

ALASKA GEOLOGY

Newsletter of the
Alaska Geological Society



Mixed Deepwater Systems from the North Slope to Offshore

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Since the Pikka-Horseshoe and Willow discoveries, oil and gas explorers have been encouraged to think: “What are the sedimentary processes controlling the abundance of anomalously thick sandstone reservoirs on the North Slope – from shelf to deepwater basin plain?” While these discoveries contain somewhat unusual deposits that explorers were unable to comfortably fit into the preexisting 21st century marine sedimentology paradigm, these discoveries highlight that marine sedimentary successions are more complex than originally interpreted and can be placed along a spectrum of sedimentary processes derived from fluid turbulence to matrix strength, and from along slope to downslope (Fig. 1, Verma et al., 2022).

Prior to the last 5-10 years, the search for deepwater conventional turbidite reservoirs promoted a singular focus on sediment transport and depositional models dominated by downslope processes. Turbidites, debrites and transitional flow deposits were interpreted to be responsible for diverse submarine fan depositional systems comprised of elegantly interconnected canyon, channel, levee, splay and overbank environments. Today, along-slope as well as downslope (i.e., turbidity current) processes are interpreted to sculpt the modern deepwater seafloor (Fig. 2, Rotzien et al., 2022; Hernández-Molina et al., 2022). Ancient stratigraphic successions in revered outcrops such as the Annot Sandstone (Grès d’Annot) in France also reveal evidence of along-slope sediment transport and deposition. In response, wildcatters and academic researchers alike have refreshed interpretations and depositional models to communicate new observations on mixed deepwater sedimentary systems to scientific and industry communities as oil price remains high in the near term. (continued on page 2)

AGS Meeting

Date & Time:	Thursday, September 29; Doors open 11:30 am, announcements 11:45 am, talk 12:00 – 1:00 pm
Program:	Mixed deepwater systems from the North Slope to offshore
Speaker:	Jonathan R. Rotzien, Basin Dynamics, Houston, TX
Place:	Hybrid online & Live Presentation at BP Energy Center ; 1014 Energy Court, Anchorage, AK
Reservations:	Reservations are not required
Login:	For instructions on how to log in see AGS website: http://www.alaskageology.org/events.html
How to Join:	Join with Google Meet: meet.google.com/nrh-aqqu-wjc or join by phone: (US) +1 520-800-2334 PIN: 991037058#

This presentation focuses on deepwater sedimentary processes and deposits, their predictive attributes and their 3D heterogeneity. While much of the global knowledge on deepwater has been generated through decades of oil and gas drilling (Fremin et al., 2022), a firm understanding of deepwater sedimentary processes is essential for many scientific and business endeavors that take place in the water column, at the seabed, and into the subsurface, as well as onshore projects that involve deepwater sedimentary intervals (Sears et al., 2022). Professionals and students in the fields of oil and gas exploration and production, carbon capture, use and sequestration, geothermal, wind, solar, aquaculture, mining, military, insurance and government are invited to participate in this discussion on the past, present and future of deepwater.

References:

Fremin, L., R. A. Sears, and C. Williams, 2022, Chapter 19: Technical (engineering) advancements enabling deepwater exploration and production, in Rotzien, J. R., C. A. Yeilding, R. A. Sears, F. J. Hernández-Molina, and O. Catuneanu, eds., *Deepwater Sedimentary Systems: Science, Discovery and Applications*, 1st ed.: Elsevier, Amsterdam, The Netherlands, 806 pp.

Hernández-Molina, F. J., S. de Castro, W. de Weger, D. Duarte, M. Fonnesu, T. Glazkova, A. Kirby, E. Llave, Z. L. Ng, O. M. Muñoz, S. Rodrigues, F. J. Rodríguez-Tovar, A. Thieblemont, A. R. Viana, and S. Yin, 2022, Chapter 9: Contourites and mixed depositional systems: A paradigm for deepwater sedimentary environments, in Rotzien, J. R., C. A. Yeilding, R. A. Sears, F. J. Hernández-Molina, and O. Catuneanu, eds., *Deepwater Sedimentary Systems: Science, Discovery and Applications*, 1st ed.: Elsevier, Amsterdam, The Netherlands, 806 pp.

Rotzien, J. R., F. J. Hernández-Molina, M. Fonnesu, and A. Thieblemont, 2022, Chapter 6: Deepwater Sedimentary Processes, in Rotzien, J. R., C. A. Yeilding, R. A. Sears, F. J. Hernández-Molina, and O. Catuneanu, eds., *Deepwater Sedimentary Systems: Science, Discovery and Applications*, 1st ed.: Elsevier, Amsterdam, The Netherlands, 806 pp.

Sears, R. A., M. Leonard, T. Chisholm, B. Langin, and C. A. Yeilding, 2022, *The Business of Deepwater: Past, Present, and Future: Strategic Panel for the International Meeting of Applied Geoscience and Energy (IMAGE '22)*, Houston, Texas, 30 Aug.

Verma, S., S. Bhattacharya, T. Fett, P. Avseth, and I. Lehocki, 2022, Chapter 16: Imaging and Interpretation: Seismic, rock physics and image log analysis workflows for deepwater systems, in Rotzien, J. R., C. A. Yeilding, R. A. Sears, F. J. Hernández-Molina, and O. Catuneanu, eds., *Deepwater Sedimentary Systems: Science, Discovery and Applications*, 1st ed.: Elsevier, Amsterdam, The Netherlands, 806 pp.

About the Speaker:



Jon Rotzien is President of Basin Dynamics and Adjunct Professor at University of Houston. He specializes in reservoir presence and quality forecasting in conventional and unconventional drilling programs. Prior to his present posts, he served BP and other supermajor and independent operators in a variety of basins and petroleum reservoir technical training programs. As a business owner and scientist, Rotzien has participated in oil and gas exploratory to development drilling, mapping expeditions, technical competency training and consulting and has served as lead geologist in about one-third of those ventures. He is currently serving as Chair of the Houston Explorers Club. Rotzien received a Ph.D. in Geological Sciences from Stanford University and a B.A. degree in Geology from Colorado College.

From the President's Desk:

Happy Fall AGS Friends!

Welcome back to another year with AGS! The board and I are looking forward to hosting a season of monthly geological presentations IN PERSON, in addition to offering scholarships to students conducting research in Alaska, and sharing earth science opportunities- both educational and professional. The BP Energy Center is open to the public again for gatherings, and we are so excited to see you all in person after a few years of virtual meeting!

For those that don't know me, I'd like to introduce myself as the new president of AGS for 2022-2023. I have had a passion for geology from a young age. I grew up running, skiing, biking, and picking up rocks in the Elk Mountains of Colorado. The transition to life in Alaska was almost seamless! I have been in Alaska for five years now working in oil and gas and continue to enjoy every minute of both my professional and recreational life here.

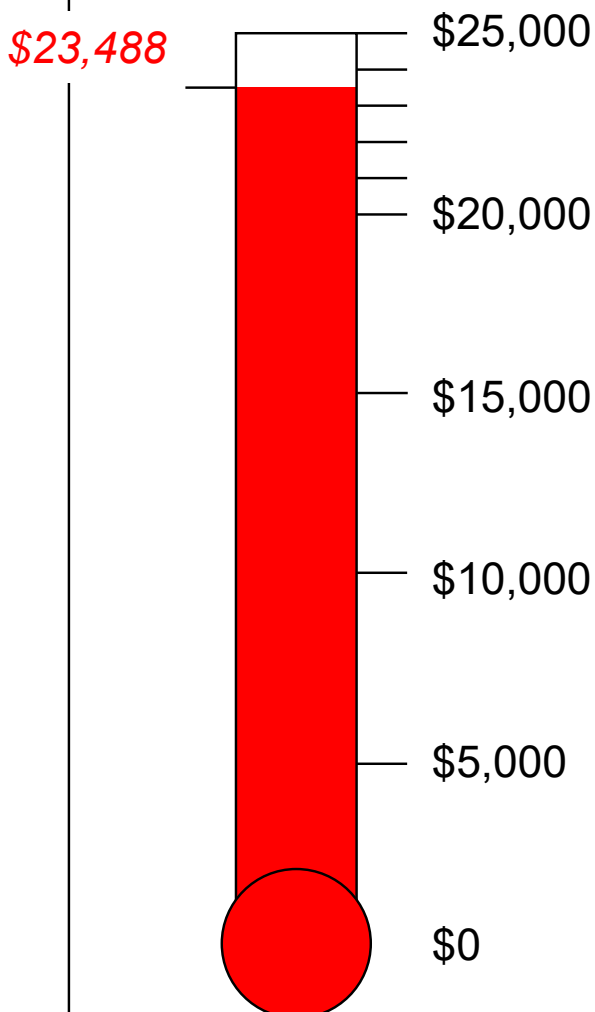
I look forward to meeting and interacting with much more of the geology community here through AGS, and am honored to be representing the passions and enthusiasts in this group.

Sincerely yours,
Sarah Frey

Gil Mull Scholarship

PLEASE HELP!

We're nearly there!



In memory of Gil Mull (1935-2021), family and friends are raising funds for the *Charles Gilbert Mull Field Camp Scholarship* for geology students at the University of Alaska Fairbanks. The scholarship will allow students to attend a geology field course of their choice.

GOAL: Build a minimum endowment of \$25,000, which will provide a UAF scholarship in perpetuity

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Please contact Prof. Michael Whalen with any questions (mtwhalen@alaska.edu)



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This is a challenging year for students at all levels, and geoscience students in the universities need our support more than ever. When you pay your membership dues this year, please consider a contribution to an AGS scholarship fund. You can also contribute to AGS scholarships through Pick, Click, Give when you apply for your Alaska Permanent Fund Dividend. **AGS is a 501c3 nonprofit organization and all contributions are tax deductible.**

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The Alaska Geological Society is an organization which seeks to promote interest in and understanding of Geology and the related Earth Sciences, and to provide a common organization for those individuals interested in geology and the related earth sciences.

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MEMBERSHIP INFORMATION

AGS annual memberships expire November 1. The annual membership fee is \$25/year (\$5 for students). Lifetime membership is \$250. You may download a membership application from the AGS website and return it at a luncheon meeting, or mail it to the address above.

Contact membership coordinator Kirk Sherwood with changes or updates (e-mail: membership@alaskageology.org; phone: 907-240-2546)

All AGS publications are now available for on-line purchase on our website.

Complete catalogue at: <http://www.alaskageology.org/publications1.html>

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Advertisements may be purchased at the following rate: \$200 for 9 monthly issues (September - May) of AGS newsletter (any size up to full page) and companion ad on AGS website for full year (beginning each September).

Contact Jennifer Crews at jennifer.r.crews@conocophillips.com to place ad.

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Did you know that you can support the society through Pick.Click.Give? When you fill out your PFD application, just select Alaska Geological Society, Inc. in the list of non-profits and you can help AGS to promote the uniqueness of Alaskan Geology and provide for education, geologic research, and networking to all who are interested as well as provide scholarships to students across a wide range of geologic topics.

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Alaska Geological Calendar of Events



Date	Time	Organization	Event	Location
May 25, 2022	11:45 am	AGS	Guy M. Oliver, Geolog Americas, "A digital-cuttings drill-down, with examples from the Geolog Americas Nanushuk-Torok Regional Cuttings Consortium"	Google Meet
Sept 29, 2022	11:45 am	AGS	Jon R. Rotzien, Basin Dynamics, "Mixed deepwater systems from the North Slope to offshore"	Hybrid: Google Meet & BP Energy Center
Oct. 27 2022	11:45 am	AGS	Chris Smith, Advanced Hydrocarbon Stratigraphy, "Evaluating Oil Quality and Microbial Activity Across Fault Blocks and Subunits of the Ugnu (N. Slope, Alaska) by Volatiles Analysis of Cuttings and Produced Crude - Implications for Completions and Production "	Hybrid: Google Meet & BP Energy Center

AMA: Alaska Miners Association; **AGS:** Alaska Geological Society; **GSA:** Geophysical Society of Alaska

AAEP: Alaska Association of Environmental Professionals; **SPE** Society of Petroleum Engineers;

UAA University of Alaska Anchorage.

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Student member - \$5

Lifetime membership - \$250



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