Deconvolving Alaska’s Barrow Arch

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For over 60 years, the term “Barrow Arch” has been used to describe an east-plunging regional structural high beneath northern Alaska and the Beaufort and Chukchi Seas that is of chief importance to the petroleum systems there. However, there are multiple interpretations of what, precisely, constitutes the Barrow Arch. For example, most, but not all, interpretations invoke the arch as a basement feature. Other interpretations refer to a Barrow Arch that existed at widely variant times from the early Paleozoic to the present and whereas many workers refer to the feature as “composite” or “complex”, the arch is normally drawn on maps as a single lineation. Numerous meanings of the term Barrow Arch have been conflated in the literature resulting in some contradictory usages; this report is an attempt to clarify the nomenclature.

Six primary usages of the term Barrow Arch are identified in this talk. These are the: 1) basement high, 2) ancestral highlands, 3) rift margin, 4) LCu antiform, 5) Brookian sill, and 6) dip-reversal usages. These usages are deconstructed herein, and other names of more exacting definitions are introduced.

These newly-defined terms are the: “Basement Arch”, “Ellesmerian Highlands”, “Rift Shoulders”, “North Alaska Anticlinorium”, and “Colville Rim”. “Basement Subcrop Areas” are introduced as regions where basement rocks were peneplaned beneath unconformities; these help to isolate the various north Alaskan rift shoulders. It is recommended that the term Barrow Arch be discarded. The North Alaska Anticlinorium is the most significant newly-defined feature for North Alaska’s petroleum systems.

AGS Luncheon

Date & Time: Tuesday, October 22; doors open at 11:30 am, talk from 12:00 – 1:00 pm
Program: Deconvolving Alaska’s Barrow Arch
Speaker: Thomas X. Homza, Shell Exploration and Production Company, Anchorage, AK
Place: BP Energy Center, 1014 Energy Court, Anchorage, AK
Reservations: Reservations are not required
Cost: Seminar is free (catered lunches are no longer available)
Feel free to bring your own brown-bag lunch
For more information call (907) 854-2363 or visit the AGS website: http://www.alaskageology.org
**About the Speaker:**

Tom Homza received a Bachelor of Science degree from the University of Vermont in 1989. He received his Master of Science and Doctoral degrees in structural geology from the University of Alaska - Fairbanks, in 1992 and 1995, respectively. He worked in various capacities for BP in Anchorage and London between 1995 and 2002. Tom moved to EnCana Oil & Gas Company in Anchorage in 2002 where he served as lead exploration geologist. His efforts at EnCana were focused mainly in Alaska’s Beaufort Sea and Brooks Range foothills. Tom started at Shell in 2005 and his roles there have included exploration geoscience work throughout the North Slope, NPR-A, ANWR, Canadian Beaufort Sea, U.S. Beaufort Sea, Chukchi Sea, North Aleutian Basin and Cook Inlet Basin. His current title is Principal Regional Geologist – Alaska. Tom has been a member of AAPG for over 22 years and is active in mentoring students as part of the Imperial Barrel Award competition. He has served on the Geologic Mapping Advisory Board for the State of Alaska for 13 years. He is past President and Vice President of the Alaska Geological Society.

**From the President’s Desk:**

Dear Alaska Geological Society Members,

The Alaska Geological Society (AGS) is a strong supporter of the geoscience academic and research programs for the Alaska Universities system. The University of Fairbanks and the University of Alaska are our strongest focus. We support in a multitude of ways. A strong scholarship program, interaction with students, and technical conferences.

We also offer a strong letter and public testimony when focused support is needed.

Over 80% of our yearly membership fees go to supporting student scholarships at these Alaska geological colleges. Today much of our funds for these scholarships are collected through the ongoing annual membership drive.

Last year we supported 10 students with scholarships for their college progression. These students worked on Alaska studies that someday may be presented at one of our meetings.

Without you, this does not work. Without some funding, this does not work.

Fall is our traditional membership drive period. Kirk Sherwood sent a note out reminding you about renewing your fees. This month’s president letter is a follow up to this request. There are several ways you can help us out.

1) Become a paying member of the association. Nothing is stronger than a note supporting the colleges of science that includes over 300 paying members.

2) Recruit additional members. Think about former colleagues who worked in Alaska, but may have moved on to other locations. We are sure they would enjoy hearing what going on back in Alaska

3) Ask your company to help with the AGS. Ask them to donate directly to our scholarship funds. Ask them to have all geoscience team members join our organization.

4) Purchase advertising in our newsletter.

5) Ask to present at one of the monthly talks.

Our website [WWW.ALASKAGEOLOGY.ORG](http://WWW.ALASKAGEOLOGY.ORG) will help you with membership. You can also call any of the officers for more information.

In summary, please help us to continue supporting the geoscience research and student study programs in the State of Alaska.

Thanks again,
Steve Carhart
Alaska Geological Society Hosts USGS Public Assessment Review

The USGS is conducting an updated assessment of technically recoverable oil and gas resources of the Central North Slope (between NPRA and ANWR) and adjacent state waters. In preparation for the upcoming assessment, a public geology review meeting will be held in Anchorage on November 19, 2019. Primary objectives are to (1) present the geological framework on which the assessment will be based and (2) solicit feedback from the geological community regarding the geology and interpretations that represent the foundation of the assessment. An overview of methodology also will be included.

The meeting will be hosted by the Alaska Geological Society and held at the BP Energy Center, 900 East Benson Blvd, Anchorage. The presentation and discussion will be held from 8:30 to 11:30 a.m., and USGS personnel also will be available for expanded discussions in a smaller room from 1:00 to 4:00 p.m. Remote participation via WebEx type connection will be available.

Attendance is open to anyone interested in the scientific foundation on which the assessment will be conducted. Feel free to send any questions to Dave Houseknecht at dhouse@usgs.gov
Dana Coffield, PhD. (1958-2019)

Dana Coffield, a former member of the AGS, tragically died while on a backcountry skiing trip in the Canadian Rockies on Saturday, April 20th, 2019. At the time he was skiing with two others on the Des Polius Glacier on the Wapta Icefield when he was caught in an avalanche. His two colleagues survived, but unfortunately, Dana died as a result of his injuries while being transported to hospital in Calgary. He was 61 years old and was an experienced mountaineer and a successful petroleum geologist.

Dana graduated in geology from the Colorado School of Mines in 1981 and then went on to complete a Master’s Degree in 1984 followed by a PhD in 1988 at the University of South Carolina. In 1988 he joined ARCO International in Los Angeles as an exploration geologist and then moved to Plano Texas when the International headquarters was transferred there 1989. This was followed by assignments in Indonesia and Alaska. In 1998 he and his family moved from Alaska to Alberta where he joined AEC/Encana as their International New Ventures Manager. In 2005 he co-founded Gran Tierra Energy Inc., and went on to become their President & CEO – being responsible for successful exploration campaigns in Columbia and other South American countries. He parted ways with the company in 2015 and then served at CEO of Corvus Resources from 2016-18 and then as a director for Amerisur PLC., until his untimely death. He lived with his wife Denise in Canmore, Alberta.

As an active member of the AGS, Dana gave a memorable luncheon presentation in 1996 entitled “Uplift & Exhumation of Mount Everest, Nepal.” During 1990 he successfully summited Mount Everest on May 10th, as part of the ‘American Everest/Lhotse Expedition,’’ which saw the U.S., Soviet and Chinese mountaineers climb the 29,028’ peak together. The group included Sir Edmund Hillary’s son and the first Soviet women to reach the summit. On the way, he collected a suite of 13 rock samples along a 50 km long traverse up the south (foreland) flank of Mount Everest over a range of elevations from 8,400’ to the actual summit for apatite and zircon fission track analyses. With the help of an ARCO colleague Steve Bergman, they accurately determined for the first time the spectacular uplift history of Mount Everest as a result of the collision of the Gondwana derived India plate with the Eurasian landmass. In June 1998 Dana helped lead the AGS Haul Road Field trip from Fairbanks to the North Slope. At Prudhoe Bay he gave a detailed account of North America’s largest conventional oilfield and the latest efforts and technology applications being used to extract the remaining oil potential.

Dana is survived by his wife Denise and their two accomplished daughters. Sara is a professional ballerina with the Royal Swedish Ballet and Alex is a Fashion Styling Assistant in New York City. He will be sadly missed by his family and friends together with those people who knew him from the geological and mountaineering communities.

Dick Garrard, August 2019
Dana Coffield in the red anorak center with a group of ARCO geoscientists at the Endicott Island, Beaufort Sea (courtesy of BP) in June 1998.

Crossing the Arctic Circle during the AGS Haul Road Geological Field Excursion in June 1998. Dana is located in the center of the photograph immediately in front of the globe.

Dana Coffield on the summit of Mount Everest on May 10th, 1990 together with 13 geological samples that would accurately date the age and uplift history of the India-Asia continental collision.
Of special interest to Alaskan Rock hounds is the recent appearance of the revised and expanded version of “ROCKHOUNDING ALASKA”. It can be purchased at Title Wave Books, REI, Amazon, and Fred Meyers.

AUTHOR BIO: Montana Hodges is a geologist and science writer who has worked in Alaska since 2005. In 2016 she completed her doctorate in paleontology at the University of Montana on the Triassic-Jurassic mass extinction. Her dissertation had a special emphasis on the marine fossils from the Kenai Peninsula thanks to the support of the Alaska Geological Society. Today Dr. Hodges works as a professor of geology at Sierra College in Northern California and continues her research during summer trips to Alaska. Current Alaskan projects by Dr. Hodges and her research group include paleontological investigations of Denali National Park’s remote Shella-barger Pass as well as expansions of the Kenai Peninsula project. Her publications have appeared in scientific journals such as Lithosphere and GSA Today, as well as popular press such as Falcon Guides and numerous newspapers and magazines.
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<tr>
<td>Oct 23, 2018</td>
<td>11:45 am</td>
<td>AGS</td>
<td>Chad Hults, National Parks “Service 3D modeling and detailed digital elevation mapping in Alaska National Parks”</td>
<td>BP Energy Center, Anchorage</td>
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<td>Nov 4 – 8, 2018</td>
<td>11:45 am</td>
<td>AMA</td>
<td>Alaska Miners Association. Annual convention, exhibition and short courses</td>
<td>Dena’ina Center, Anchorage</td>
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<td>Nov 20, 2018</td>
<td>11:45 am</td>
<td>AGS</td>
<td>John Lyons, USGS, “Can you hear me now? Monitoring and studying active volcanoes with low frequency sound in Alaska, Hawaii, and beyond”</td>
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<td>Jan 10, 2019</td>
<td>11:45 am</td>
<td>GSA/AGS</td>
<td>John Thornley, Golder Associates, “Update on the November 30, 2018 Anchorage earthquake – A geotechnical perspective”</td>
<td>Conoco Phillips, Anchorage, ATO-1</td>
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<td>Feb 21, 2019</td>
<td>11:45 am</td>
<td>AGS/AMA</td>
<td>Rick Van Nieuwenhuysen (President and CEO of Trilogy Metals Inc), “Copper in the Ambler Mining District and the Green Energy and Transportation Revolution - Part of the Problem or Part of the Solution?”</td>
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<td>March 14, 2019</td>
<td>11:45 am</td>
<td>AGS/GSA</td>
<td>Rob Witter, USGS, “Ground failures induced by seismic shaking during the 2018 Anchorage, Alaska M7 earthquake”</td>
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<td>April 23, 2019</td>
<td>11:45 am</td>
<td>AGS/GSA/SPE</td>
<td>Joint AGS/GSA/SPE presentation, Shuvajit Bhattacharya (UAA), Old Tax-Credit Subsurface Data and New Analytics: Implications for Improved Subsurface Interpretation and Skilled Workforce Development</td>
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<td>May 15, 2019</td>
<td>5:00 pm - 8:30 pm</td>
<td>GSA</td>
<td>GSA 2019 Spring Scholarship Picnic</td>
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<td>May 29, 2019</td>
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<td>AGS</td>
<td>Laura Gregersen, Alaska DOG, “The history and aerial distribution of exploration drilling targets categorized by play type, North Slope and offshore arctic Alaska”</td>
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<td>May 30, 2019</td>
<td>7:00 am - 5:00 pm</td>
<td>AOGA</td>
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<td>May 31, 2019</td>
<td>9:30 am - 4:00 pm</td>
<td>AOGA</td>
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<td>August 12, 2019</td>
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<td>Pedro A Restrepo-Pace, Oil Search Ltd., “Technical Progression in Tackling the Papua New Guinea Fold Belt: A Fit for Purpose Tool-kit, a Learning Curve and the Persistence that Led to Success in One of the Most Challenging Surface and Geological Settings”</td>
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<td>Greg Wilson, ConocoPhillips, A Regional look at Nanushuk Formation facies in outcrop, Brooks Range Foothills, Alaska”</td>
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<td>11:45 am</td>
<td>AGS</td>
<td>Tom Homza, Shell Exploration &amp; Production, “Deconvolving Alaska’s Barrow Arch”</td>
<td>BP Energy Center, Anchorage</td>
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<td>Dec 17, 2019</td>
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<td>BP Energy Center, Anchorage</td>
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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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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. This newsletter is the monthly (September-May) publication of the Alaska Geological Society, Inc. 300+ newsletters delivered electronically per month.

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MEMBERSHIP INFORMATION
AGS annual memberships expire November 1. The annual membership fee is $25/year ($5 for students). 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: 907-334-5337)

All AGS publications are now available for on-line purchase on our website. Check to see the complete catalogue:
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Contact Keith Torrance at 907-952-1288 for advertising information.

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Contact Steve Carhart: steve_carhart@hotmail.com
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*Student member* - $5
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