North Africa Research Group

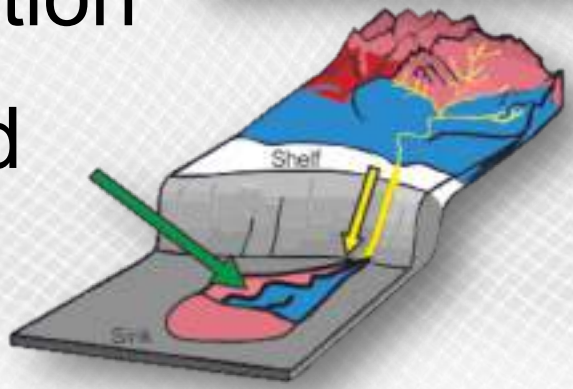
Source to sink: A provenance study of Cretaceous sediments, Senegal NW Africa

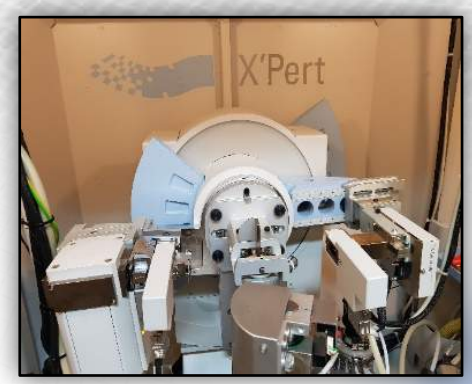
Ian Mounteney: MPhil (year 1 of 2)
Supervisors: Jonathan Redfern, Stefan Schroeder and Giovanni Bertotti and Max Casson

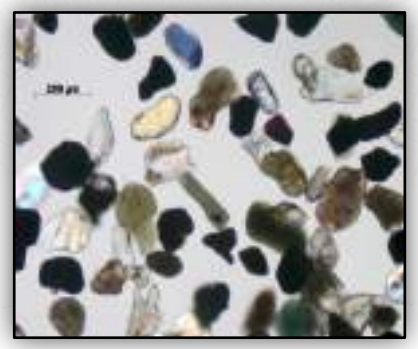
MANCHESTER 1824
The University of Manchester

Presentation:

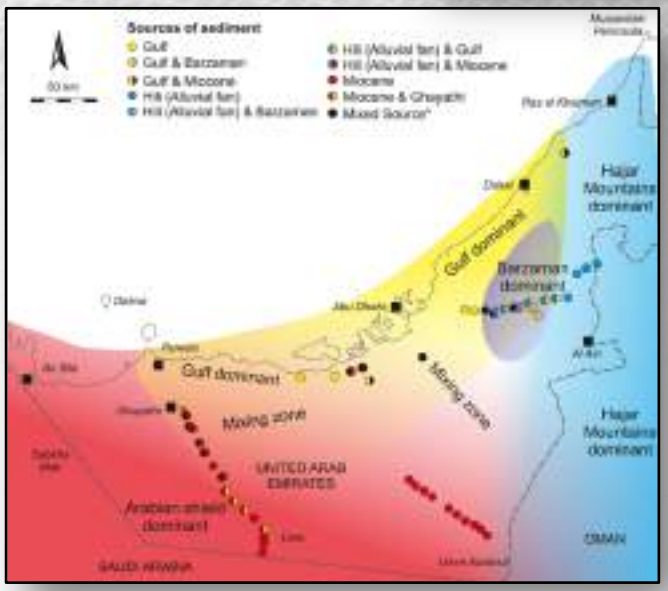
- Who am I?
- Project location
- Background
- Aims
- Methods
- Initial results
- Next stage…

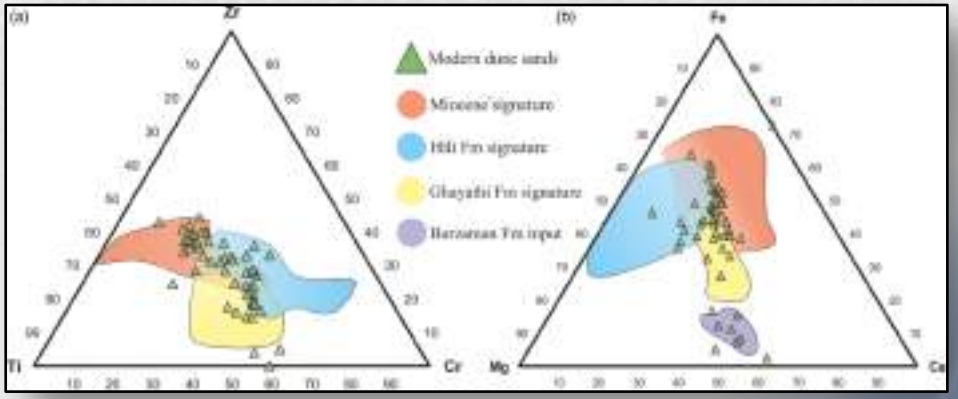






My introduction





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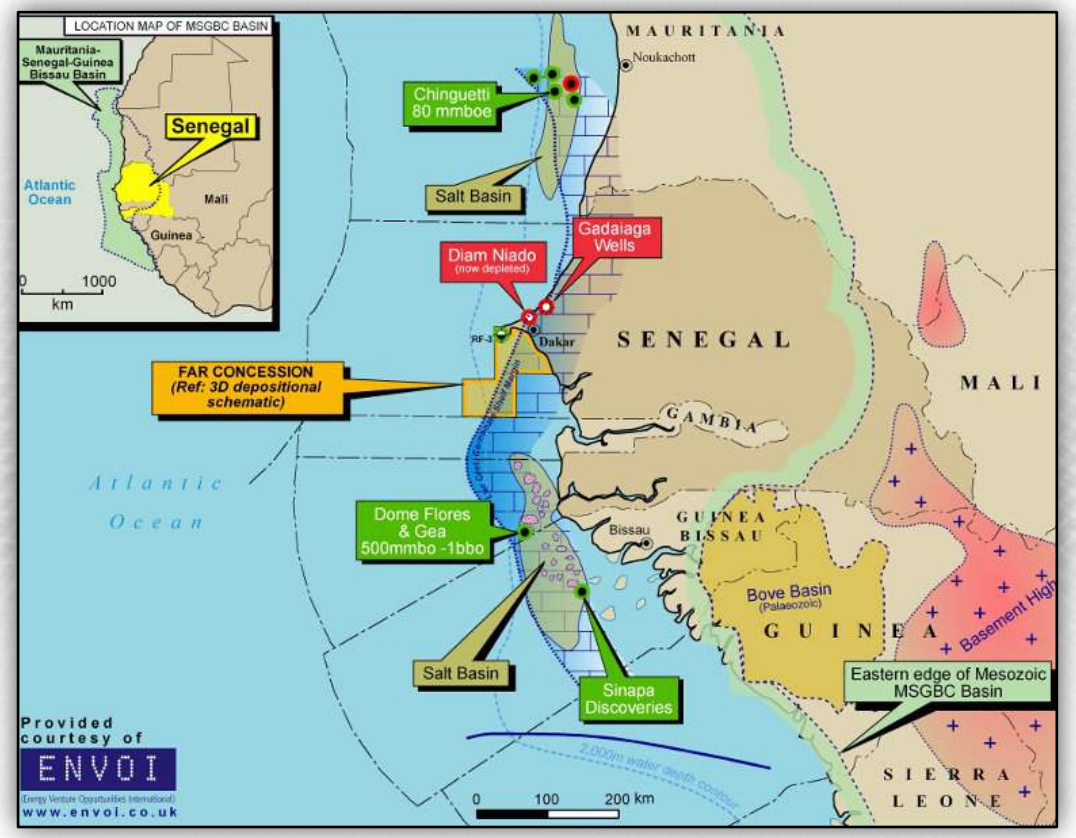
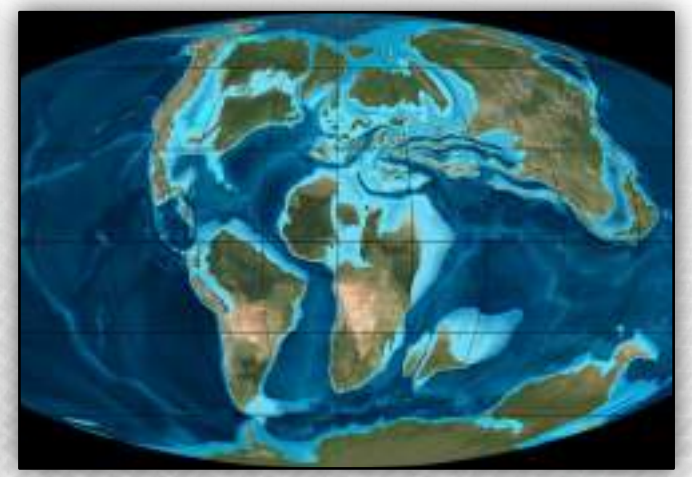
Location



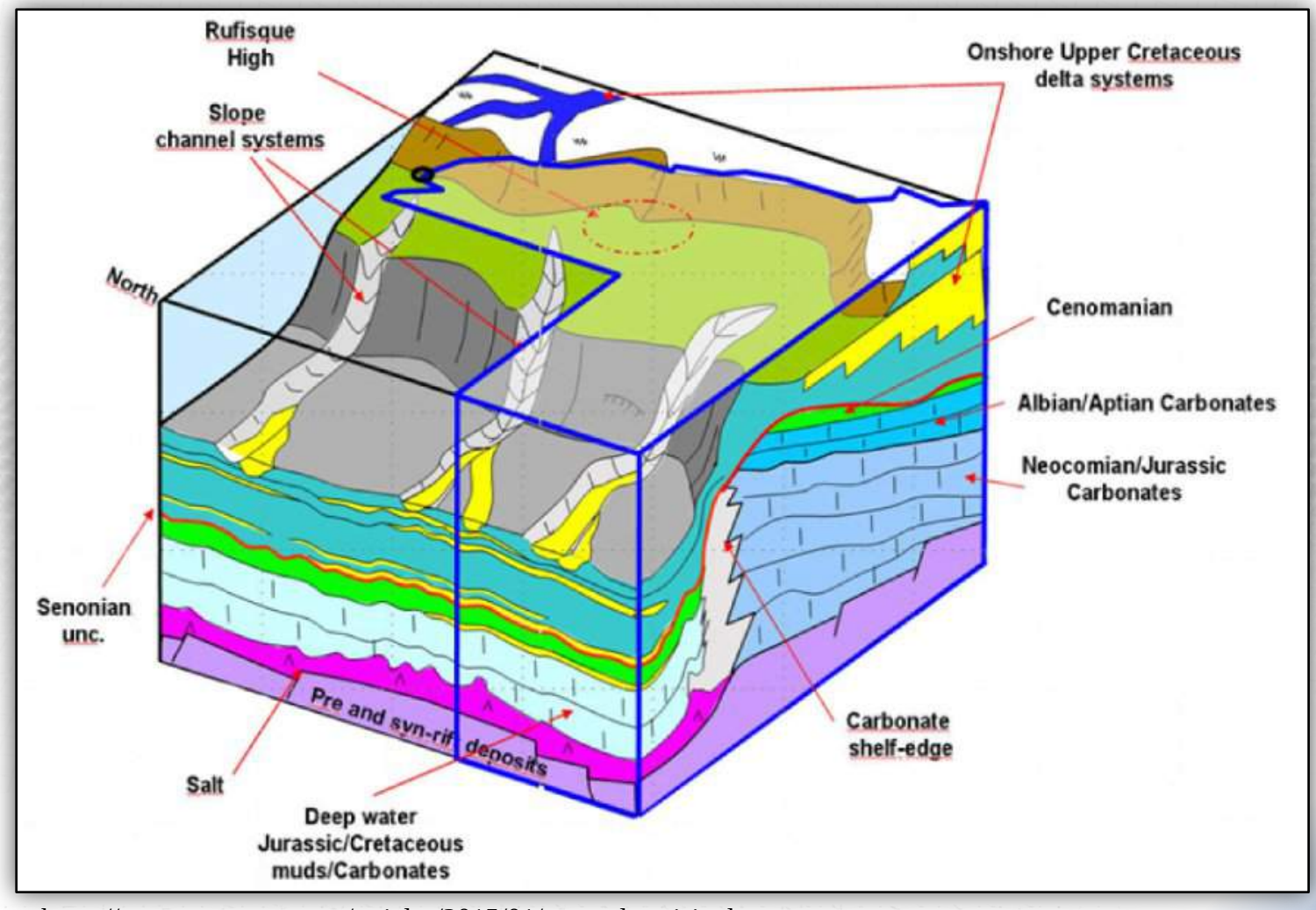


Paleogeographic reconstruction 90 Ma (http://scienceviews.com/photo/library/SIA3584.html).

"To build a regional tectonic-stratigraphic framework, integrating well data from across Senegal"

https://www.geoexpro.com/articles/2015/01/senegal-revisited

Source to sink

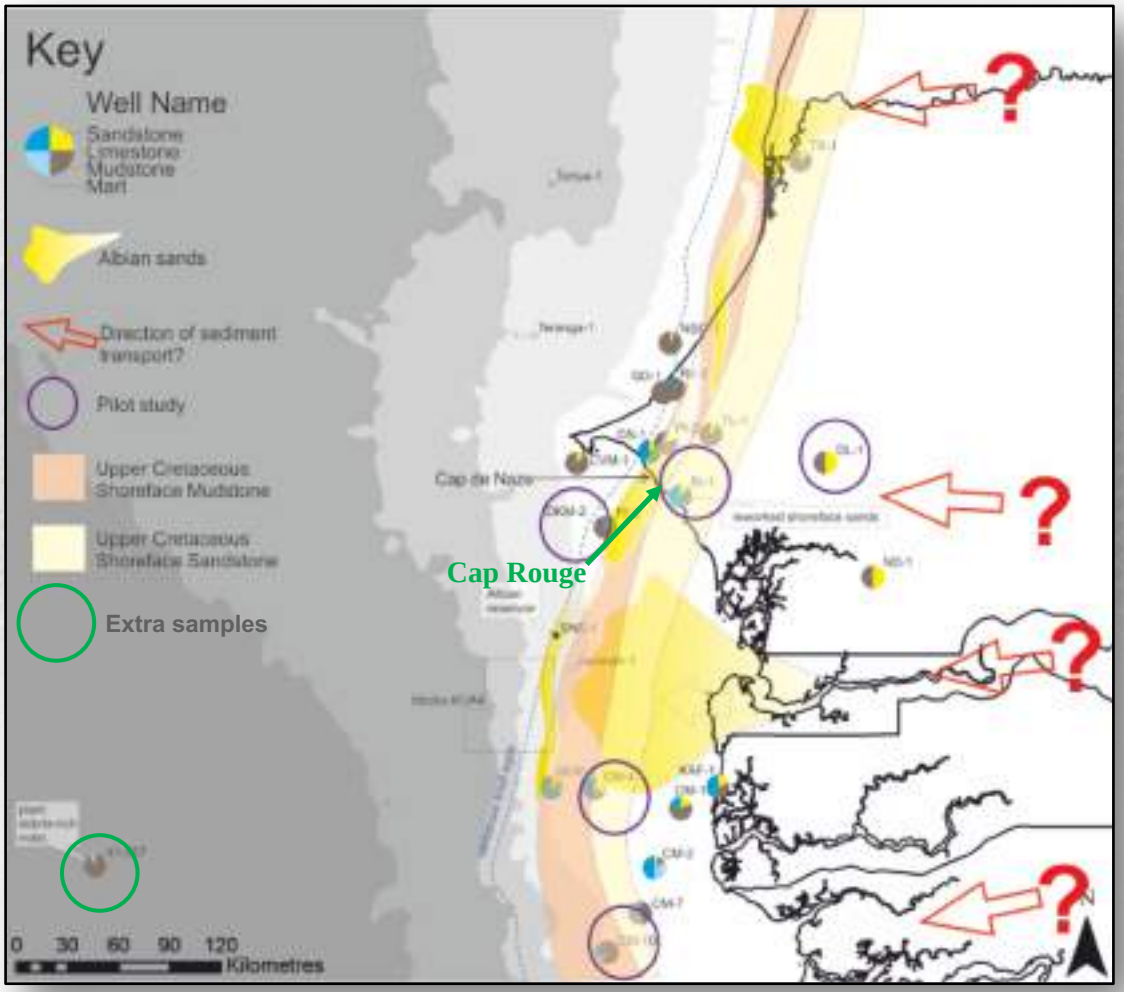


https://www.geoexpro.com/articles/2015/01/senegal-revisited

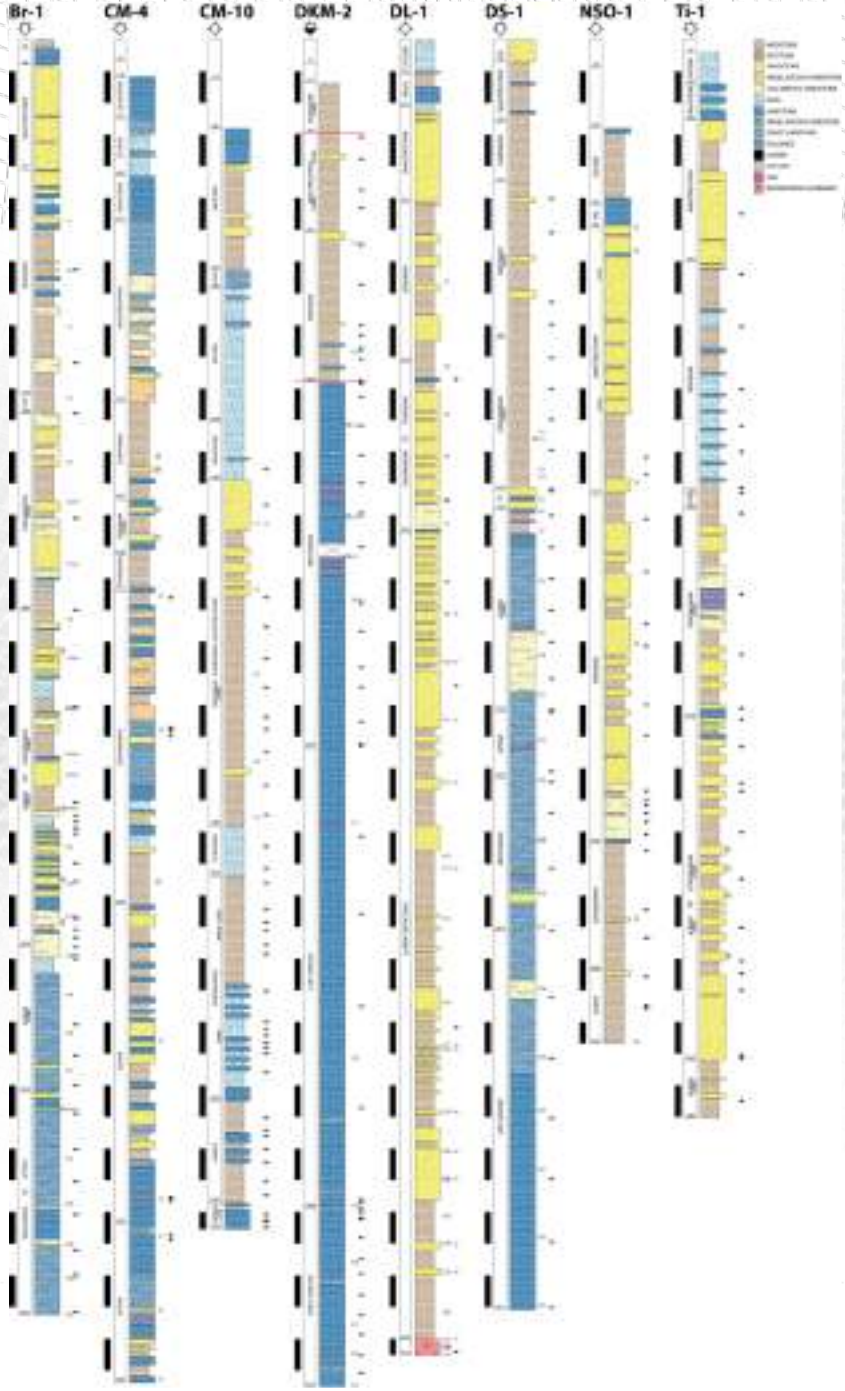
Aims

- Investigate sediment distribution in offshore and onshore basins, Senegal, NW Africa.
- Evaluate the Cretaceous stratigraphy and refine our prediction of sand delivery.
- *Examine and contrast modern-day sand delivery.

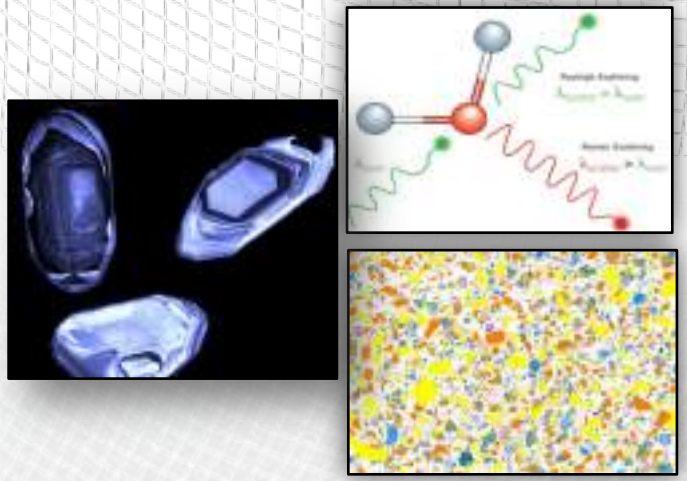
First stage sampling

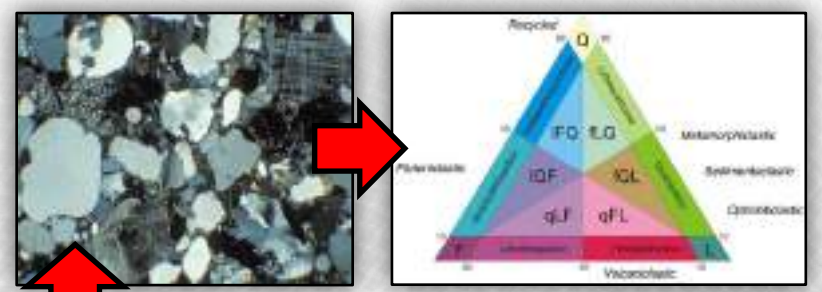


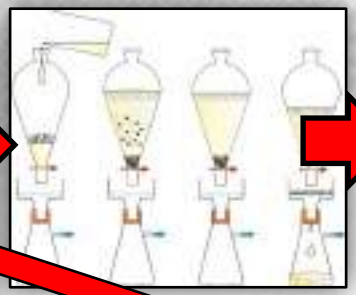
Albian (113-100 Ma) sands and Upper Cretaceous shoreface facies.
(Max Casson, PhD & Bonilla Andrango, MSc).

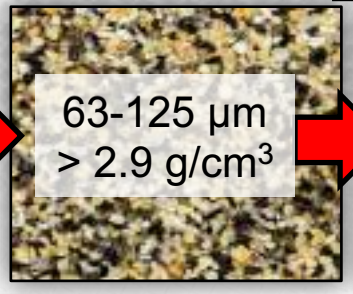


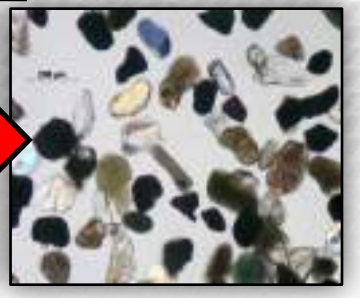
Methods

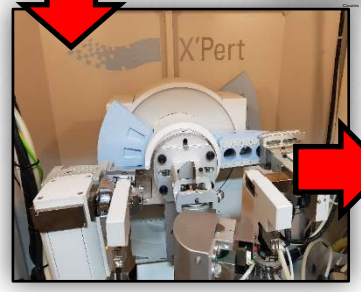


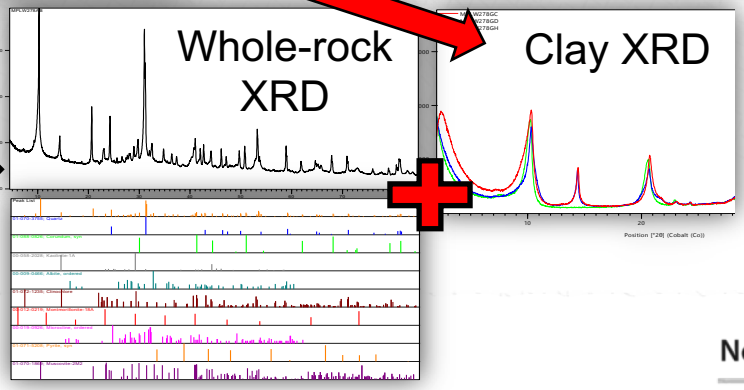












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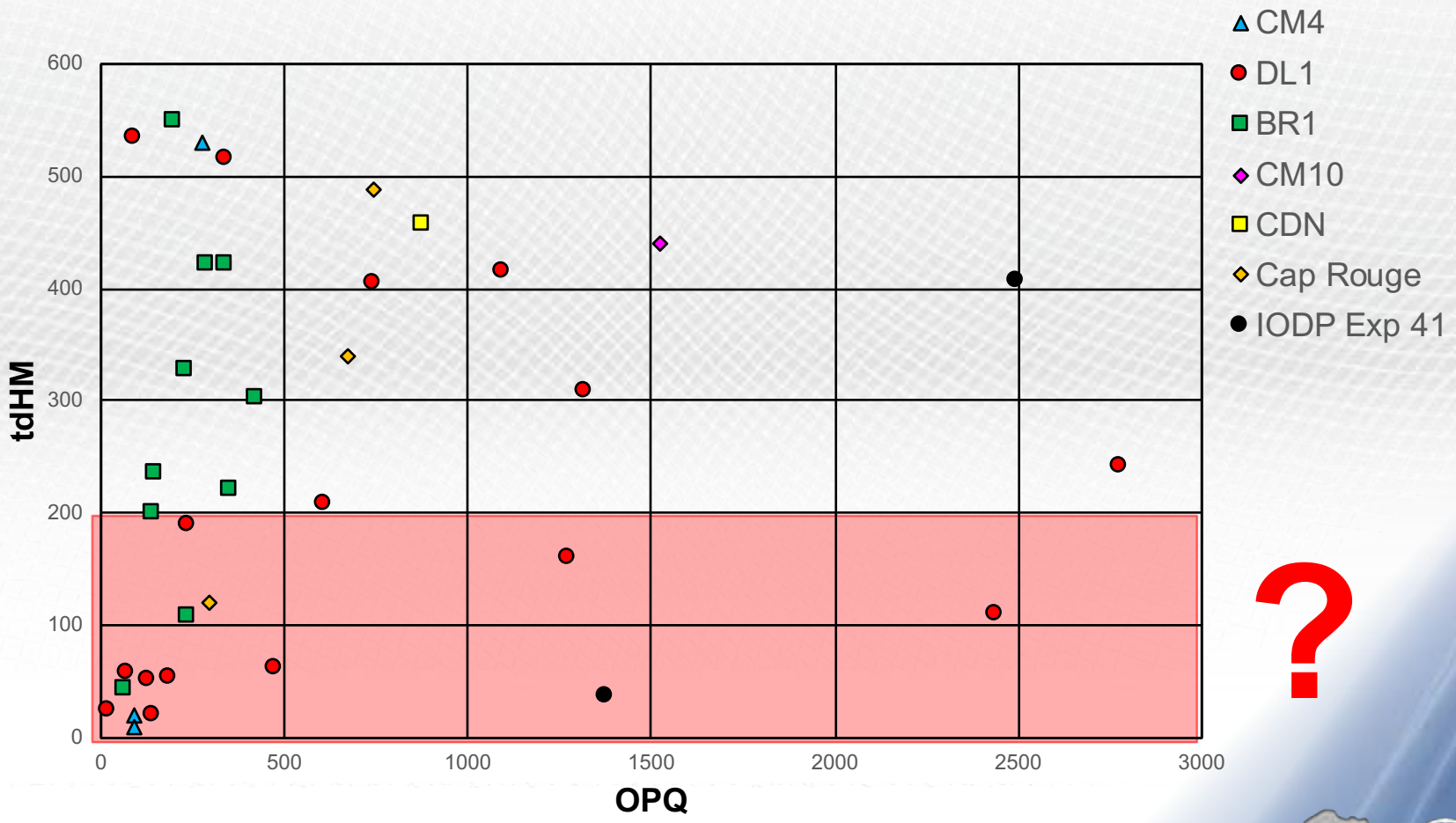
Statistical identification of *td*HM



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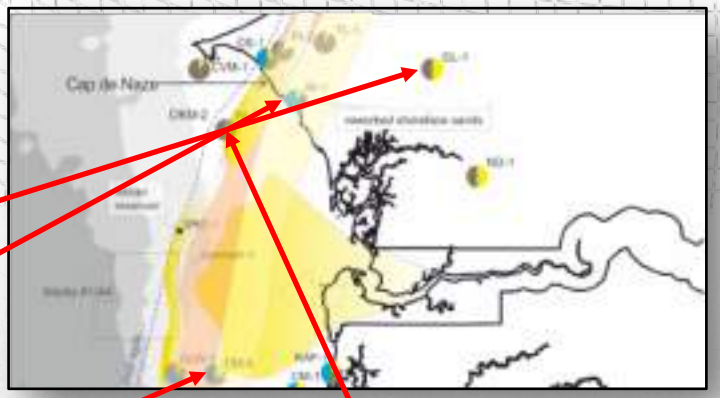
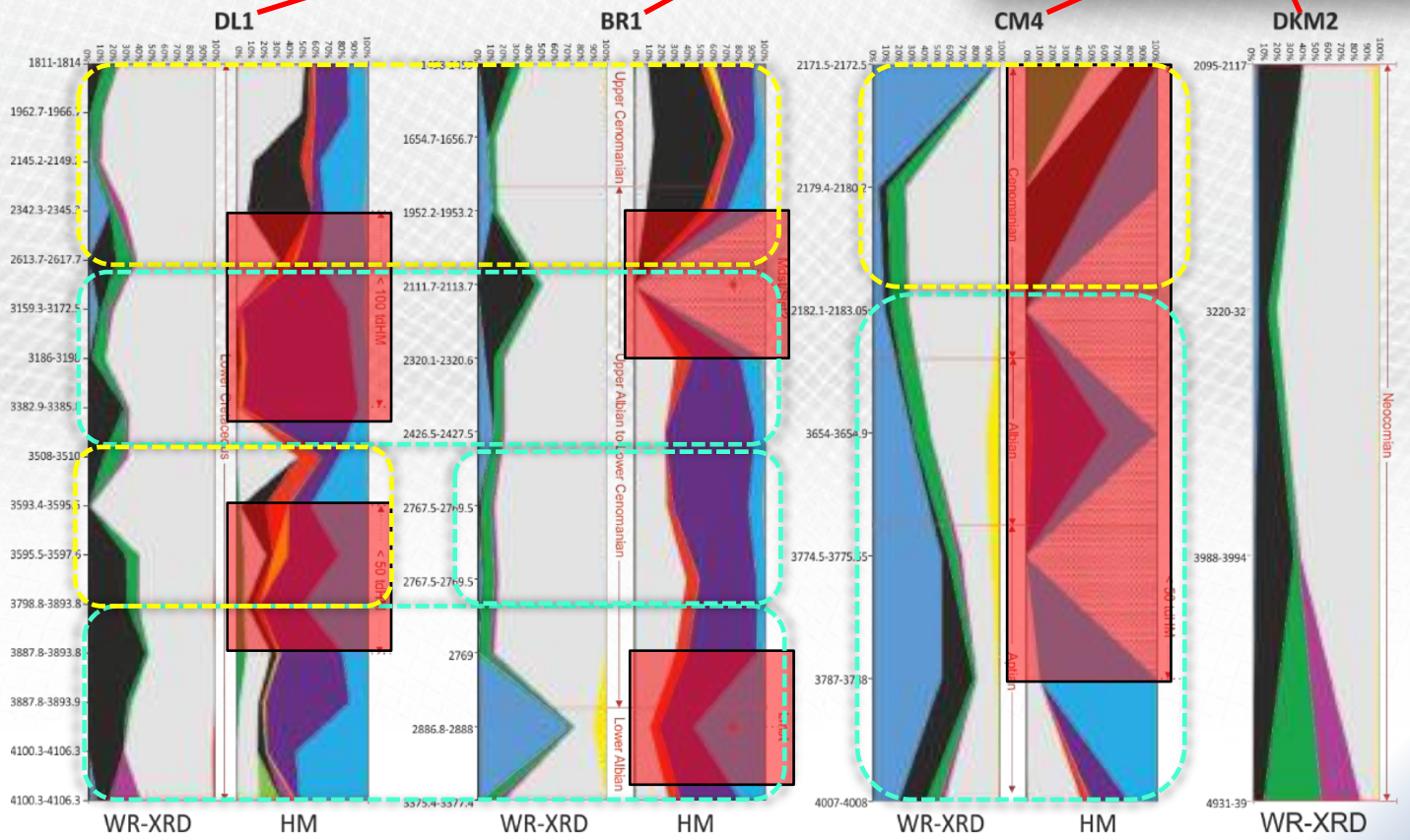
Preliminary results





HM

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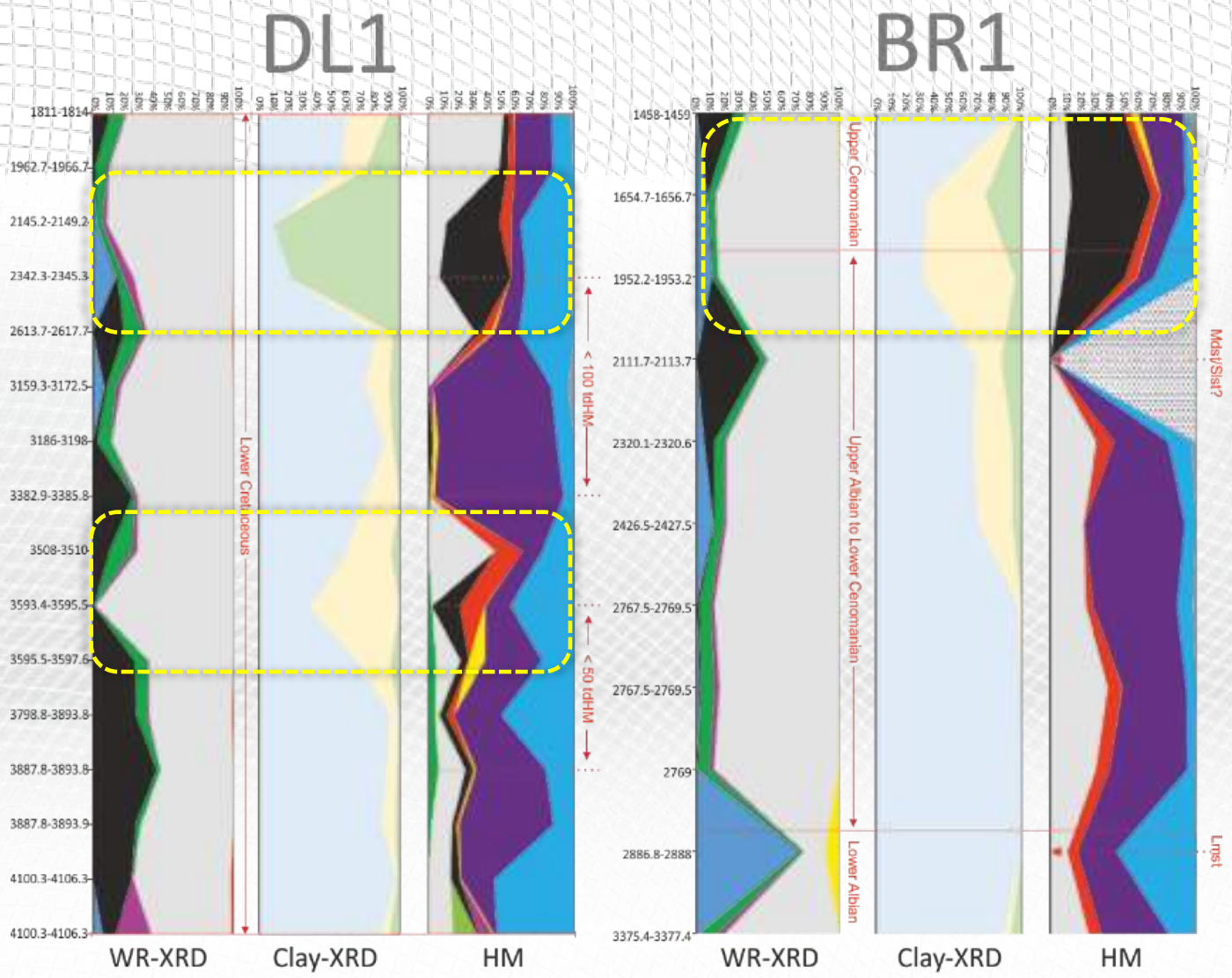

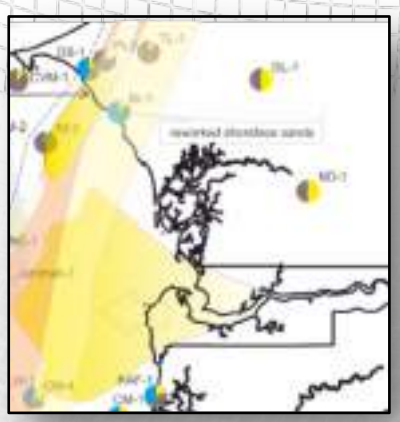

Whole-rock XRD
Carbonate Clay Feldspar
K-feldspar Quartz
Sulphides Fe-Oxides

<2 µm Clay XRD
Illite Kaolinite
Chlorite Smectite

Heavy minerals (HM)
Am Ap Ep Grt Ky Rt St
Tur Zrn Other Non-tdHM

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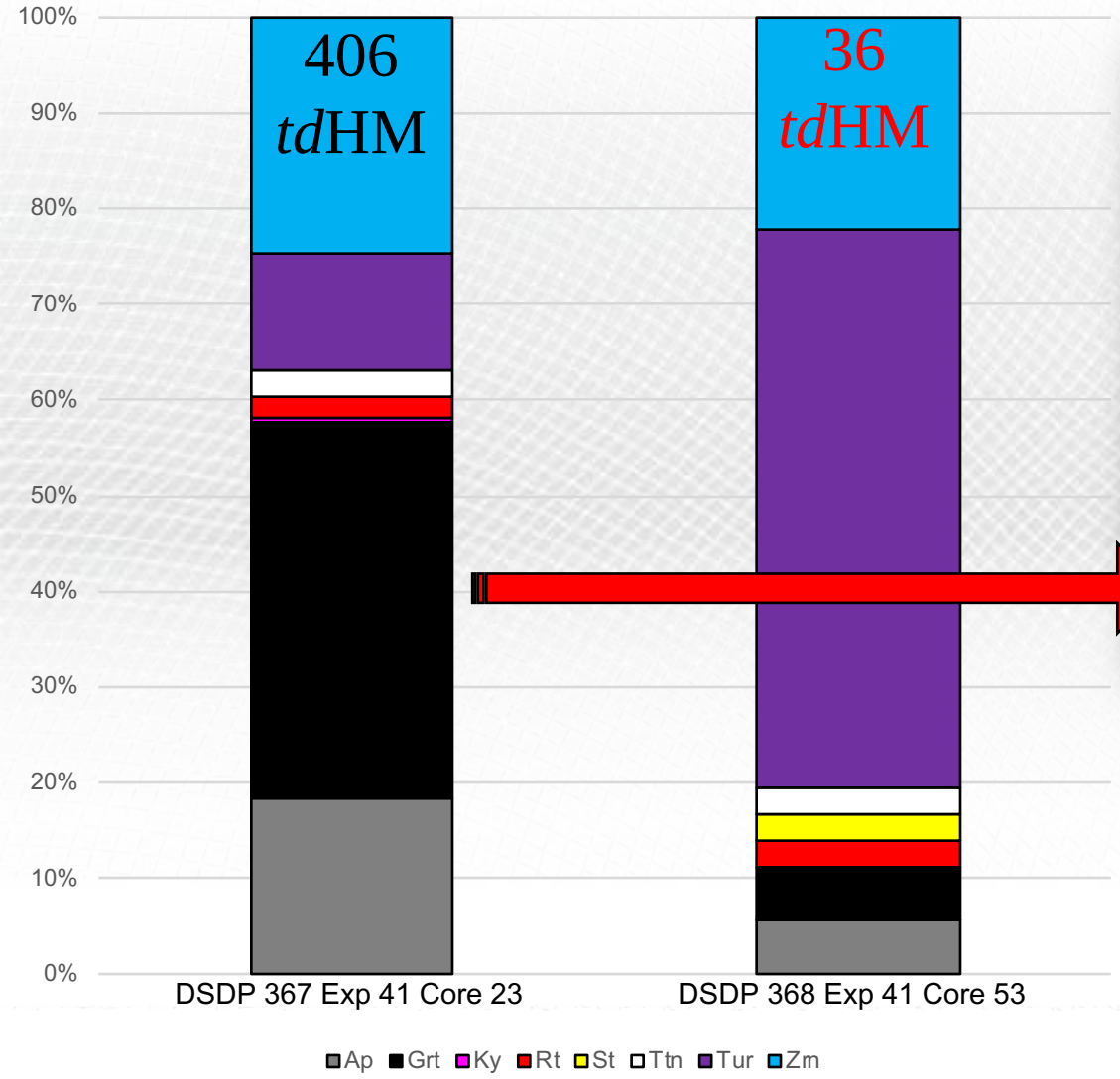
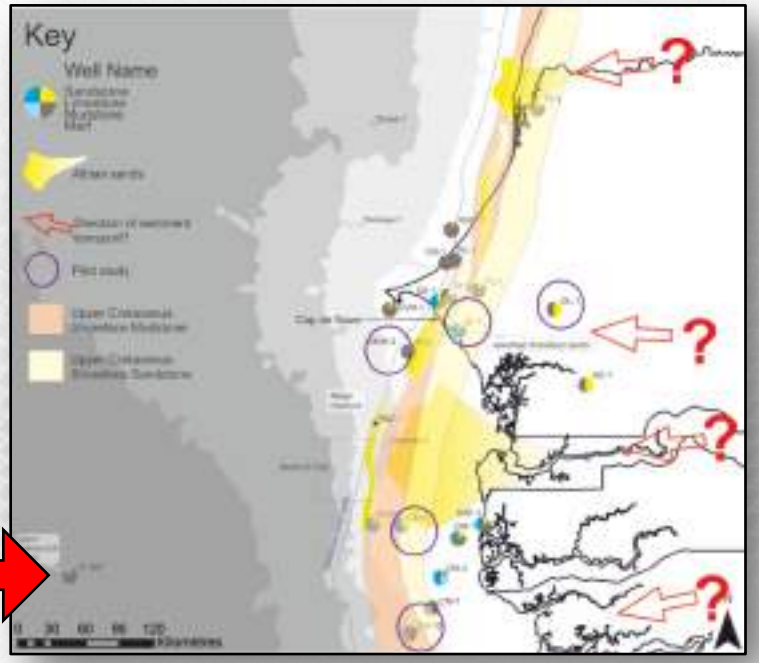
DSDP Exp 41 (367 and 368)





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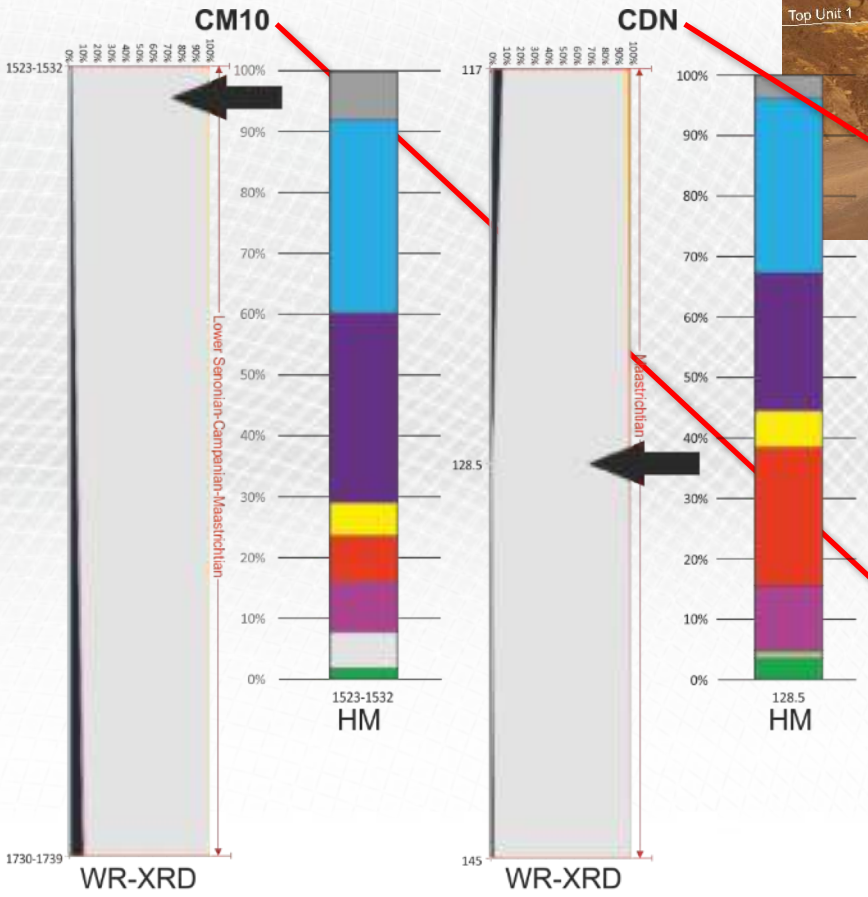
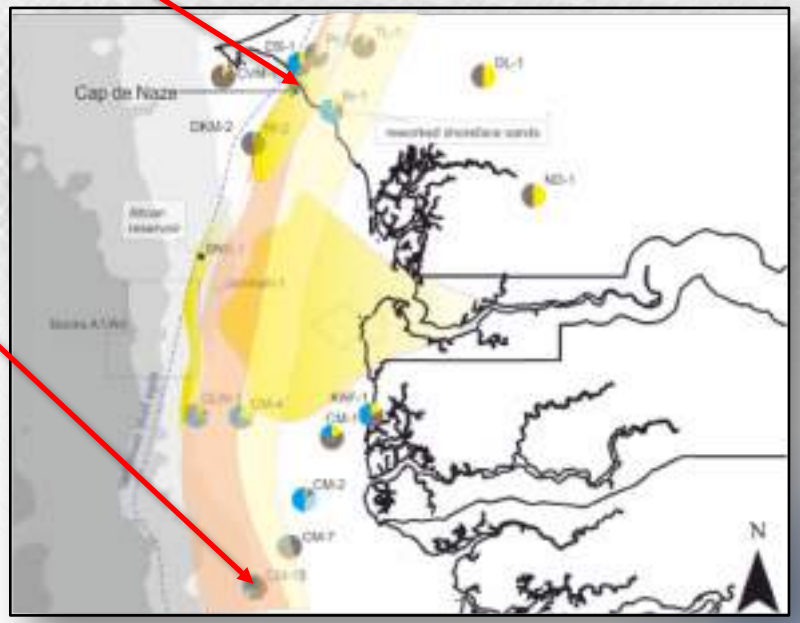
Cap de Naze





Whole-rock XRD
Carbonate Clay Feldspar K-feldspar
Quartz Sulphides Fe-Oxides

Heavy minerals (HM)
Am Ap Ep Grt Ky Rt St
Tur Zrn Other Non-tdHM

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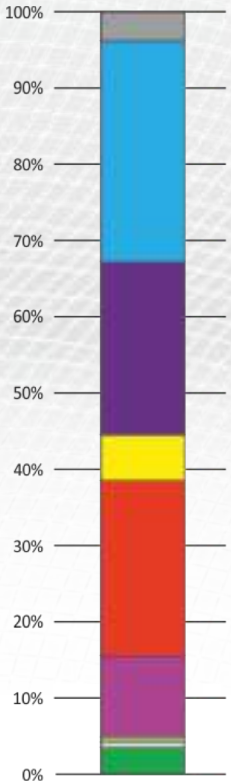
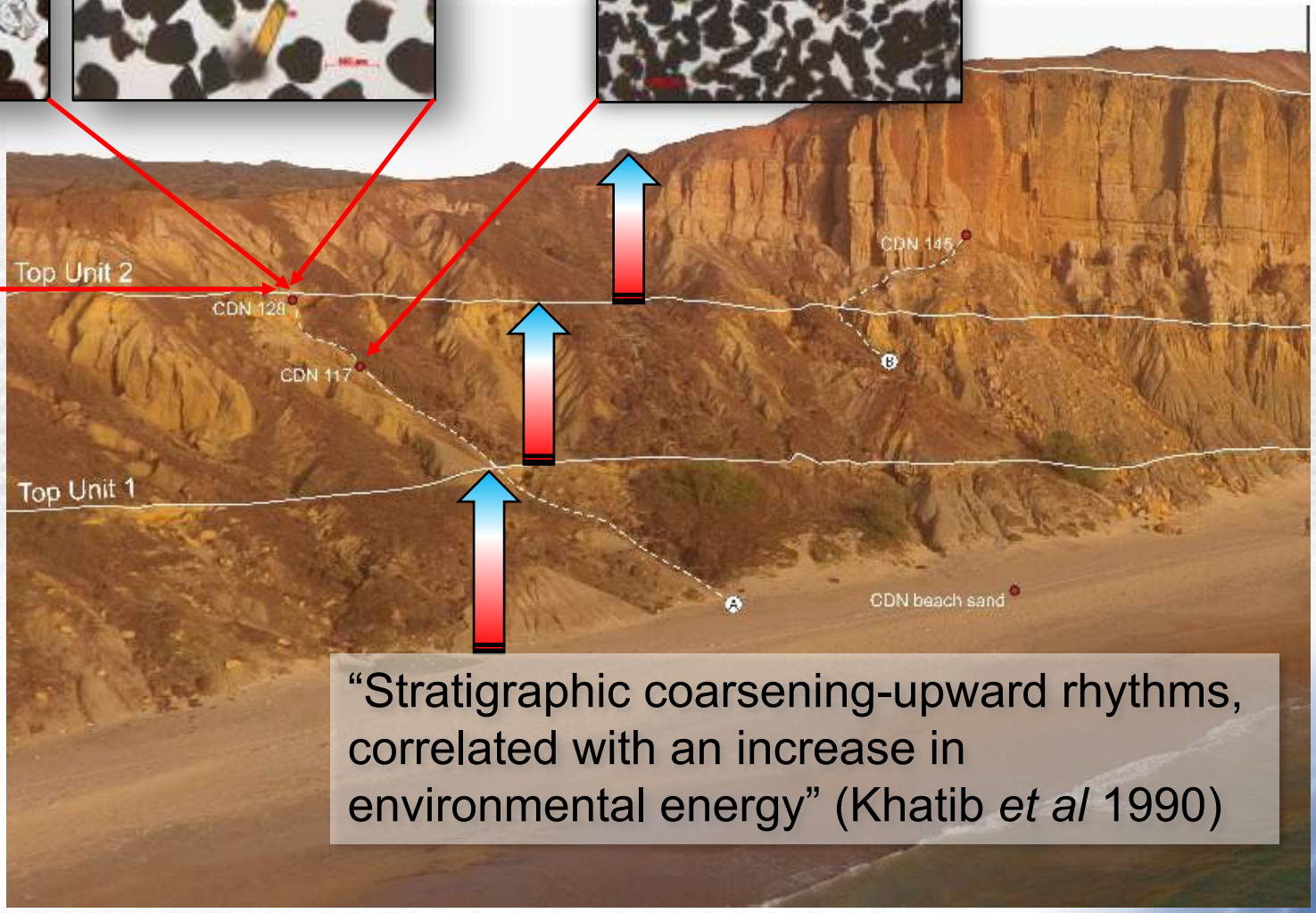


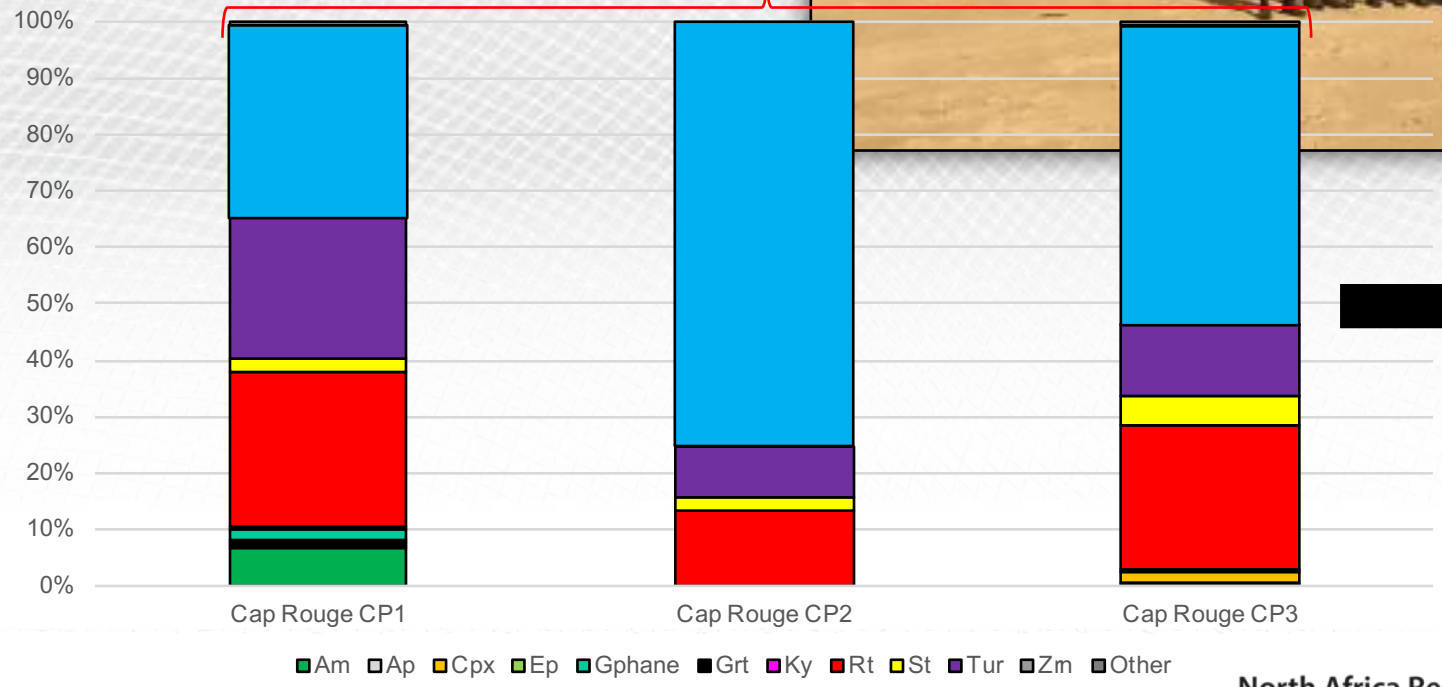


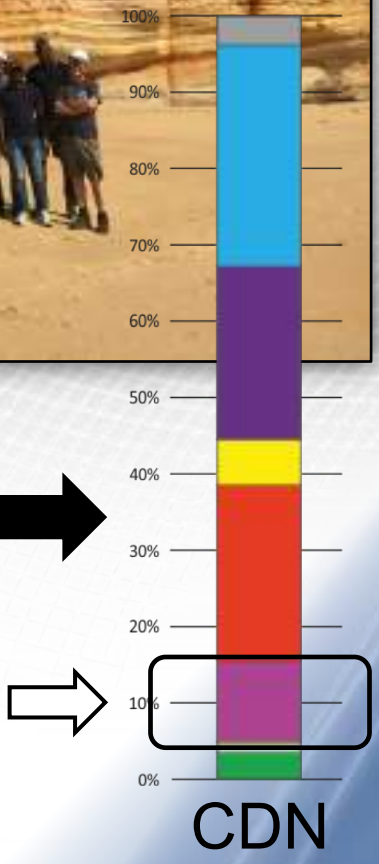
"Stratigraphic coarsening-upward rhythms, correlated with an increase in environmental energy" (Khatib *et al* 1990)

Heavy minerals (HM)

Am Ap Ep Grt Ky Rt St
Tur Zrn Other Non-tdHM

Cap Rouge





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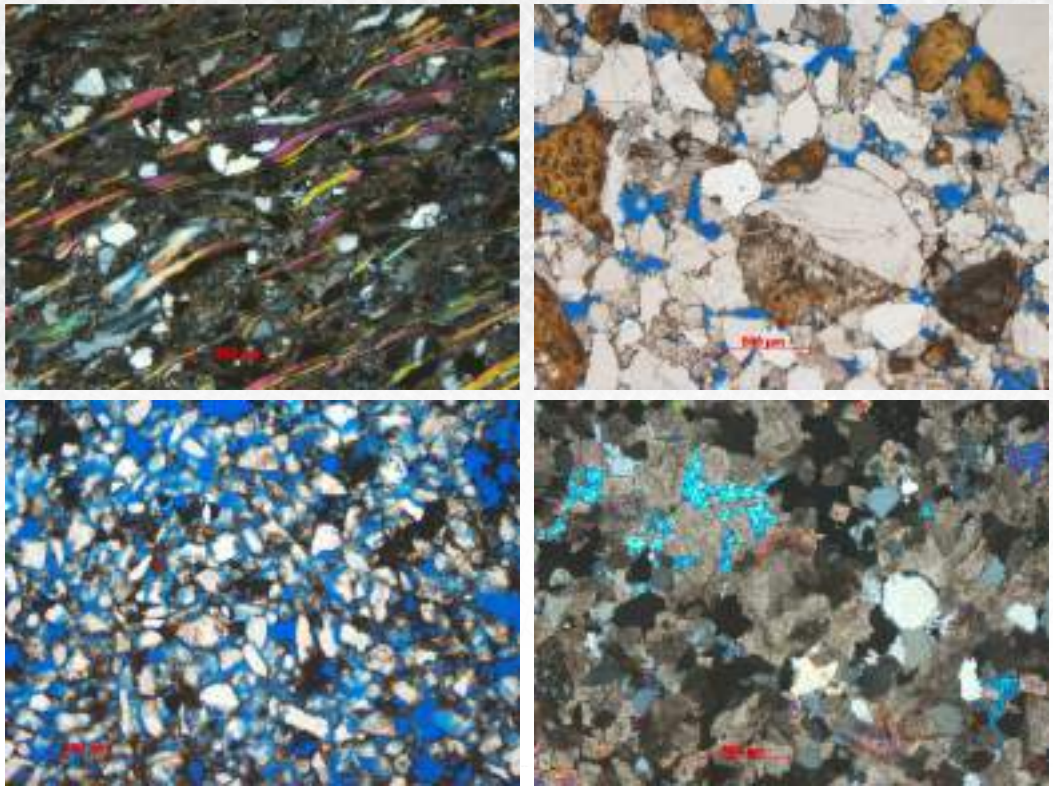
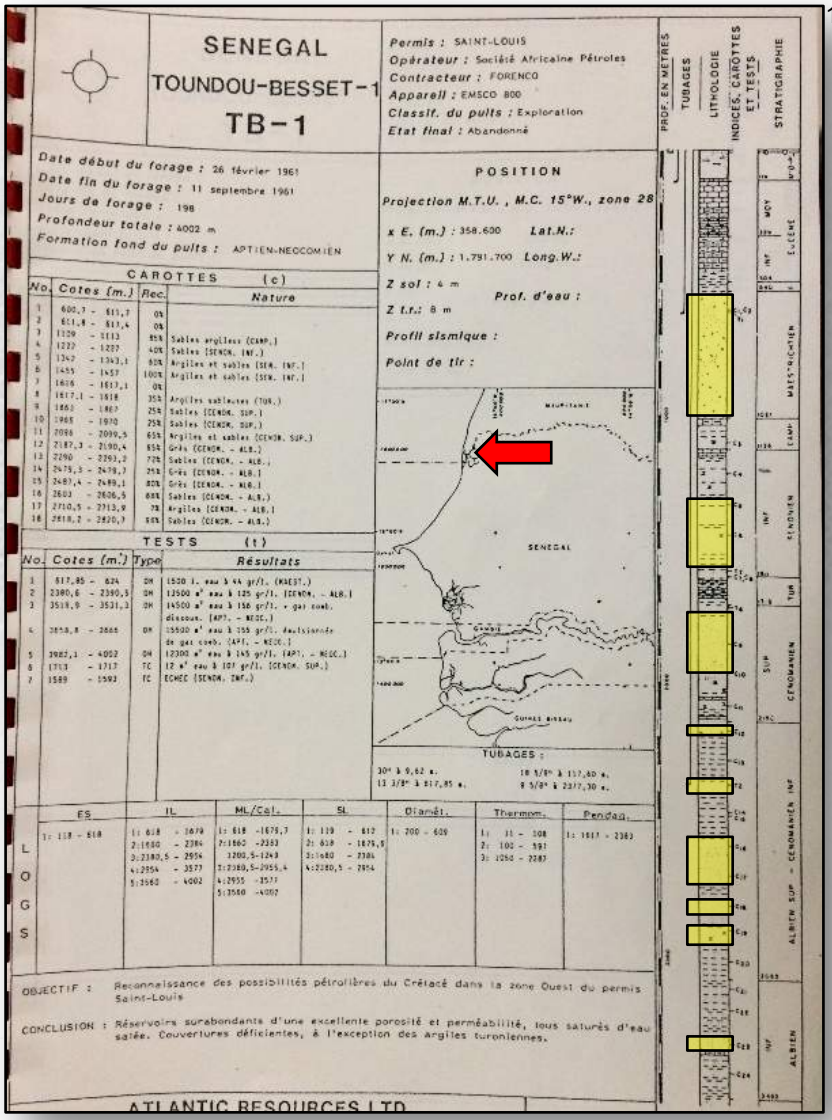
Stage one recap

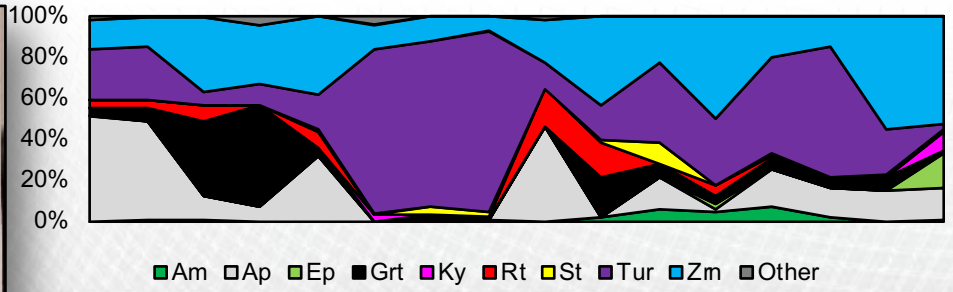
Stage 1 (to complete…):

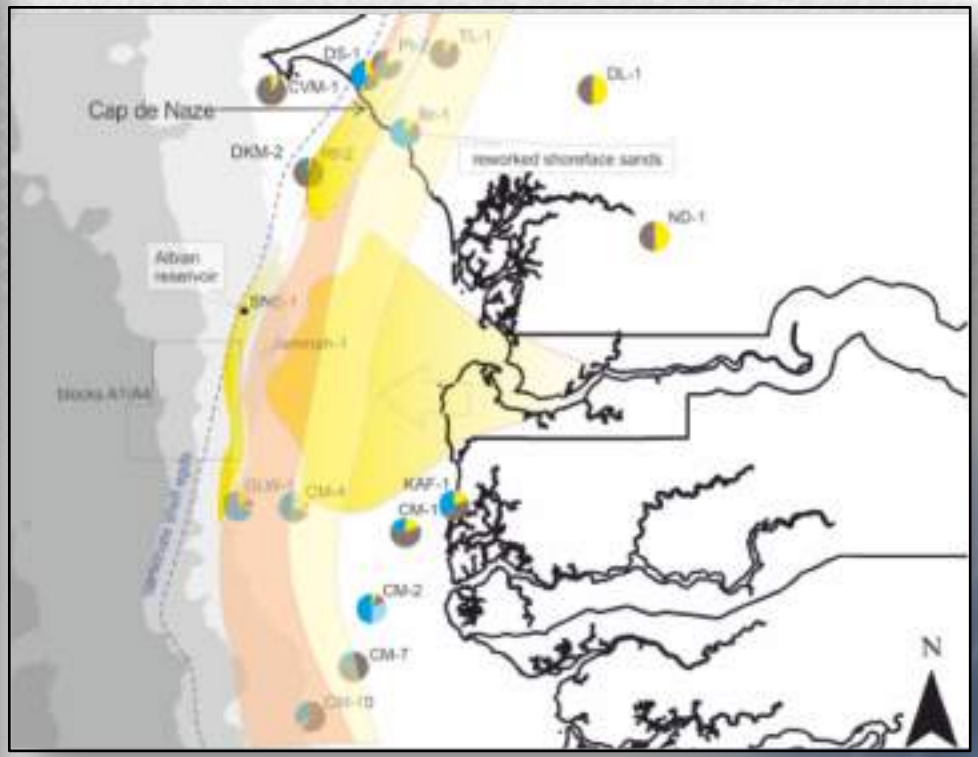
- QFL on stage 1 samples



Planning ahead







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Further sampling

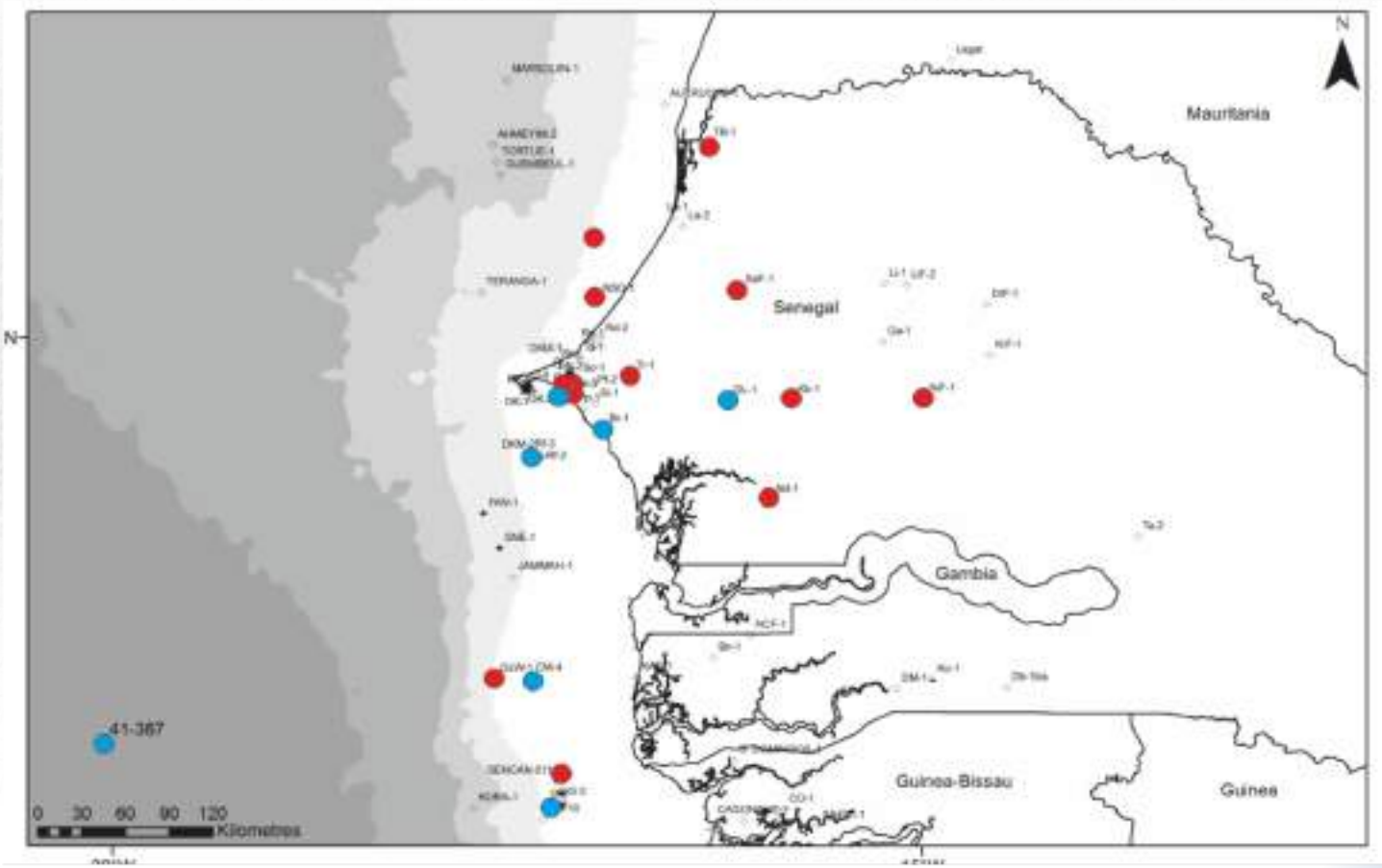
Nd-1	NiF-1	NSO-1	SaF-1	TB-1	Co-1	DS-1	CM-7	DN-2	TI-1	Si-1	Kb-1	GLW-1
Depths	Depths	Depths	Depths	Depths	Depths	Depths	Depths	Depths	Depths	Depths	Depths	Depths
310-370	300-395	750	320-390	600-700	850-850	0-65	250-400	250-310	258-300	0-230	0-48	2230
430-500	410-460	850	490-510	800-850	900-1010	1420-1440	1100-1190	360-420	420-710	230-520	217-437	
600-680	500-600	1250	600-660	900-950	1200-1300	1830-2020	1400-1420	700-800	1530-1610	520-730	600-700	
740-810	675-700	1520-1600	810-880	1330-1400	1500-1515	2690-2710	1710-1730	1300-1400	1960-2030	730-884	860-960	
1050-1110		1820-1900	1080-1120	1450-1500	1550-1585	2930-3000	2120-2135		2220-2260		1100-1180	
1150-1200		2250-2310	1240-1300	1800-1900	~1810		2210-2230		2600-2710		1400	
1603-1640			1320-1400	2130-2190	2000-2150				2800-2920		1600-1640	
1950-2040			1630-1700	2350-2400	2300-2330				3270-3330		1940-2030	
2300-2330				2600-2650	2590-2630						2300	
2800-2865				2700-2750	2850-2920							
3120-3160				2800-2860								
				2900-2950								
				3290-3310								

Key

- Miocene
- Eocene
- Paleocene
- Maastrichtian
- Campanian
- Senonian
- Turonian
- Cenomanian
- Albian
- Aptian
- Neocomian
- Jurrasic

Unspecified Cretaceous

Sampling locations



Stage 1 sampling

Stage 2 sampling

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WITH THANKS

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