activities supported by cooperative agreements with NOAA's Chesapeake Bay Office and the U.S. EPA's Chesapeake Bay Program Office. The*

CRC and the NCBO also support the Chesapeake Community Modeling Program (CCMP) and I serve on the Steering Committee of that group.

I would like to have a fuller understanding of the WQSTM model and to be able to run it when appropriate, in order to better share it with others and to better facilitate discussions of its relative strengths and weaknesses in settings where model comparisons, research needs, and plans for future R&D are being discussed. I am also interested in better understanding its implications and nuances in the context of better communicating with co-PIs who have primary responsibility for the estuarine modeling in our NSF-funded work. (These are Jeremy Testa [UMCES] and Damian Brady [U. Maine].)

11. Julia Moriarty, USGS
jmoriarty@usgs.gov
I am a Research Oceanographer and Mendenhall Post-doctoral Fellow at the U.S. Geological Survey's Woods Hole Coastal and Marine Research Center. For my research, I use both water column biogeochemistry and sediment diagenesis models to analyze variations in water quality (oxygen and nitrogen dynamics) in the Chesapeake Bay, as well as other systems including the Louisiana Shelf; New Jersey's Barnegat Bay; and France's Rhone delta. In particular, my background focuses on developing and implementing coupled hydrodynamic-biogeochemistry-sediment transport-vegetation models. I primarily use the Regional Ocean Modeling System (ROMS) and related models, but am interested in using CE-QUAL-ICM as well.

Knowledge of, and ability to use, CE-QUAL-ICM will facilitate my ability to pursue research questions that are pertinent to management efforts in the Chesapeake Bay and other systems. In particular, in 2019-2020, I will be working on a USGS-funded project to model changes in estuarine habitat in Chesapeake Bay; attendance at this workshop will help me to collaborate with other Chesapeake Bay modelers and managers.

12. Kate Liberti, U. Maine
kate.liberti@maine.edu
I am interested in joining the water quality code transfer workshop in January. I am a PhD student in oceanography at the University of Maine working with Dr. Damian Brady. My dissertation work is looking at the acidification and primary production changes occurring in the largest oyster producing estuary in the Gulf of Maine.

I am interested in this workshop because modeling would be a great tool for my work estimating a carbonate carrying capacity.