

Cook Inlet Mesozoic Subcrop

Author(s) and affiliations:

Diane P. Shellenbaum¹, Laura J. Silliphant¹, and Paige Delaney²

¹ Alaska Division of Oil and Gas

² Alaska Division of Geological & Geophysical Surveys

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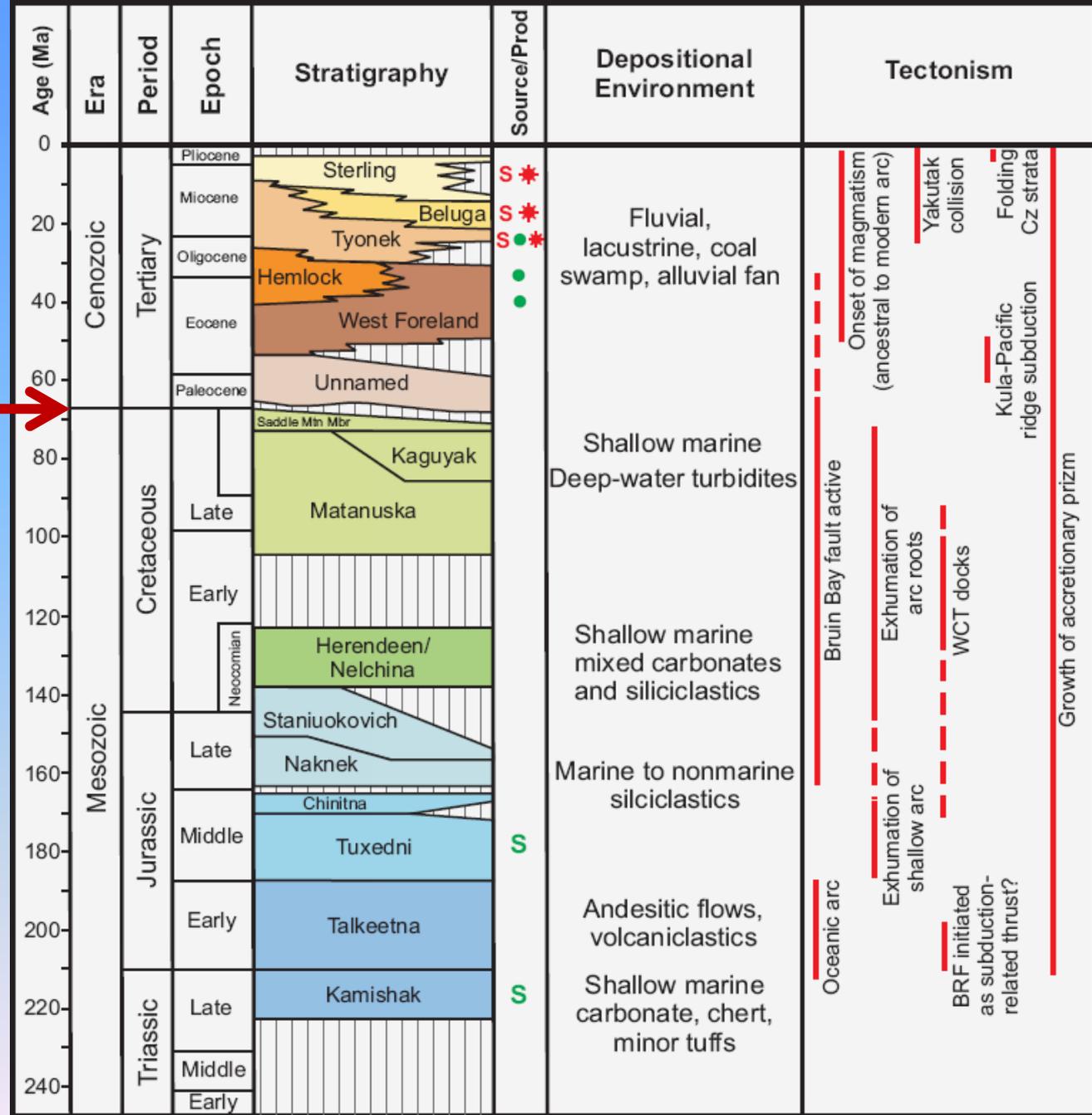
This presentation is primarily an outgrowth of internally funded, office-based studies in conjunction with the Cook Inlet Basin Reconstruction project, a joint effort of the Alaska Division of Geological & Geophysical Surveys and the Alaska Division of Oil and Gas. We thank CGG Veritas for permission to share interpretations based in large measure on their CI-88 and CI-89 marine seismic surveys.

Cook Inlet Mesozoic Subcrop

- Create Base Tertiary Depth Map
- Pick Mesozoic tops – (logs, Amstrat, AGS, PI sources, licensed seismic, Zippi paly study, outcrop)
- Review Core
- Interpret Subcrop
- Final Products: Subcrop Map and Cross
Sections

Cook Inlet Strat Column

Base Tertiary /
Top Mesozoic
Unconformity



Redrawn from Curry and others (1993) and Swenson (2003); additional information from Plafker and others (1989) and Nokleberg and others (2004)

CI-88, CI-89 Veritas Marine Spec



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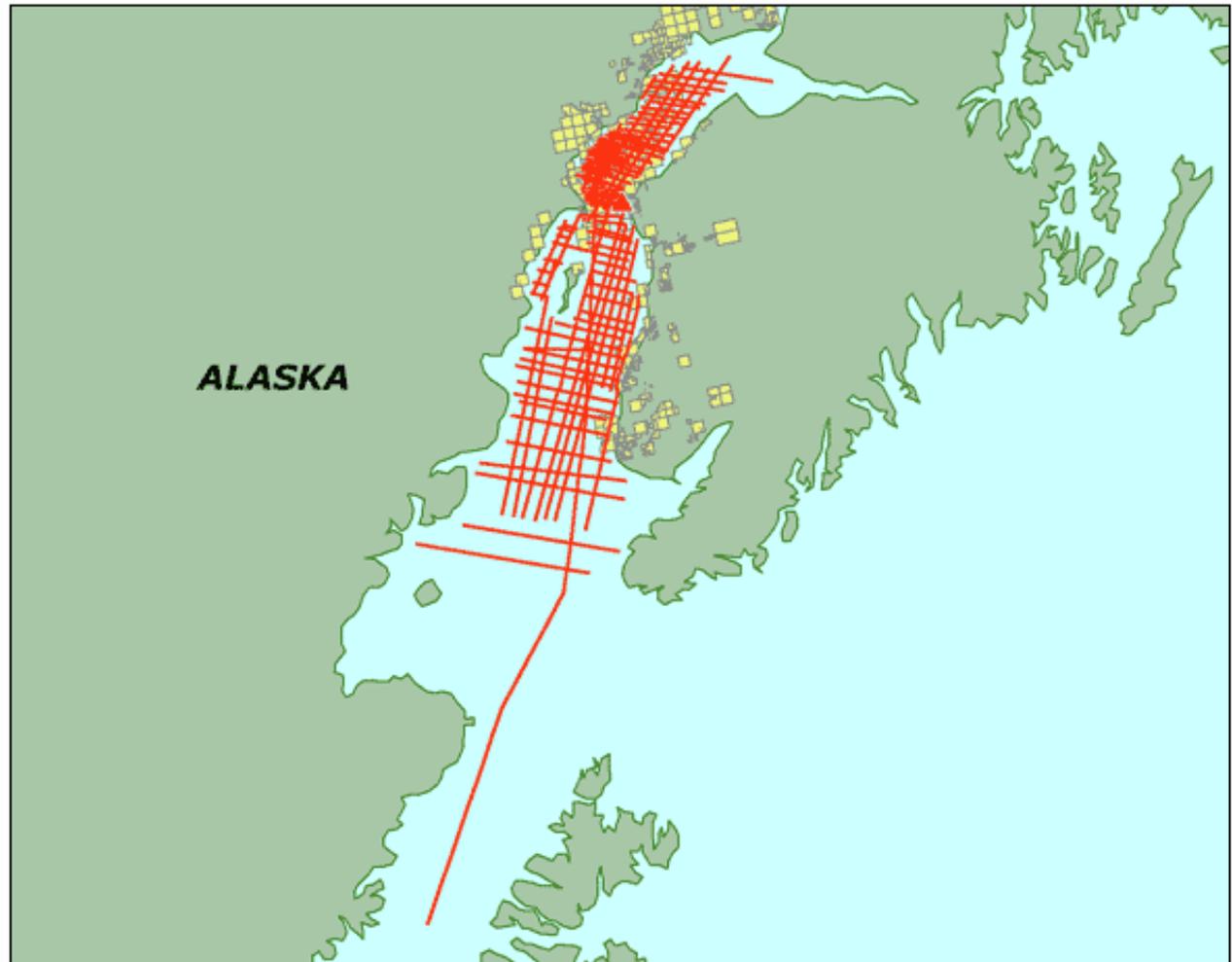
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Alaska

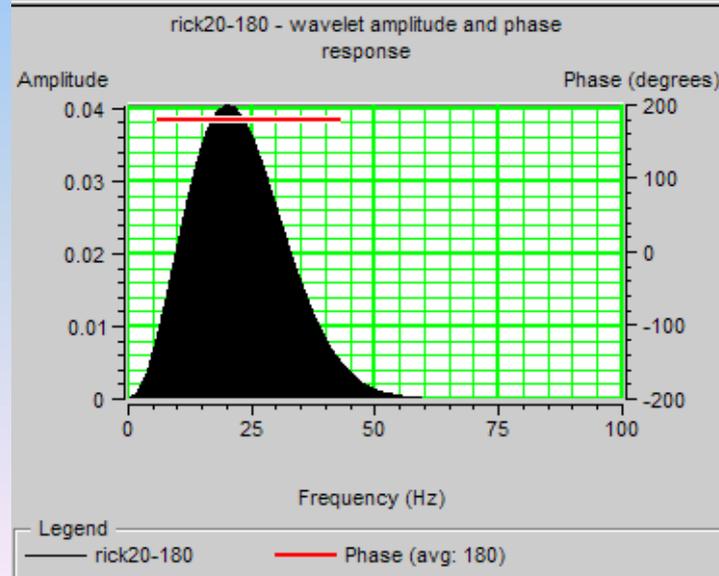
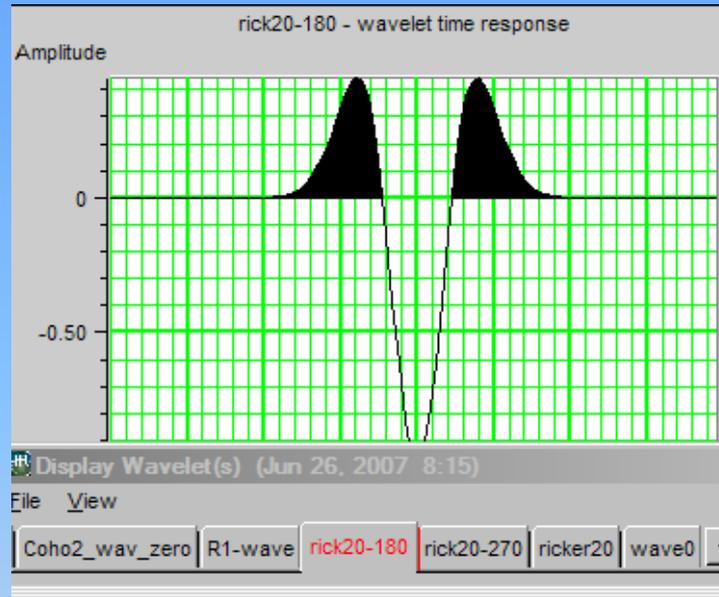
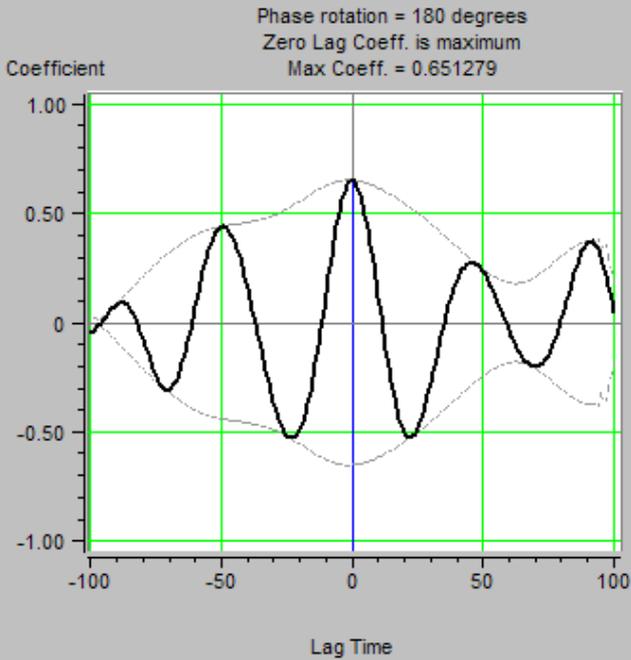
- > [Chukchi Sea](#)
- > [Cook Inlet](#)
- > [Navarin Basin](#)
- > [Trading Bay](#)

Cook Inlet: 2,204.9 miles



Coho 2 Synthetic - Best Seismic Tie

180 degrees, 20 hz ricker



Resolution ~ 110 ft

= 1/4 dominant wavelength

wavelength = v/f

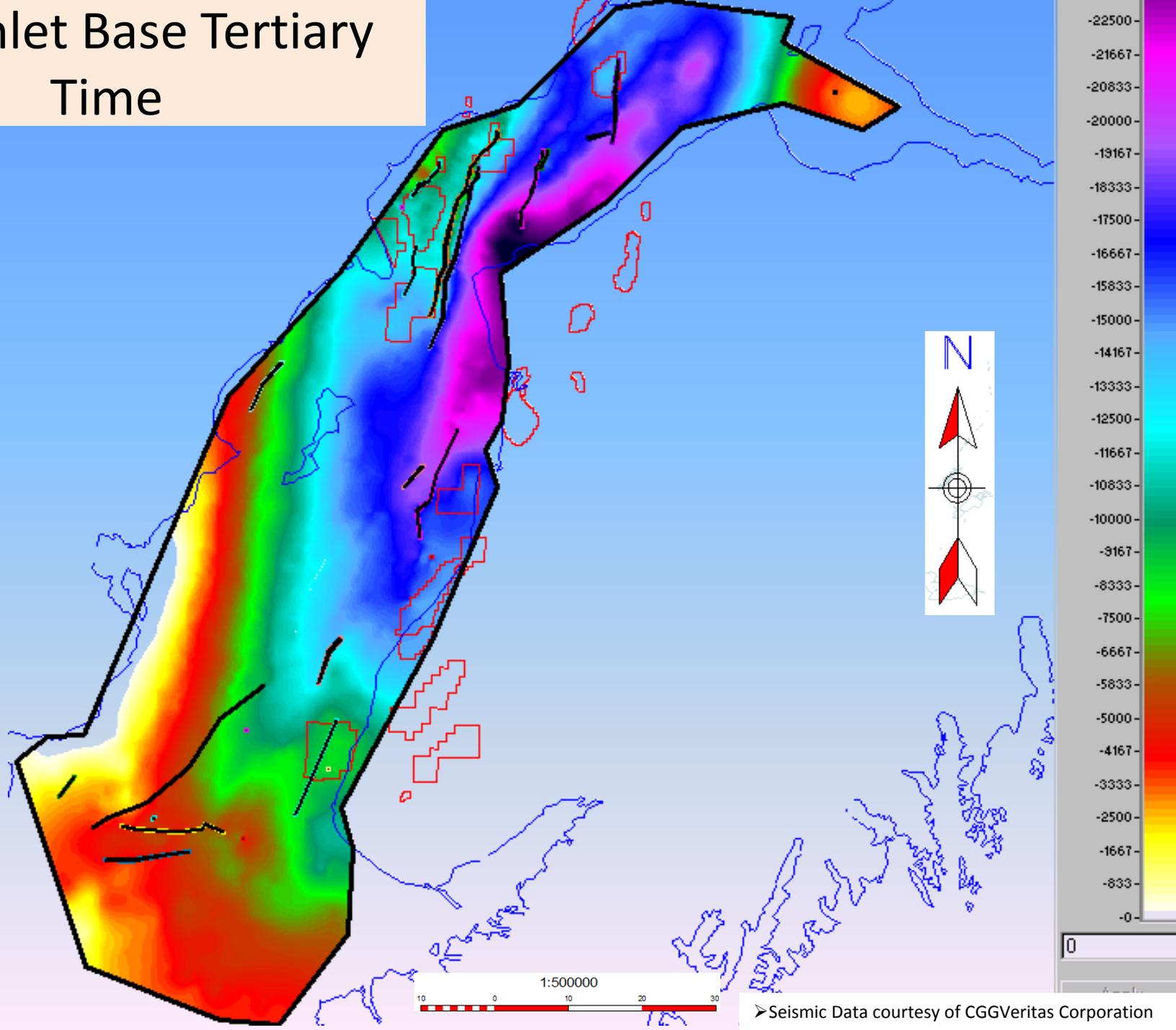
= $(8800 \text{ ft/sec} / 20 \text{ cycles/sec}) = 440 \text{ ft}$

= 1/4 (440 ft)

= 110 ft

Detection ~ 20 ft

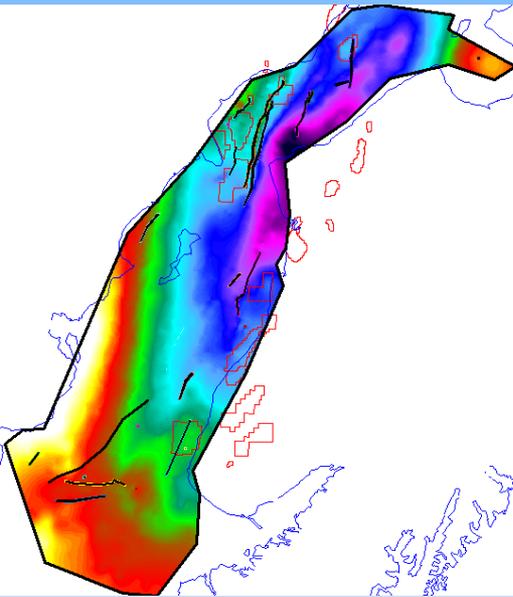
Cook Inlet Base Tertiary Time



Time to Depth process

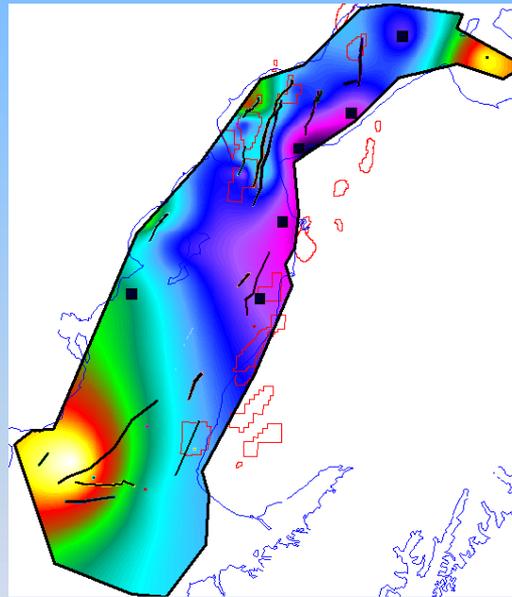
Seismic one-way time (sec) x Velocity (feet/second) = Depth (feet)

Time



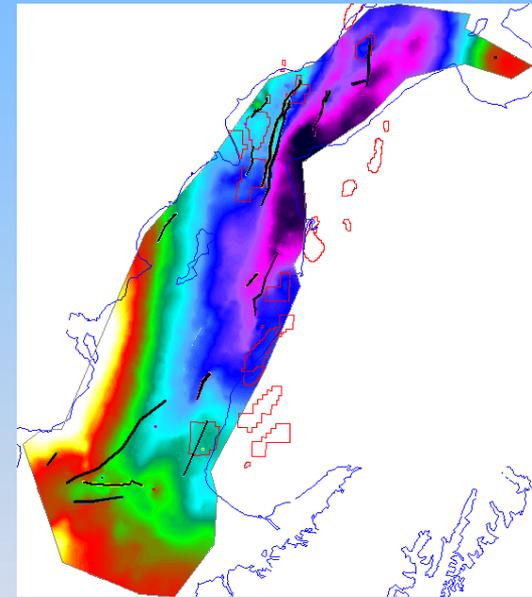
X

Pseudo Velocity



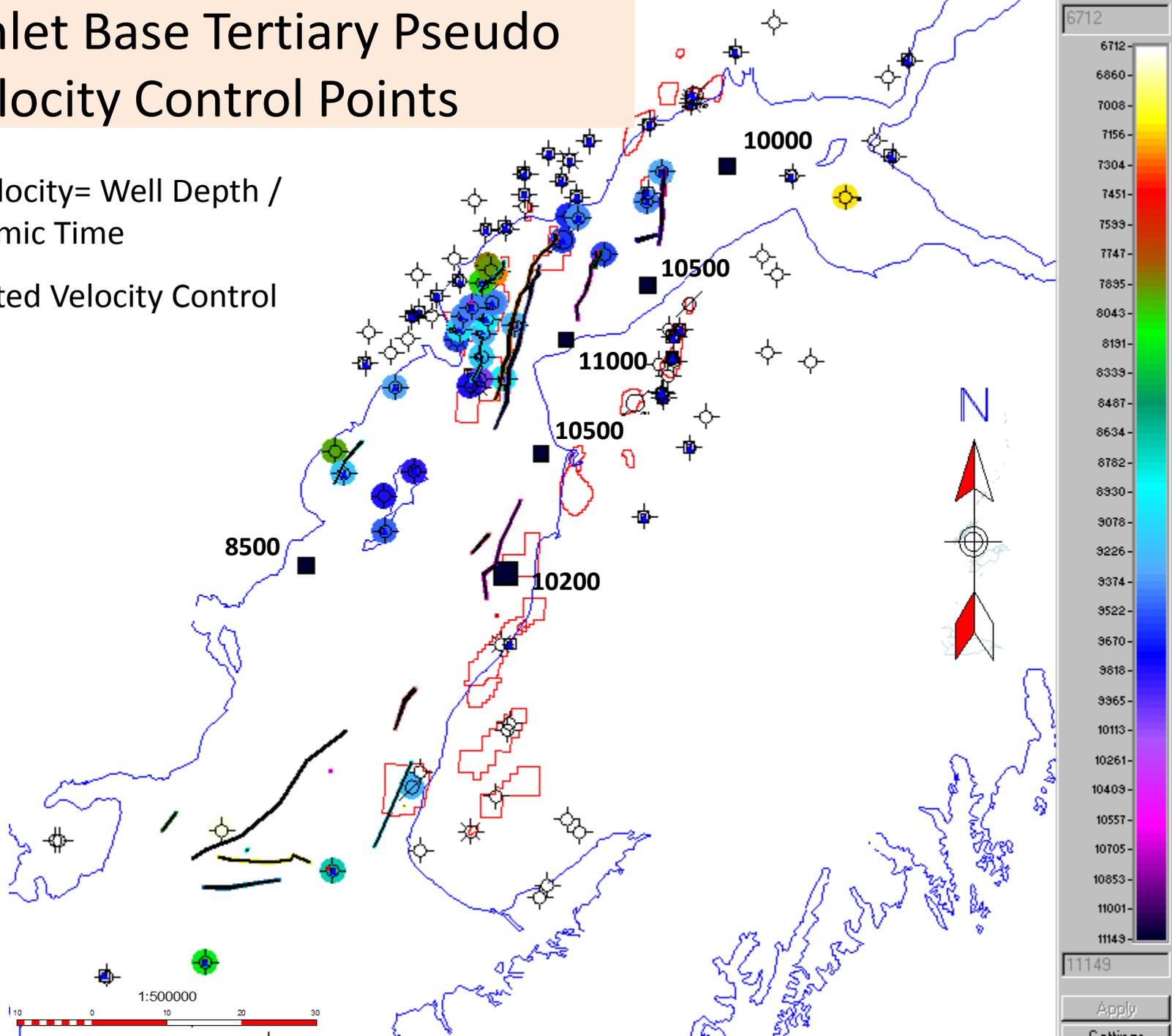
=

Depth

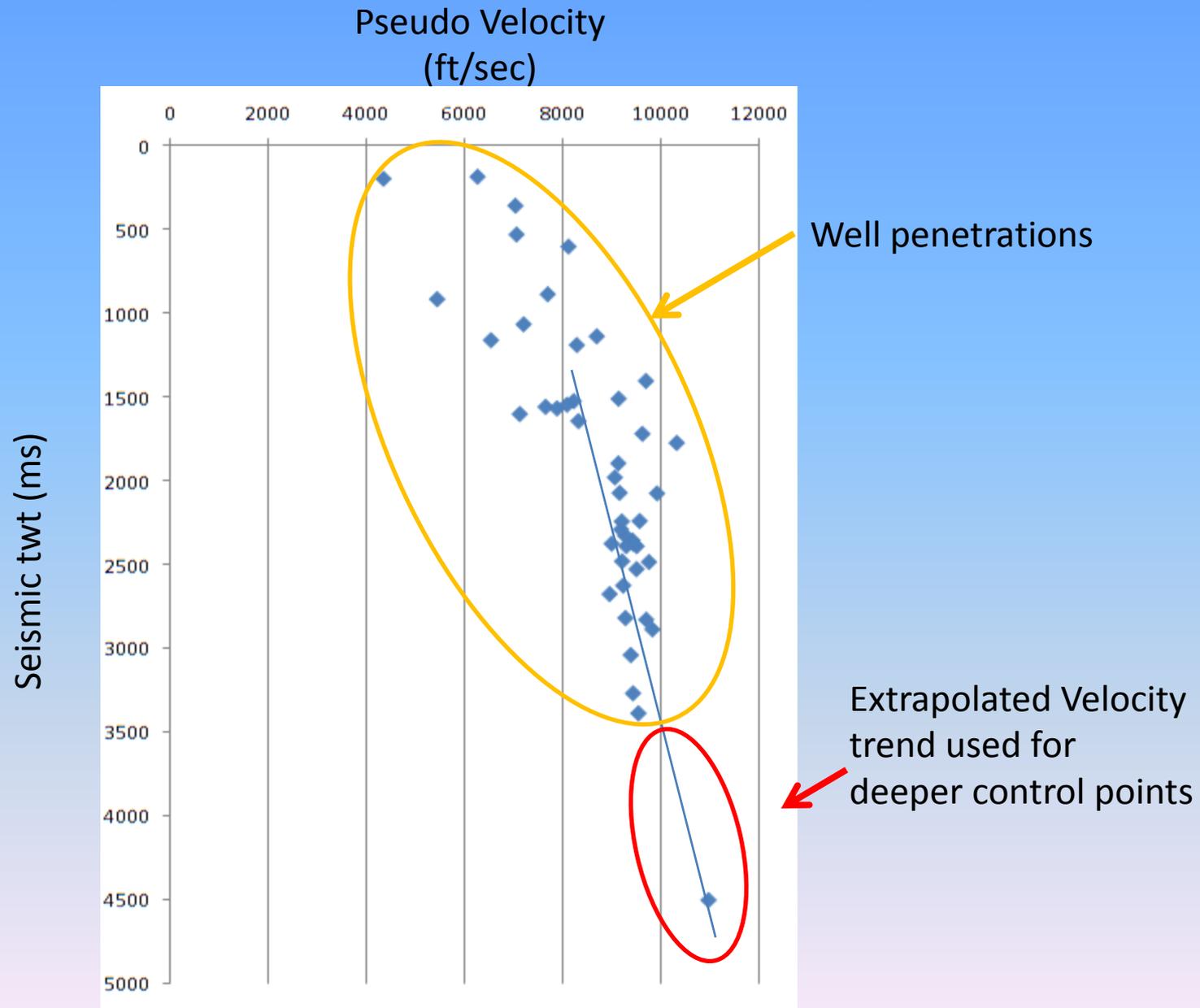


Cook Inlet Base Tertiary Pseudo Velocity Control Points

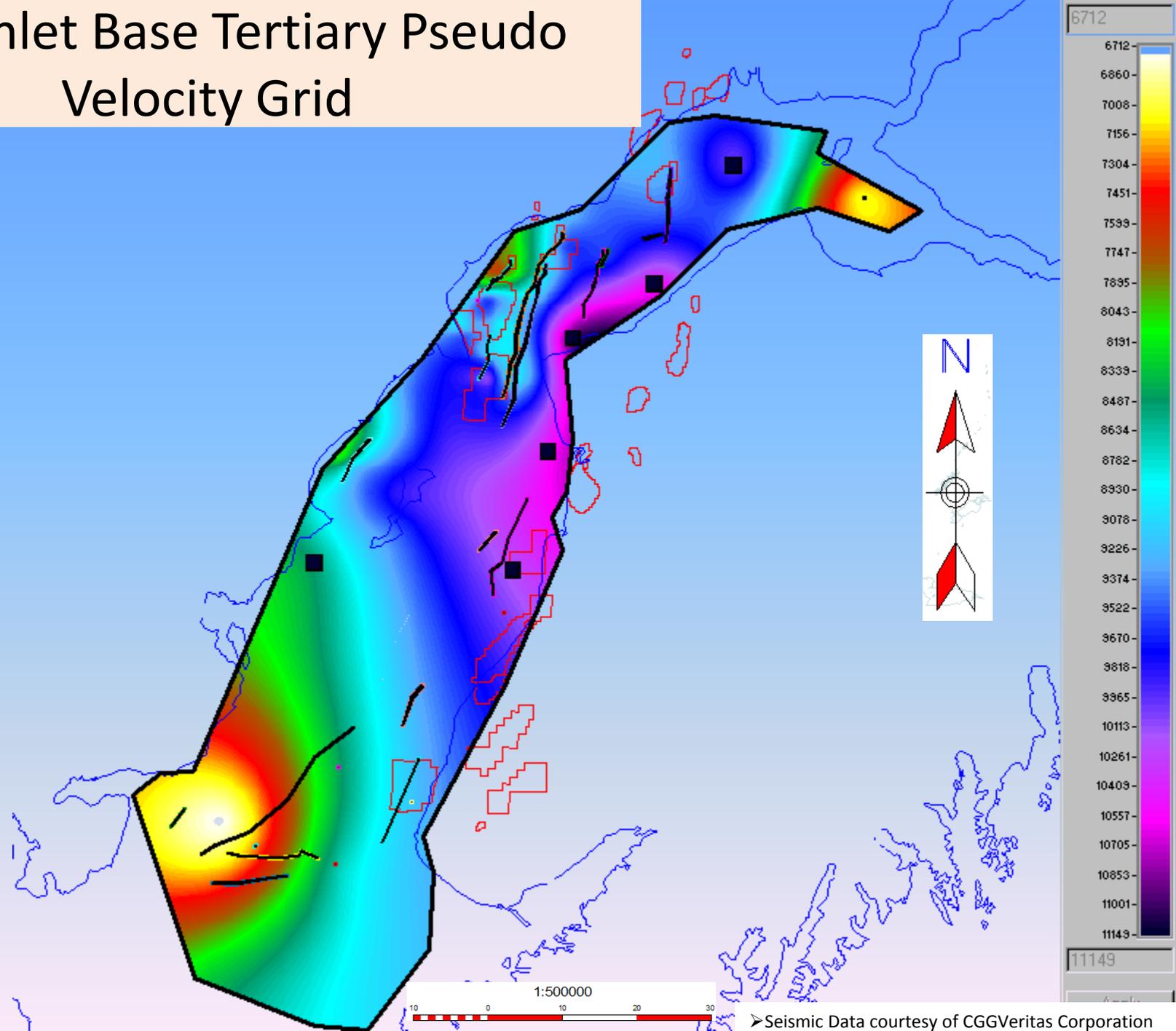
- Pseudo Velocity= Well Depth / 1 way Seismic Time
- Extrapolated Velocity Control



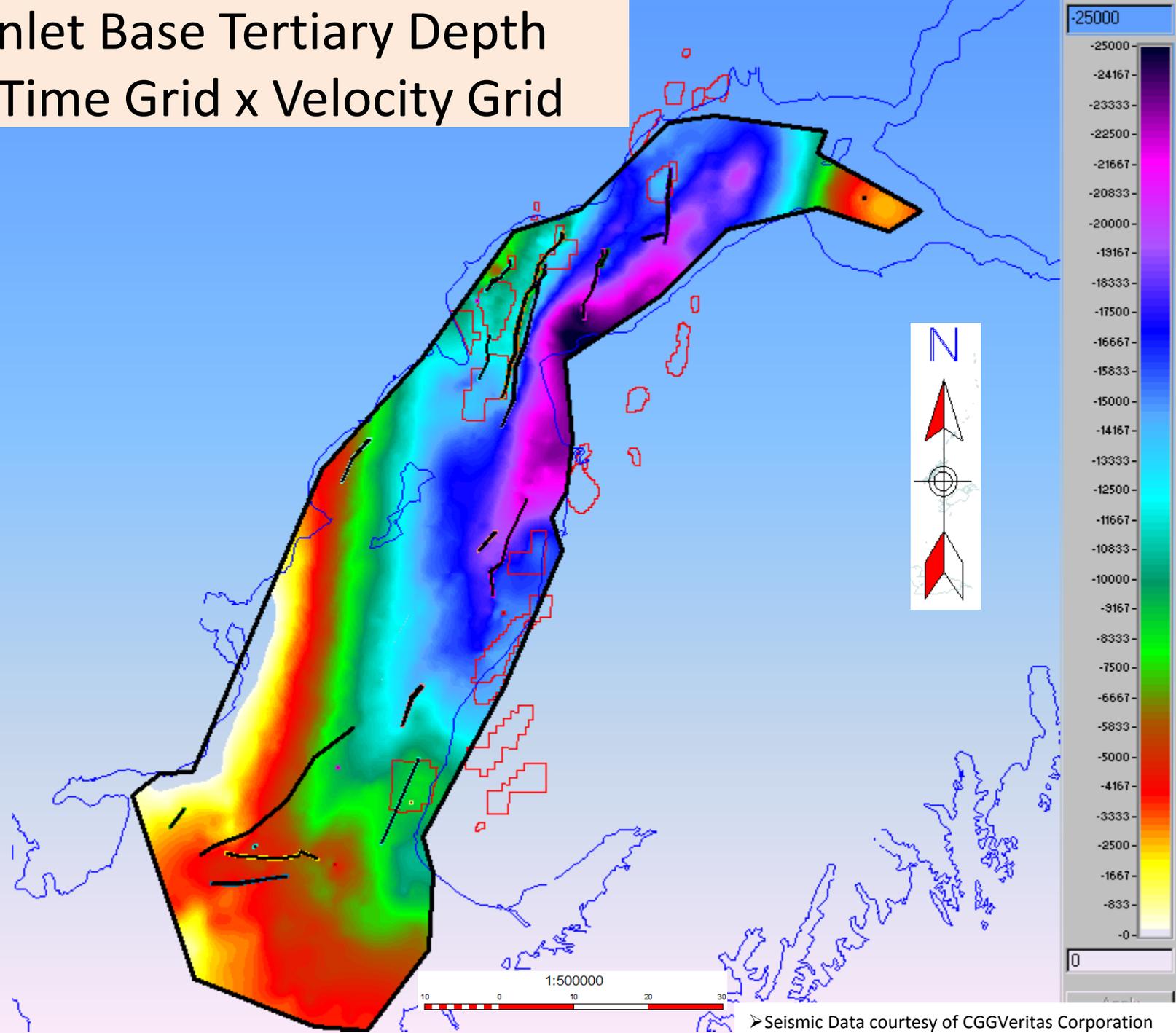
Velocity Control Point Methodology



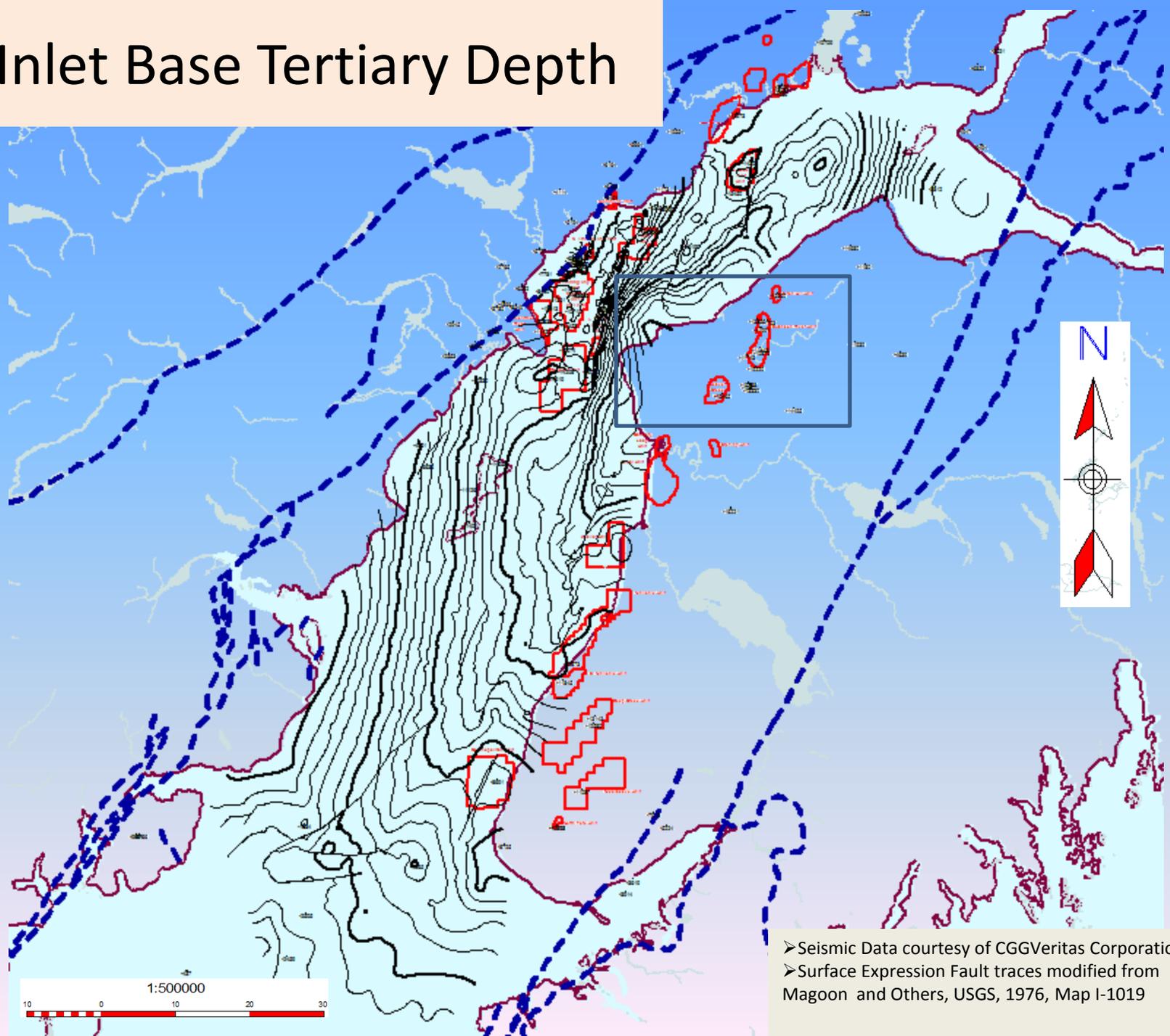
Cook Inlet Base Tertiary Pseudo Velocity Grid



Cook Inlet Base Tertiary Depth
= 1WT Time Grid x Velocity Grid

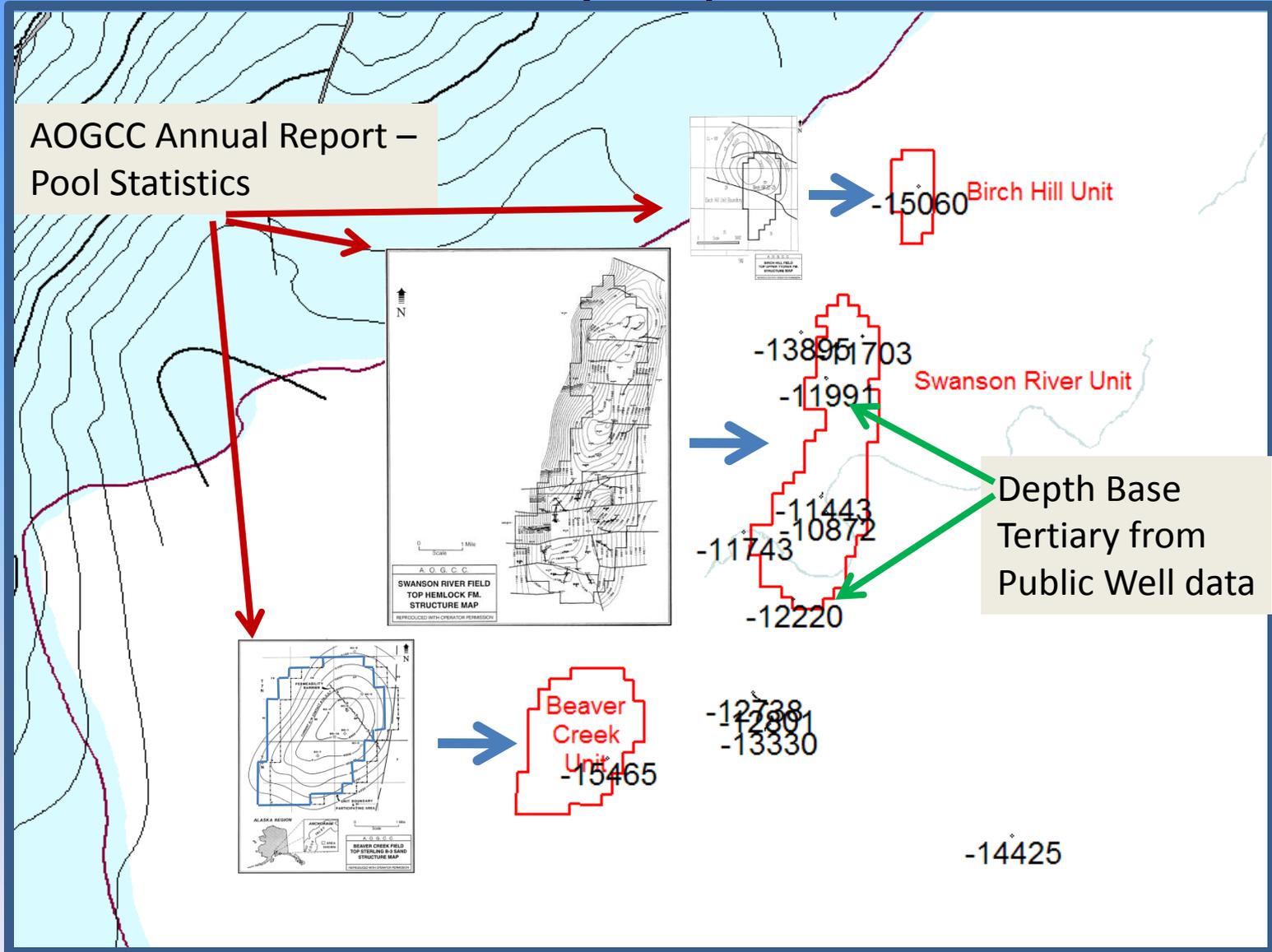


Cook Inlet Base Tertiary Depth



➤ Seismic Data courtesy of CGGVeritas Corporation
➤ Surface Expression Fault traces modified from Magoon and Others, USGS, 1976, Map I-1019

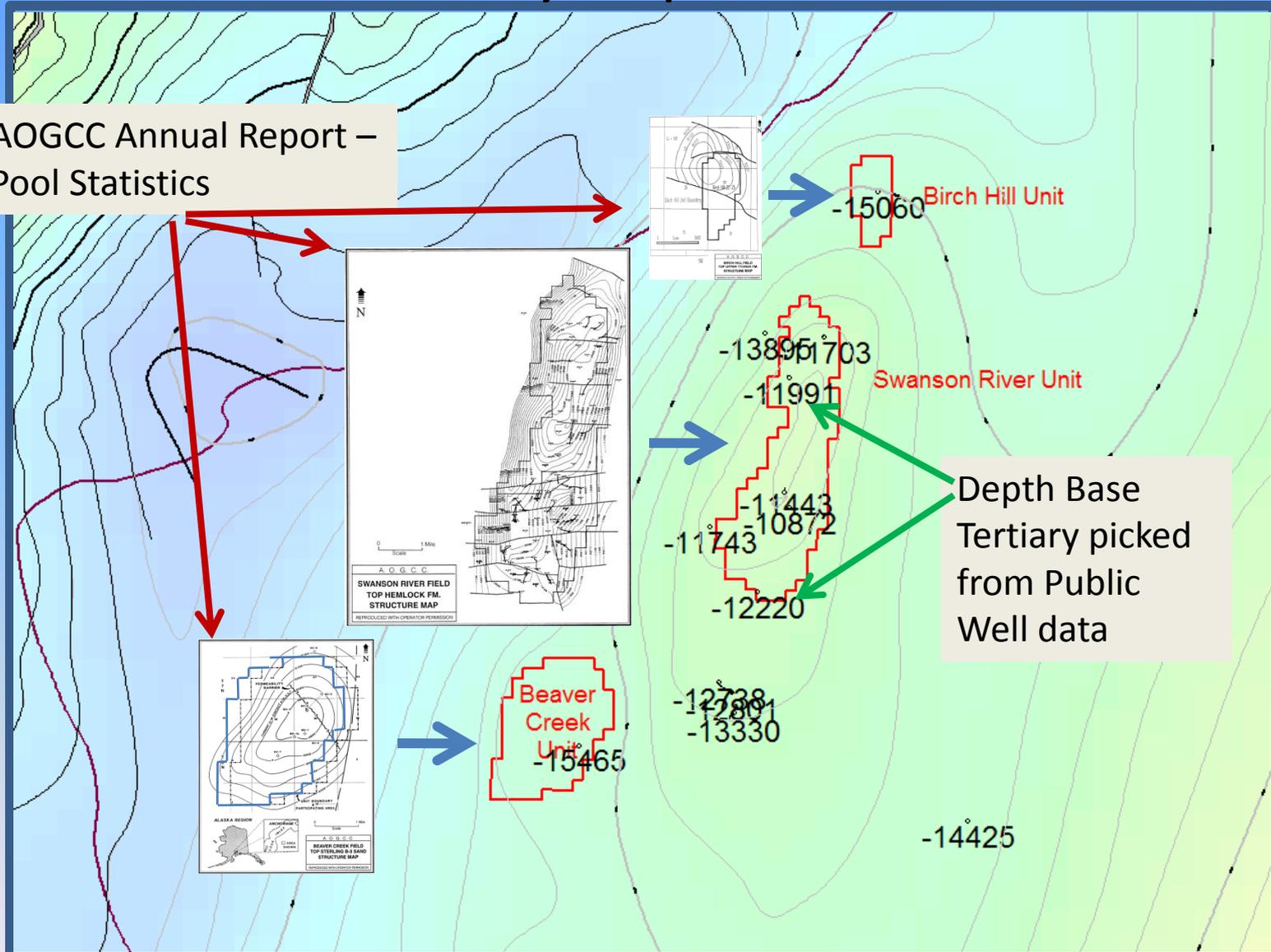
Cook Inlet Base Tertiary Depth



Cook Inlet Base Tertiary Depth



AOGCC Annual Report –
Pool Statistics



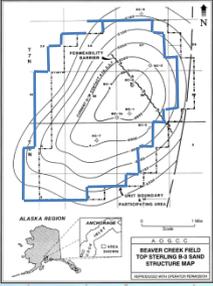
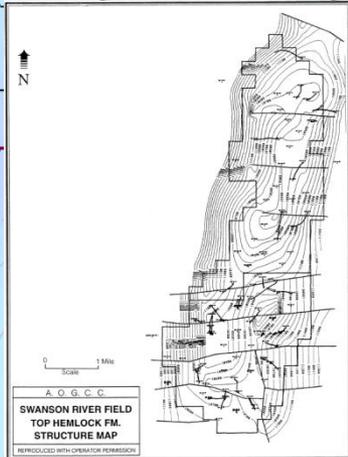
-15060 Birch Hill Unit

-13895
-1703
-11991 Swanson River Unit
-11443
-10872
-11743
-12220

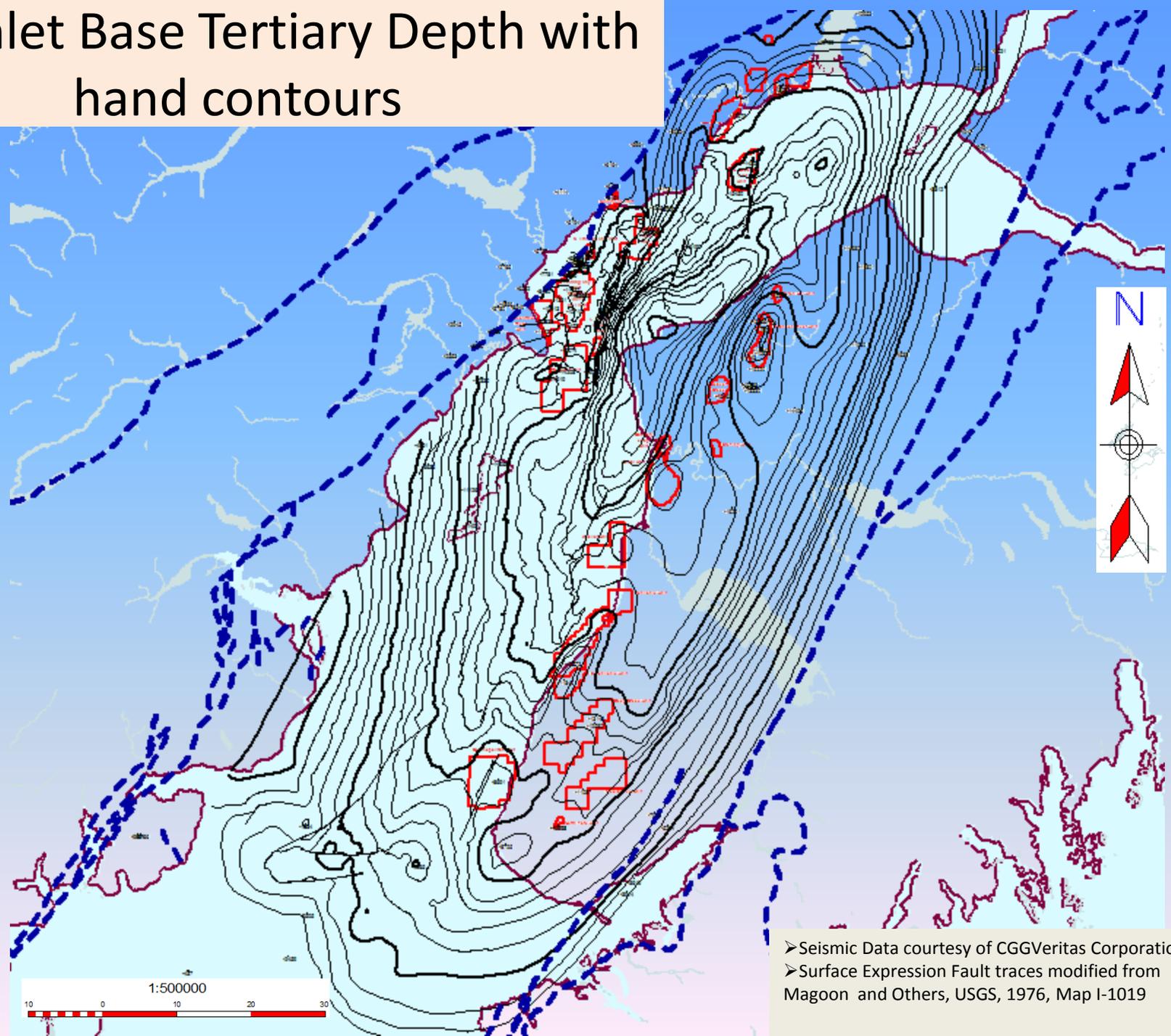
Depth Base
Tertiary picked
from Public
Well data

Beaver
Creek
Unit
-15465

-14425

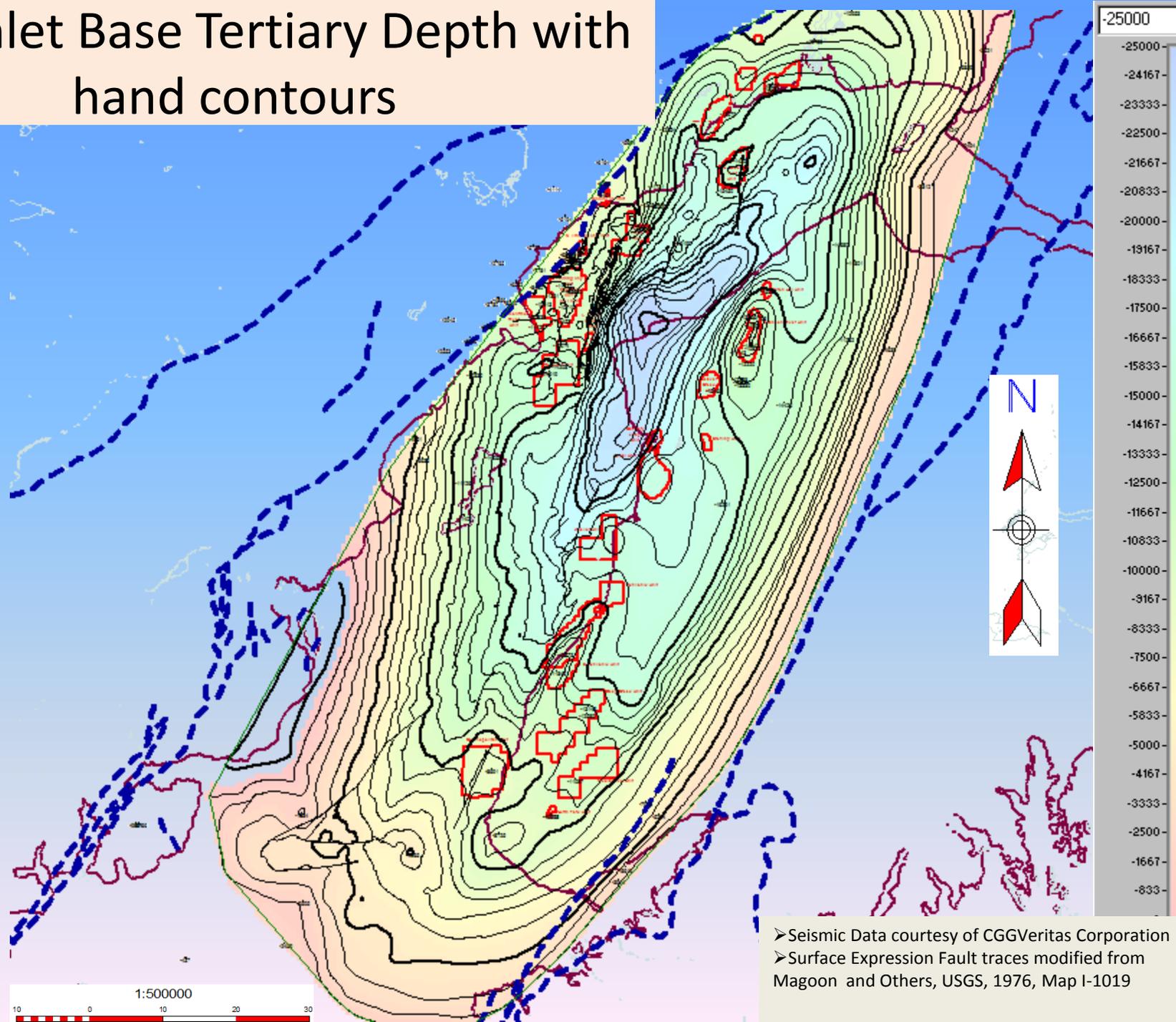


Cook Inlet Base Tertiary Depth with hand contours



➤ Seismic Data courtesy of CGGVeritas Corporation
➤ Surface Expression Fault traces modified from Magoon and Others, USGS, 1976, Map I-1019

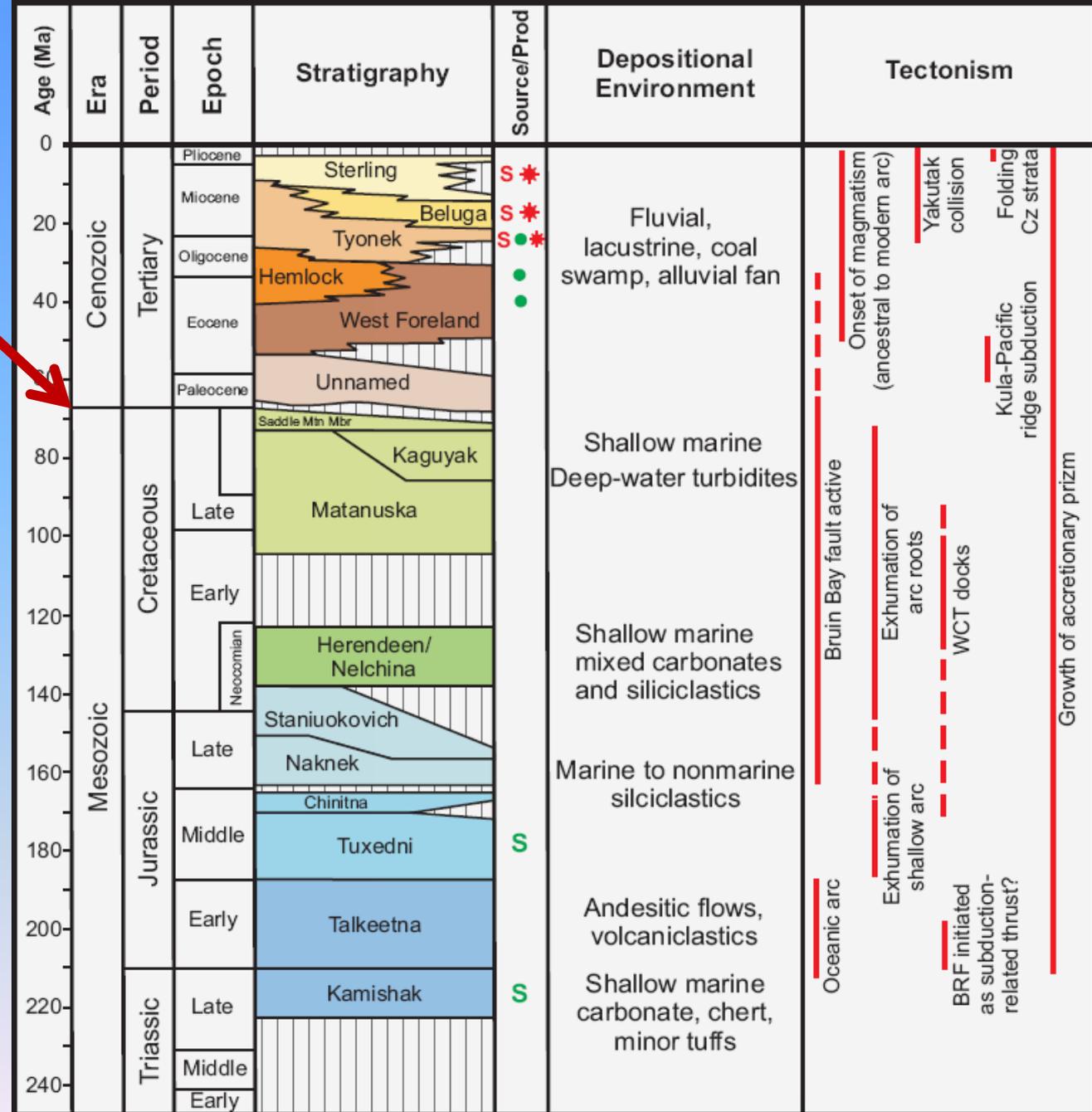
Cook Inlet Base Tertiary Depth with hand contours



Cook Inlet Mesozoic Subcrop

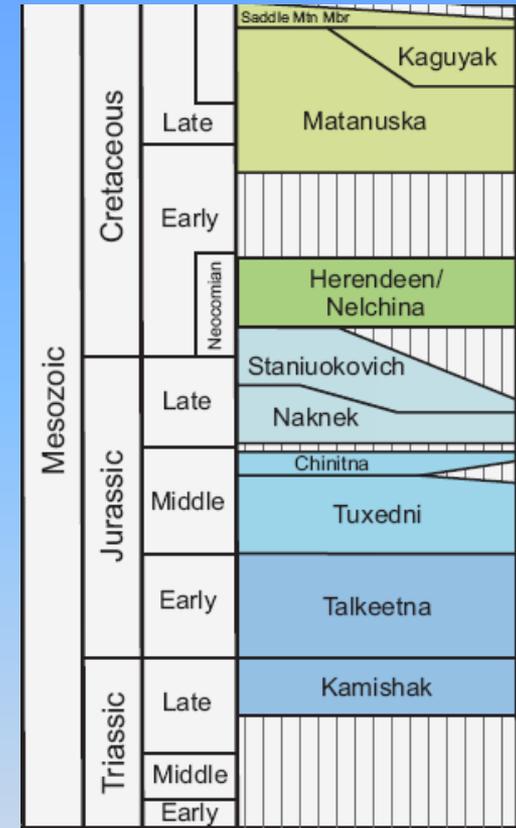
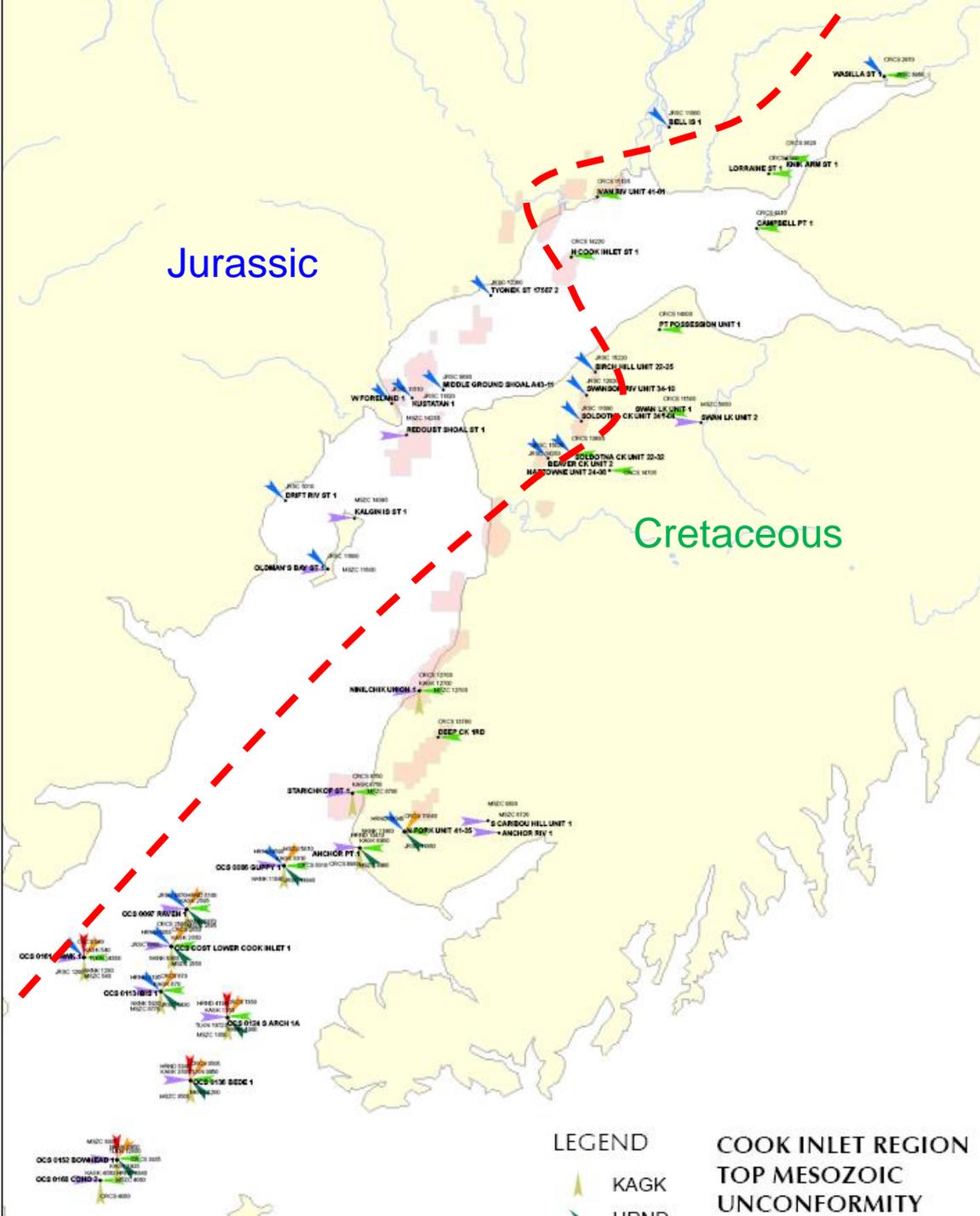
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Base Tertiary Unconformity



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AGS Tops



LEGEND

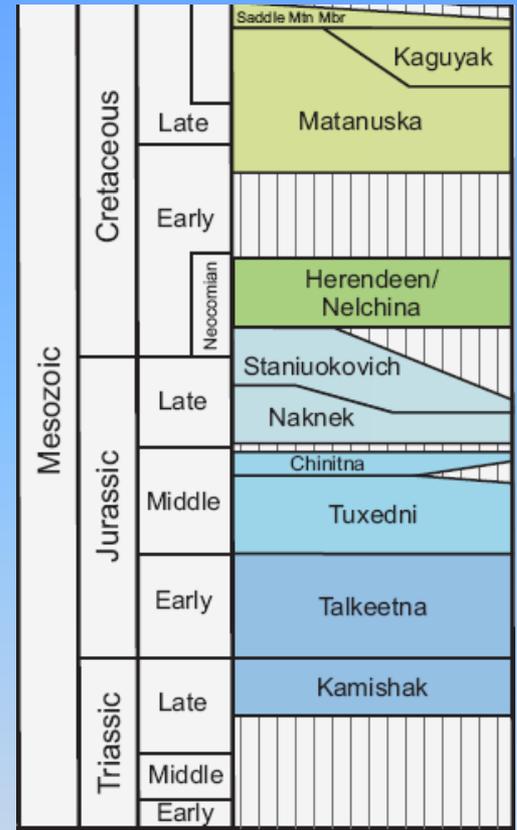
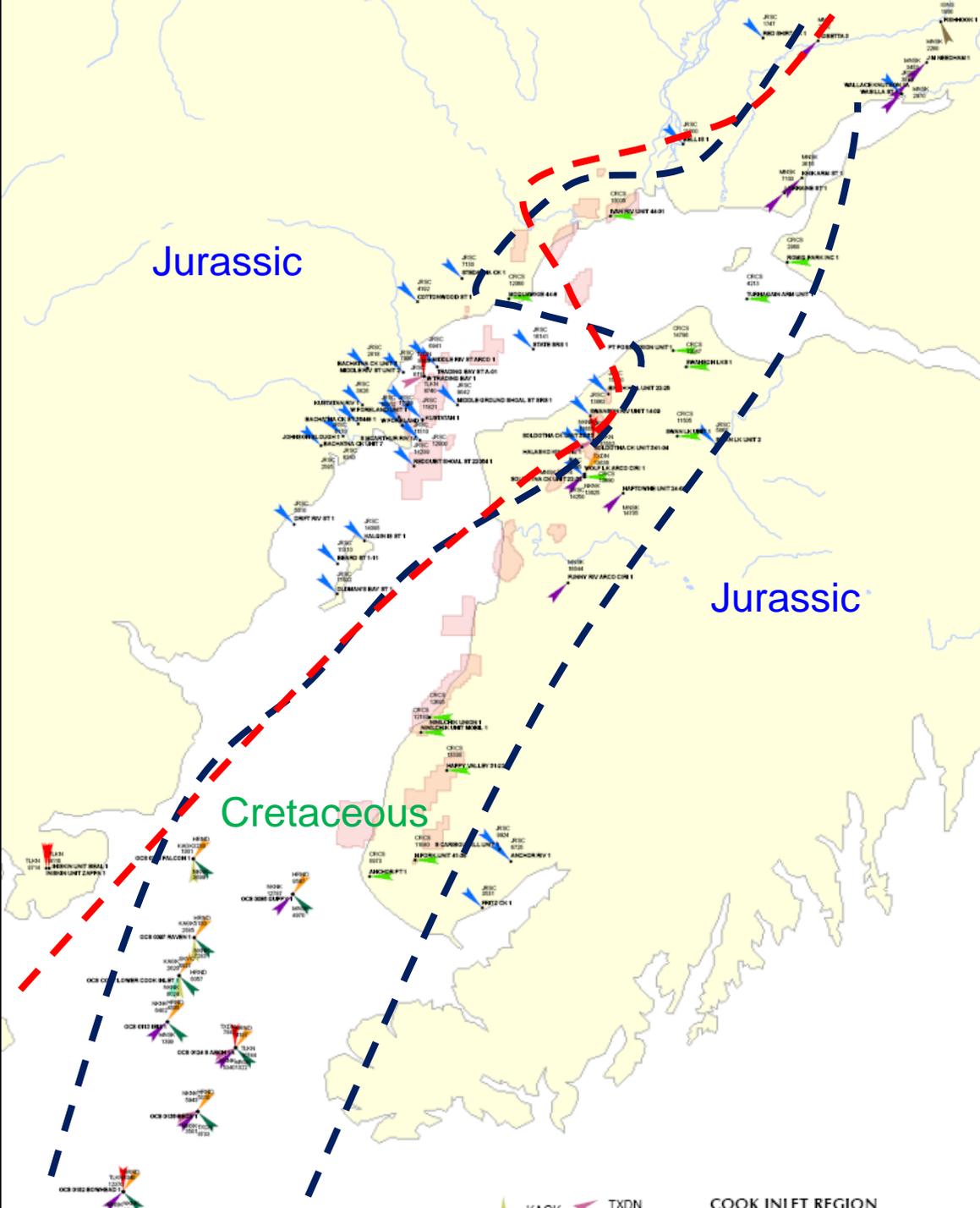
- KAGK
- HRND
- CRCS
- NKNK
- TLKN
- JRSC
- MSZC

COOK INLET REGION TOP MESOZOIC UNCONFORMITY subcrop picks

AGS sources only DRAFT 03/06/08



Amstrat Tops



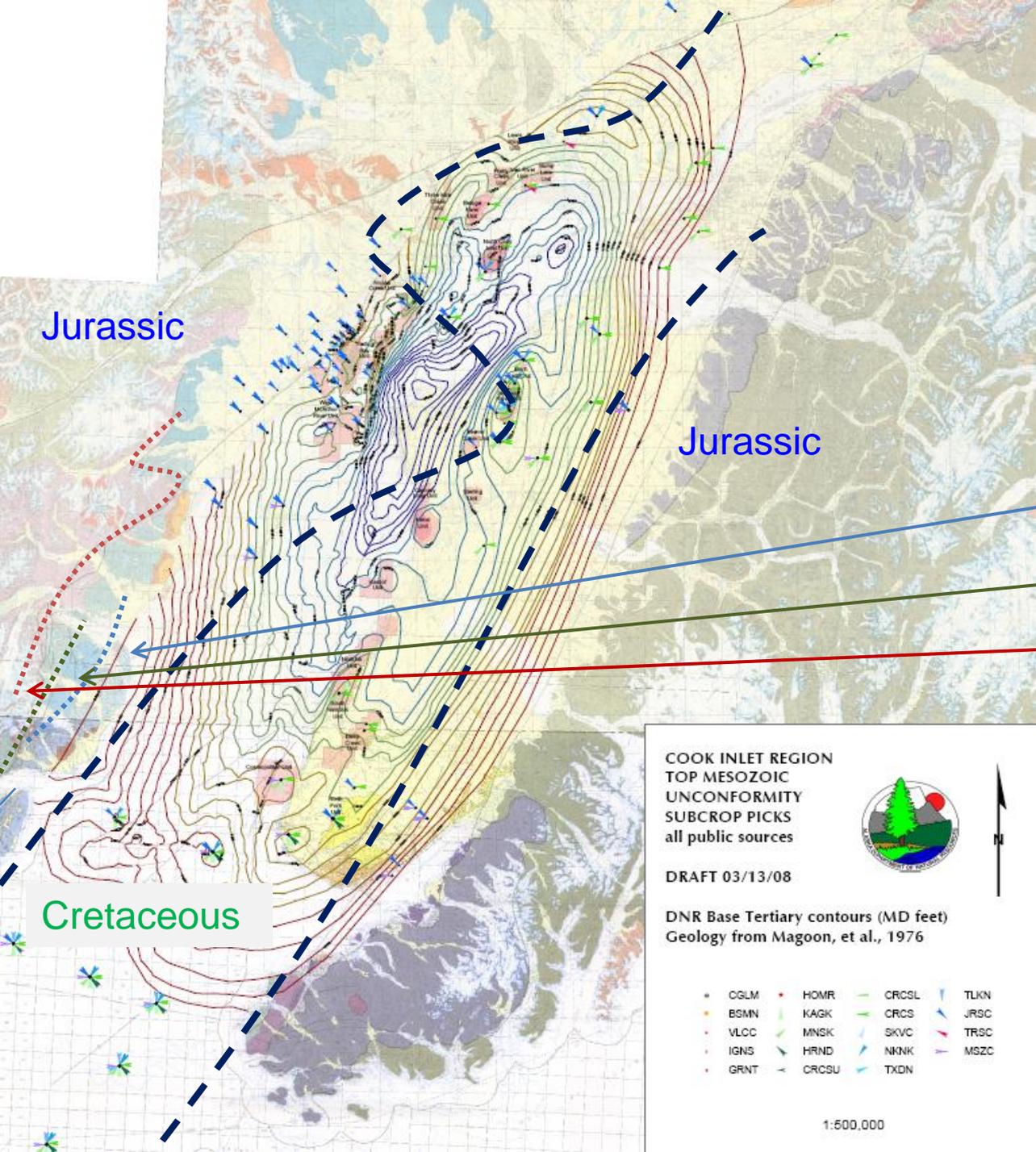
- TXDN
- TLKN
- JRSC
- IGNS
- MSZC

**COOK INLET REGION
TOP MESOZOIC
UNCONFORMITY
subcrop picks (MD)**

**AMSTRAT sources only
DRAFT 03/07/08**



All Public Tops



Mesozoic	Cretaceous	Late	Saddle Mn Mbr
			Kaguyak
			Matanuska
	Early		
		Neocomian	Herendeen/ Nelchina
	Jurassic	Late	Staniukovich
			Naknek
		Middle	Chinitna
			Tuxedni
	Triassic	Early	Talkeetna
Late		Kamishak	
	Middle		
	Early		

COOK INLET REGION
TOP MESOZOIC
UNCONFORMITY
SUBCROP PICKS
all public sources

DRAFT 03/13/08

DNR Base Tertiary contours (MD feet)
Geology from Magoon, et al., 1976

- OGLM
- BSMN
- VLCC
- IGNS
- GRNT
- HOMR
- KAGK
- MNSK
- HRND
- CRCSU
- CRCSL
- CRCS
- MNSK
- SKVC
- NKNK
- TXDN
- TLKN
- JRSC
- TRSC
- MSZC

1:600,000

➤ Geologic Map -Magoon and Others, USGS, 1976, Map I-1019

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Sections

CO₂ Sequestration

Estimate CO₂ storage capacity for:

- Depleted oil and gas fields
- Saline reservoirs
- Coal seams

Working with DOE Westcarb, annual meeting this fall in Alaska