Brookian Sequence Stratigraphic Framework of the Northern Colville Foreland Basin, Central North Slope, Alaska

Paul L. Decker

Alaska Department of Natural Resources
Division of Oil and Gas, 550 W. 7th Ave.,
Anchorage, AK 99501

April, 2010

NATURAL RESOURCES
DIVISION OF OIL & GAS

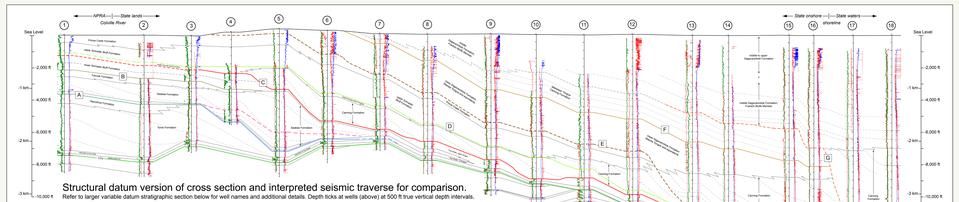
DRAFT document posted to DGGS Posters and Presentations Page

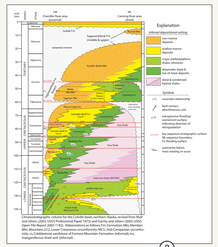
Author(s) and affiliations:
Paul L. Decker
State of Alaska, Division of Oil and Gas

Date presented:
April 21, 2010

Presentation Forum:
2010 DNR Spring Technical Review Meeting, ConocoPhillips Alaska office complex, Anchorage, Alaska

Acknowledgments of any external funding sources and in-kind contributions:
Funding for this project was provided by the State of Alaska general operating budget. Related survey studies were conducted in collaboration with geologists of the Alaska Division of Geological & Geophysical Surveys, notably Warren Wartes, David Lupton, Robert Gillis, Thomas Ahern, Jeffrey Bradley, and Christopher Garrity. Seismic data courtesy of Chris Schenk. Recent field studies have been funded in part by industry contributions from Anadarko Petroleum Corp, BG Alaska, Chevron, ConocoPhillips Alaska, Inc., ENI, Petro-Canada, Pioneer Natural Resources, Plains Exploration and Production Company, and Talisman Energy. Pro/STRAT Dip, Inc., The author thanks Mr. Marvin and D. Houseknecht for their reviews of this poster. Thanks to Houseknecht sequence stratigraphic conventions, correlations, and sequence stratigraphic developments.





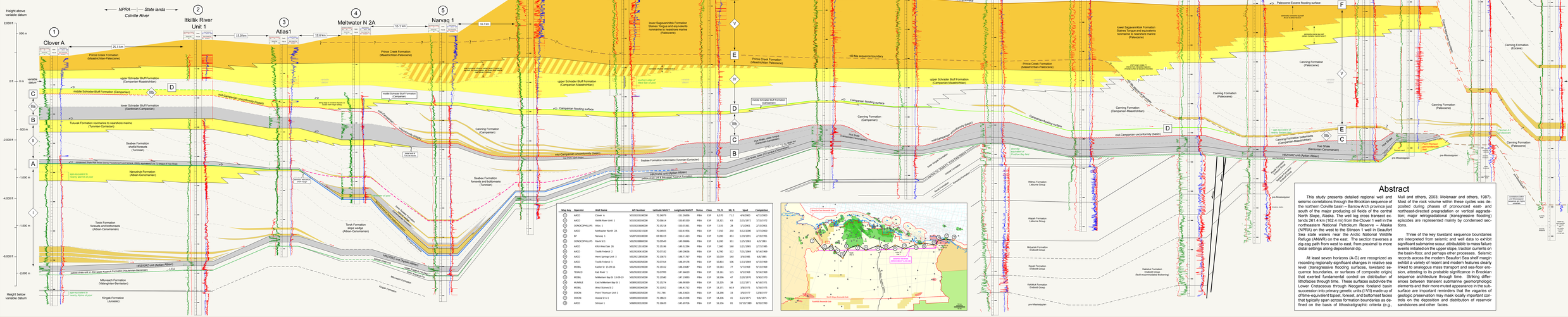
Explanation

Inferred depositional setting and/or lithology

- dominantly nonmarine (all grain sizes and coal)
- nonmarine-influenced deltaic to shallow marine (sand-prone)
- shallow marine to proximal shelf (sand-prone)
- middle shelf to slope (mud- & silt-prone)
- lower slope to basin floor fans, lobes, etc. (sand- & silt prone)
- condensed and/or bentonitic section (includes both source-prone basinal and low-energy shelfal facies)

Symbology and notation

- transgressive flooding/rainvement surface
- downlap surface
- truncation surface
- onlap surface
- B — regionally significant Brookian sequence-stratigraphic surface (A through G)
- IV — primary genetic unit (Brookian, I-VII) bounded by regional sequence-stratigraphic surfaces


NPRA — State lands
Colville River
Height above variable datum
Height below variable datum
variable datum
1 Clover A
2 Itkillik River Unit 1
3 Atlas1
4 Meltwater N 2A
5 Narvaq 1
6 Ravik St 1
7 KRU W Sak 26
8 Toolik Fed 2
9 Hemi Springs Unit 3
10 Toolik Fed 1
11 Kadler St 15-09-16
12 Kad River 1
13 Mikkelsen Bay St 13-09-19
14 E Mikkelsen Bay St 1
15 W Staines St 2
16 Pt Thomson 1
17 Alaska St A-1
18 Stinson 1
Prince Creek Formation (Maastrichtian-Paleocene)
upper Schrader Bluff Formation (Campanian-Maastrichtian)
middle Schrader Bluff Formation (Campanian)
lower Schrader Bluff Formation (Santonian-Campanian)
Tuluvak Formation nonmarine to nearshore marine (Turonian-Coniacian)
Seabee Formation shelfal forsests (Turonian)
Seabee Formation forsests and bottomsets (Turonian)
Seabee Formation bottomsets (Turonian-Coniacian)
Nanushuk Formation (Albian-Cenomanian)
Torok Formation forsests and bottomsets (Albian-Cenomanian)
Torok Formation slope wedge (Albian-Cenomanian)
HRZ/GRZ unit (Aptian-Albian)
pebble shale unit — lower upper Kuparuk Formation (Hauterivian-Barremian)
Miluveach Formation (Valanginian-Berriasian)
Kingak Formation (Jurassic)
Canning Formation (Campanian)
Canning Formation (Paleocene)
Canning Formation (Eocene)
Canning Formation (Oligocene?)
middle Sagavanirktok Formation (Oligocene and younger)
middle Sagavanirktok Formation Franklin Bluffs Member dominantly nonmarine (Eocene-Oligocene)
Mikkelsen Tongue Canning Formation nearshore topsets (Eocene)
Mikkelsen Tongue Canning Formation shelfal marine topsets (Eocene)
lower Sagavanirktok Formation Staines Tongue and equivalents nonmarine to nearshore marine (Paleocene)
Paleocene-Eocene flooding surface
Eocene sequence boundary
~60 Ma sequence boundary
Campanian flooding surface
mid-Campanian unconformity (basin)
Hue Shale (Santonian-Campanian)
upper Sagavanirktok Formation (Eocene-Oligocene)
upper Sagavanirktok Formation Staines Tongue and equivalents nonmarine to nearshore marine (Paleocene)
Prudhoe Bay field
Kuparuk River field
Milne Point field
Nikaitchuq field
Oooguruk field
Nuiqsut field
Alpine field
Colville River delta
Fiord Kekiktuk
Fiord Kingak
Fiord Torok
Fiord Nanushuk
Fiord Seabee
Fiord Sagavanirktok
Fiord Canning
Fiord Staines
Fiord Colville
Fiord Hue Shale
Fiord Pebble Shale
Fiord Kemik
Fiord Kuparuk
Fiord Miluveach