Williston Basin: Bridging the Gap between Academia and Industry, for the Next Set of Challenges in Energy Transition

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Abstract

In the world of transition to clean-energy, and the rising demand of base-metal (Cu, Ni, Co, Li, Nb), are we ready to catch up with this demand and more importantly, safely, and sustainably reach those goals? This demand for base-metals, markedly exceeding the discovery rate of new deposits, requires enormous technological developments in exploration success. With our core competencies, the important question is—how ready are we as geoscientists? In this presentation, I wish to share few knowledge integrations on general ideas of paleoceanography and trace metals and show some innovative implications. Williston Basin is one of the best archives of core materials, covering almost entire Phanerozoic—major mass extinctions, major carbon cycle perturbations, OAE's (ocean anoxic event), sea level waxing and waning, climate models, and overall link sedimentary with tectonic-magmatic systems to understand earth's ocean atmosphere as well as magmatic systems. I will share ideas stemming from core paleoceanography, but branching thoughts on Ordovician-Silurian boundary, S cycle (anhydrites and pyrites) leading to H_2S insights, Devonian mass extinctions, big-data integration, and lastly, perhaps most importantly—Lithium (Li) overview in the Williston Basin. I will close with some innovative ideas collected from my experience with energy industry (hydrocarbon and paleoceanography) to address the upcoming challenge to find enough of these base-metals or better bridge the gap between industry and academia. Perhaps we all need to be more open and work as a larger team of integrated geoscientist—provide wide-ranging templates in the search for base metals but also earth's ocean atmosphere cycles. This talk will explore our path to new directions and opportunities here at Williston Basin and expand and explore beyond our limits.