



**University of Wyoming – National Park Service  
Harlow Summer Seminars at the AMK Ranch**

**THURSDAY, JUNE 26<sup>TH</sup>, 5:30pm**

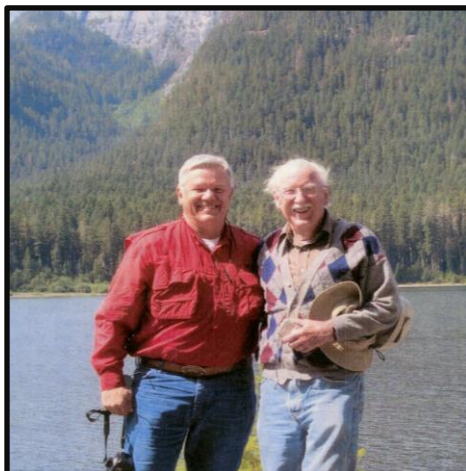
**“Global Warming and Climate Change: 45 Million Year Old Rocks in Wyoming Support the Concept”**

**RONALD SURDAM**

**University of Wyoming Professor of Geology & Geophysics (Ret.), and  
Director of the Wyoming State Geological Survey (Ret.)**

The 45 million year old Green River Formation in southwestern Wyoming is an ideal laboratory to study climate change. The Eocene Green River Formation was deposited in ancient Lake Gosiute. Lake Gosiute was located in a closed hydrographic basin during most of its history. As a consequence, the position of the lake shoreline (the boundary between the lake and mudflat) was determined by the imbalance between inflow and evaporation. When the lake level was high (inflow > evaporation), oil shales were deposited; when the lake level was low (inflow < evaporation), evaporites such as trona were deposited. During transitions from high to low, or low to high, carbonate muds were deposited. Thus, the Green River Formation records in detail climatic dynamics over a period greater than one million years.

Observations from the Green River Formation illustrate that global warming and climate change prior to anthropogenic greenhouse gas (GHG) emissions are *undeniable*. The crucial question is, *are anthropogenic GHG emissions accelerating the rate of climate change?* The confluence of rising global temperatures with substantial increases in GHG emissions since the beginning of the industrial revolution strongly suggests that the answer to this question is yes. In any case, the observations from the Green River Formation demonstrate that to ignore the potential negative effects of climate dynamics is irresponsible as they may lead to catastrophic consequences.



Ron Surdam and Donald Carlisle in central Vancouver Island, British Columbia, Canada. Professor Donald Carlisle was Ron Surdam's Ph.D. dissertation supervisor (1962-1967) at UCLA.

***We will have a barbecue at 5:30 with hamburgers, veggie burgers, hot dogs, chips, salads and dessert for a \$5 donation. The talk starts at 6:30 in the historic Berol Lodge at the AMK Ranch. Turn right in the Leek's Marina parking lot in Grand Teton National Park. Reservations not required.***