



# Ohio Section

## American Institute of Professional Geologists

Chartered 1965

February 2021 Newsletter

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## **AIPG Ohio Section 2021 Virtual Winter Meeting**

### **Pre-Stack Inversion and AVO Attributes as Hydrocarbon Indicators in Carbonate Rocks: A Case Study from the Illinois Basin**

**Presenter: Mr. Jacob T. Murchek, MS Candidate,  
Wright State University**

### **The Valvata Genus of North American Freshwater Snail as a Supplemental Climate Proxy for Crystal Lake, Ohio**

**Presenter: Ms. Jackie Manker, MS Candidate,  
Wright State University**

**Date:** Tuesday, February 16, 2021

**Time:** 7:00 pm

**Via Zoom:** Link to be sent following registration.

**Event Registration** (The event is FREE, but registration is required): <https://www.aipg-ohio.org/eventdetails.php>

*See Page 6 for event details*

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## Message from the President

**Tom Jenkins, CPG-078922**

Hello fellow AIPG members and welcome to 2021! What a wild time it has been. In-person activities for much of last year were cancelled due to Covid-19 and 2021 is not looking a whole lot better.

For those of you that do not know me, I am retired, having worked as a geologist for 42 years, most of that as a consultant in central Ohio, and most of my consulting career with Eagon & Associates, Inc. I have a BS from Kent State and a MS from Ohio University, registration in Pennsylvania and West Virginia. I was first acquainted with AIPG in 1988, while working with Curt Coe at Malcolm Pirnie Inc. I became a member in 1991 and have been active with the Ohio Section for most of my professional career. I was instrumental in implementing programs for AIPG member continuing education, first with the two Ohio shale conferences and then later with the Vapor Intrusion seminars. We started planning for a PFAS seminar last year, but it was cancelled due to COVID concerns.

First of all, thanks to the entire Executive Committee for their service in 2020. I'd like to welcome the 2021 Executive Committee members; switch hitting Past President and President elect Robert Andrews, Treasurer Dave Follett, Secretary Alex Conley and Members-at-Large Nelson Novak, Michael Friedhoff and Tim Brown. Nelson Novak has also taken on the responsibility of Newsletter Editor. Thanks to Shay Beanland for three years of service as Newsletter Editor.

Robert made the best of it for 2020 with a successful winter meeting and golf outing and a first ever Zoom Annual Meeting. We are hopeful that we can get things back to normal in the second half of 2021. However, we will start 2021 off with a virtual Winter Meeting featuring presentations from two Wright State University graduate students. More details can be found on page 6 of this newsletter. We also plan get back to things as normal with a golf outing this summer, our September meeting in northeastern Ohio and an Annual Meeting in November. We are evaluating holding a PFAS seminar in early November, but that is still in the planning stage. We are not planning any field trips for 2021 because the logistics are uncertain with Covid-19. Page 5 of this newsletter shows the tentative schedule for 2020.

As I look back, I'm amazed at the difference 30 years of involvement in AIPG made on my career. The professional contacts, job opportunities, resource connections, and professional development aspects all run through it all. I could have had a career without it, but it would have been much less fulfilling, and much less successful too. My first piece of advice to a young professional in any career is to get involved with your peers in a professional group. You will travel a journey together with them and you never know when a contact from a professional group will be the key to enhance or advance your career. I hope that an increased interest in professional organizations is a byproduct of remote working under Covid-19. We are all due something positive from this.

Like so many things with Covid-19, I miss what I once took for granted. To go to an AIPG Ohio Section dinner, see some old friends and new ones too, chat with students, hear a good talk, that would be a good evening. I hope that once this cloud has lifted, we all seek to expand our professional affiliations more, and take advantage of the great networking opportunities that AIPG Ohio Section provides.

Feel free to contact me at [tjenkins@eagoninc.com](mailto:tjenkins@eagoninc.com) if you have questions.  
Tom Jenkins, CPG 7892  
2021 AIPG Ohio Section President



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Calendar of Upcoming Events	
February 16, 2021	AIPG Ohio Section Winter Virtual Meeting in conjunction Wright State University Wright State University Students Mr. Jacob Murchek, MS Candidate and Ms. Jackie Manker, MS Candidate <a href="https://www.aipg-ohio.org/eventdetails.php">https://www.aipg-ohio.org/eventdetails.php</a>
April 15, 2021	AIPG Ohio Section Spring Virtual Meeting Speaker: Sam Hulett, Geologist, Ohio Division of Geological Survey.
June 2021	3 <sup>rd</sup> Annual AIPG Ohio Section Charity Golf Scramble (exact date and location TBD)
September 16th, 2021	AIPG Ohio Section 2021 Fall Meeting and Dinner Presentation –Streetsboro, Ohio Speaker: To be determined
October 23-26, 2021	AIPG National Meeting, Sacramento, CA
November 18, 2021	AIPG Ohio Section 2021 Annual Meeting – Speaker: To be determined.

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# Ohio Section 2021 Virtual Winter Meeting Presentation

*Feature Presentations:* Pre-Stack Inversion and AVO Attributes as Hydrocarbon Indicators in Carbonate Rocks: A Case Study from the Illinois Basin

By Mr. Jacob Murchek, MS Candidate, Wright State University

The Valvata Genus of North American Freshwater Snail as a Supplemental Climate Proxy for Crystal Lake, Ohio

By Ms. Jackie Manker, MS Candidate, Wright State University

The Ohio Section of AIPG is pleased to host Mr. Jacob Murchek and Ms. Jackie Manker at the Section's Virtual Winter Meeting presentation, which will take place on Tuesday, February 16, 2021 via Zoom. Mr. Murchek will be presenting: Pre-Stack Inversion and AVO Attributes as Hydrocarbon Indicators in Carbonate Rocks: A Case Study from the Illinois Basin and Ms. Manker will be presenting: The Valvata Genus of North American Freshwater Snail as a Supplemental Climate Proxy for Crystal Lake, Ohio. This event is sponsored by Alpha Analytical, Environmental Remediation Contractors, Ohio Soil Recycling, and White Oak Environmental.

The event begins at 7:00 pm. The event is FREE, but registration is required. Register through the AIPG Ohio Section website <https://www.aipg-ohio.org/eventdetails.php>.

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*Pre-Stack Inversion and AVO Attributes as Hydrocarbon Indicators in Carbonate Rocks: A Case Study from the Illinois Basin*  
by Mr. Jacob T. Murchek

## **ABSTRACT**

Two-D pre-stack seismic data were conditioned and interpreted to identify amplitude variation with offset (AVO) attributes corresponding to the presence of hydrocarbons within the North Vernon Limestone interval in the Illinois Basin. The seismic data were acquired over the Glen Ayr oil field east of Terre Haute, Indiana, prior to wells being drilled. Production in the Glen Ayr

field is from porous dolomites draped by tight limestone or dolomites over a Silurian reef complex. Hydrocarbon bearing zones were successfully identified along the NVL interval using AVO attributes and pre-stack seismic inversion of line CM-27-14.

Amplitude anomalies in pre-stack seismic data are used as a risk analysis tool when identifying hydrocarbons in the subsurface. AVO analysis is most often applied to poorly consolidated Tertiary rocks due to the compressibility of these strata when natural gas and porosity are present. In contrast, well-lithified carbonate rocks are less prone to producing a pre-stack amplitude response due to the rigidity of their frame. We show that with appropriate pre-stack data conditioning, that subtle AVO responses in Illinois Basin carbonates may indicate the presence of hydrocarbons. The results show that strong, negative AVO gradients along the NVL interval correspond to oil-producing zones, whereas zones with positive or no gradient correspond to non-producing zones.

A Pre-stack inversion was done to convert reflection data into quantitative data representing the rock properties. The inversion shows high impedance zones confirming the presence of nonproductive, tight dolomite atop the reef structure. Low-impedance, low  $V_P/V_S$  ratio zones that correlate directly to strong negative gradients on the AVO volumes are known to be hydrocarbon reservoirs from well control, confirming the class I AVO anomaly observed on the gathers.

*\*This work has been submitted to AAPG Bulletin and is currently under review*

**Bio:** Jacob T. Murchek received his B.S. (2018) in chemistry from Purdue University and is currently in the process of obtaining his M.S in earth and environmental sciences (geophysics concentration) from Wright State University. His current research focuses on using pre-stack seismic interpretation methods to identify hydrocarbons in carbonate rocks. He also has experience in the mining industry as an exploration geophysicist using magnetics, electromagnetics, geochemical, and geologic data to identify gold prospects. Upon graduation, he intends to acquire a Ph.D. specializing in hydrocarbon and mineral exploration.

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*The Valvata Genus of North American Freshwater Snail as a Supplemental  
Climate Proxy for Crystal Lake, Ohio  
by Ms. Jackie Manker*

**ABSTRACT**

**Abstract:** This presentation will highlight various paleo ecological proxies found within a sediment core, which will enable the reconstruction of past aquatic ecosystems in Crystal Lake, Medway, Ohio. Crystal Lake is a natural kettle lake formed at the end of the Wisconsin

glaciation. It is now surrounded by approximately 500 residential homes and is privately owned by the HOA of Crystal Lake. The purpose of this ongoing study is to aid in modeling how the lake may respond to future climate change based on its response to previous climatic changes. A sediment core was extracted from Crystal Lake in 2007 and has been carbon dated to 18000 years before present, indicating that it contains a complete sedimentary history from late Pleistocene until today. Loss on ignition and pollen data completed by previous colleagues will help build a context for current research in the contribution of North American freshwater snails as paleo ecologic proxies of past aquatic habitats. While pollen and LOI data have shown a progression of vegetation through several stages from post glacial initial colonization to modern vegetative landscape, snail communities have remained relatively stable. Although research is still ongoing, Crystal Lake appears to have remained a stable yet complex aquatic ecosystem despite climatic shifts and changes occurring outside of the lake indicating that natural lakes in south western Ohio may be less sensitive to climate change than expected.

**Bio:** Jaclyn Manker is a second year, Master of Science candidate with the Earth and Environmental Sciences Department at Wright State University. Her research, under Dr. Rebecca Teed, is in paleo ecology and climatology. Her thesis work is in the development of North American freshwater snails as climate proxies which may be used in conjunction with pollen data obtained from sediment cores, she also received her B.S. in Environmental Science from Wright State University in 2018, graduating with Latin and departmental honors. Her involvement in Wright State student organizations include serving as Treasurer for Sigma Gamma Epsilon, Earth Science Honor Society and SEES: Students for Earth & Environmental Sustainability. Upon receiving her MS in May 2021, Jaclyn is planning to pursue a career in environmental consulting.





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### Letters to the Editor and Editorial Submittal Guidelines

The Ohio Section welcomes and encourages membership discourse via the Section newsletter on relevant geopolitical and geological topics, in accordance with our chartered purpose. Contributing authors are requested to abide by the following guidelines to ensure civility and professionalism.

1. Scientific interpretations should include accurate and effective references.
2. Opinion pieces should be presented with reasoning. Fellow members may choose to comment or challenge a submittal with their own contribution.
3. Authors must abide by the AIPG Code of Ethics. Any author who violates this code will not be published. Authors must be respectful to fellow members, all political parties, officials and candidates.
4. Letters to the Editor should be under one page in 12 pt. Arial font.
5. Member authors should provide their name and certification number.
6. The Ohio Section also welcomes and will consider relevant articles from non-members, provided contributions abide by the above stated guidelines.

Contributions to the Ohio Section newsletter do not necessarily reflect the opinion of the Ohio Section or the editor. We reserve the right to edit for clarity and space considerations.

Please send submittals to the editor at [nnovak@eagoninc.com](mailto:nnovak@eagoninc.com).



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