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Discussion of the Mapping of Basement Depth in the Kavango Basin, Namibia Using High-Resolution Magnetic Data

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MAGNETIC SUSCEPTABILITIES (Magnetic Mineral Content) OF ROCKS

Type	Susceptibility Range x 10^6 emu	Average
Sedimentary		
Dolomite	0-75	10
Limestones	2-280	25
Sandstones	0-1660	30
Shales	5-1480	50
Av. Var. Sed. (48)	0-4000	75
Metamorphic		
Amphibolite		200
Schist	25-240	220
Phyllite		200
Gneiss	10-2000	800
Quartzite		350
Serpentine	250-1400	900
Slate	0-3000	500
Av. Var. Met. **(61)**	0-5800	350

Type	Susceptibility Range x 10^6 emu	Average
Igneous		
Granite	0-4000	1000
Rhyolite	20-3000	
Dolerite	100-3000	1400
Augite-Syenite	2700-3600	
Olivine-Diabase		2000
Diabase	80-13000	4500
Porphyry	20-16700	5000
Gabbro	80-7200	6000
Basalts	20-14500	6000
Diorite	50-10000	7000
Pyroxenite		10500
Peridotite	7600-15600	13000
Andesite		13500
Av acid Ign.	3-6530	650
Av. basic Ign.	44-9710	2600

IGNEOUS & METAMORPHIC ROCKS MUCH HIGHER SUSCEPTIBILITY (MAGNETIC MINERAL CONTENT) THAN SEDIMENTARY ROCKS

MAGNETIC DATA IDEAL FOR MAPPING BASEMENT

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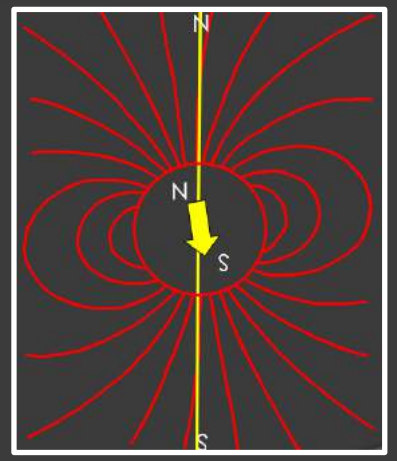

Lateral Concentration of Magnetic Minerals Produces Magnetic Anomalies , i.e. Basement Structures

MEASURES VERY SMALL DIFFERENCES IN MAGNETIC FIELD = MAGNETIC CONCENTRATIONS DIFFERENCES

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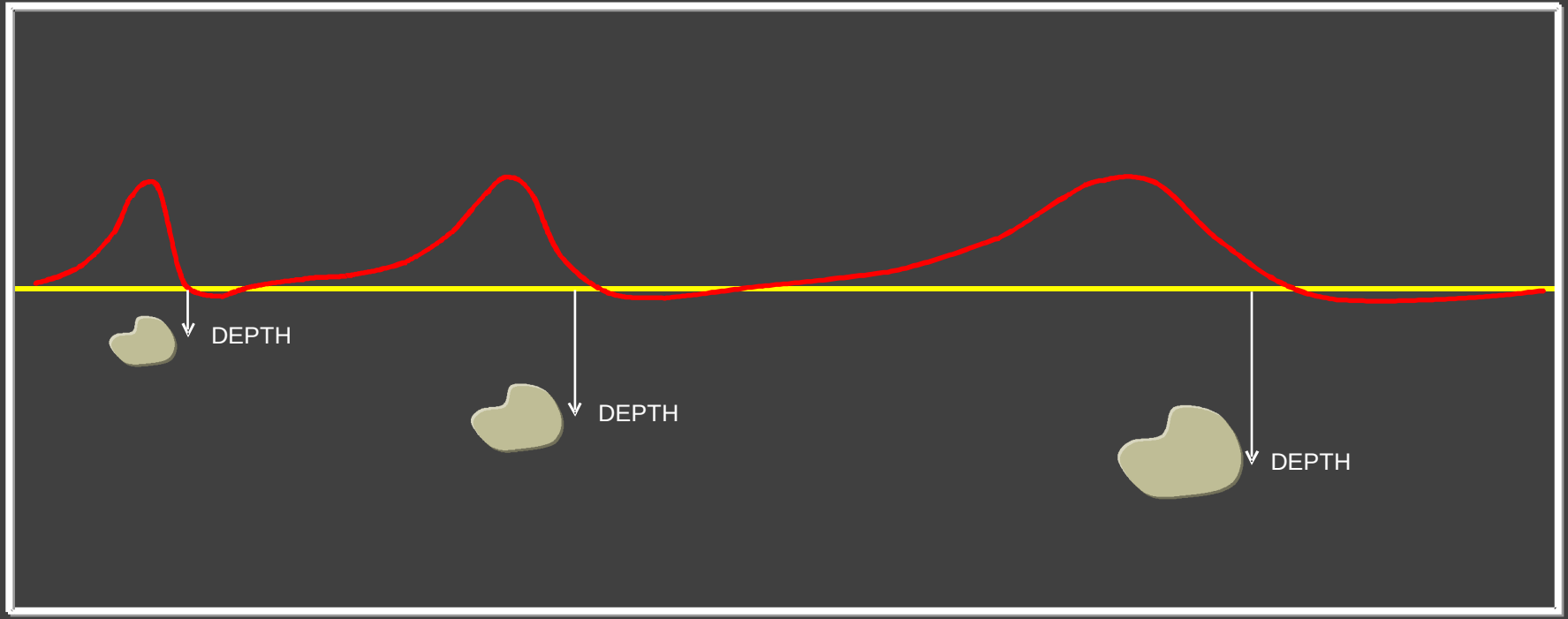
BASEMENT DEPTH CAN BE DETERMINED BY MAGNETIC ANOMALY WAVELENGTHS



SHALLOW BASEMENT PRODUCES SHORT WAVELEGTH MAGNETIC ANOMALIES
DEEP BASEMENT PRODUCES LONG WAVELENGTH MAGNETIC ANOMALIES

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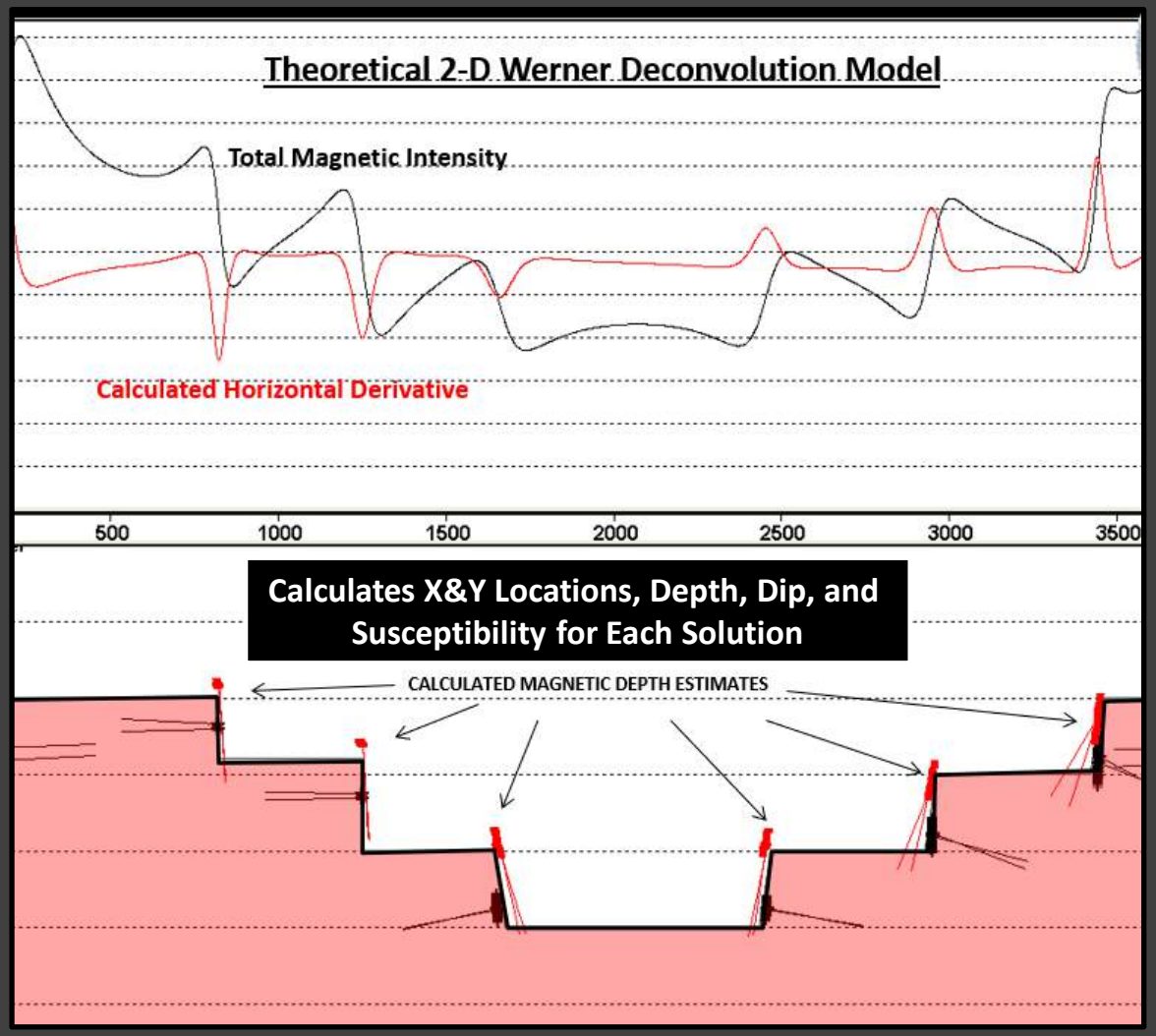
Theoretical Magnetic Data Werner Deconvolution Profile



Very Well Established/Respected Inverse Modelling Technique For Magnetic Depth Determination

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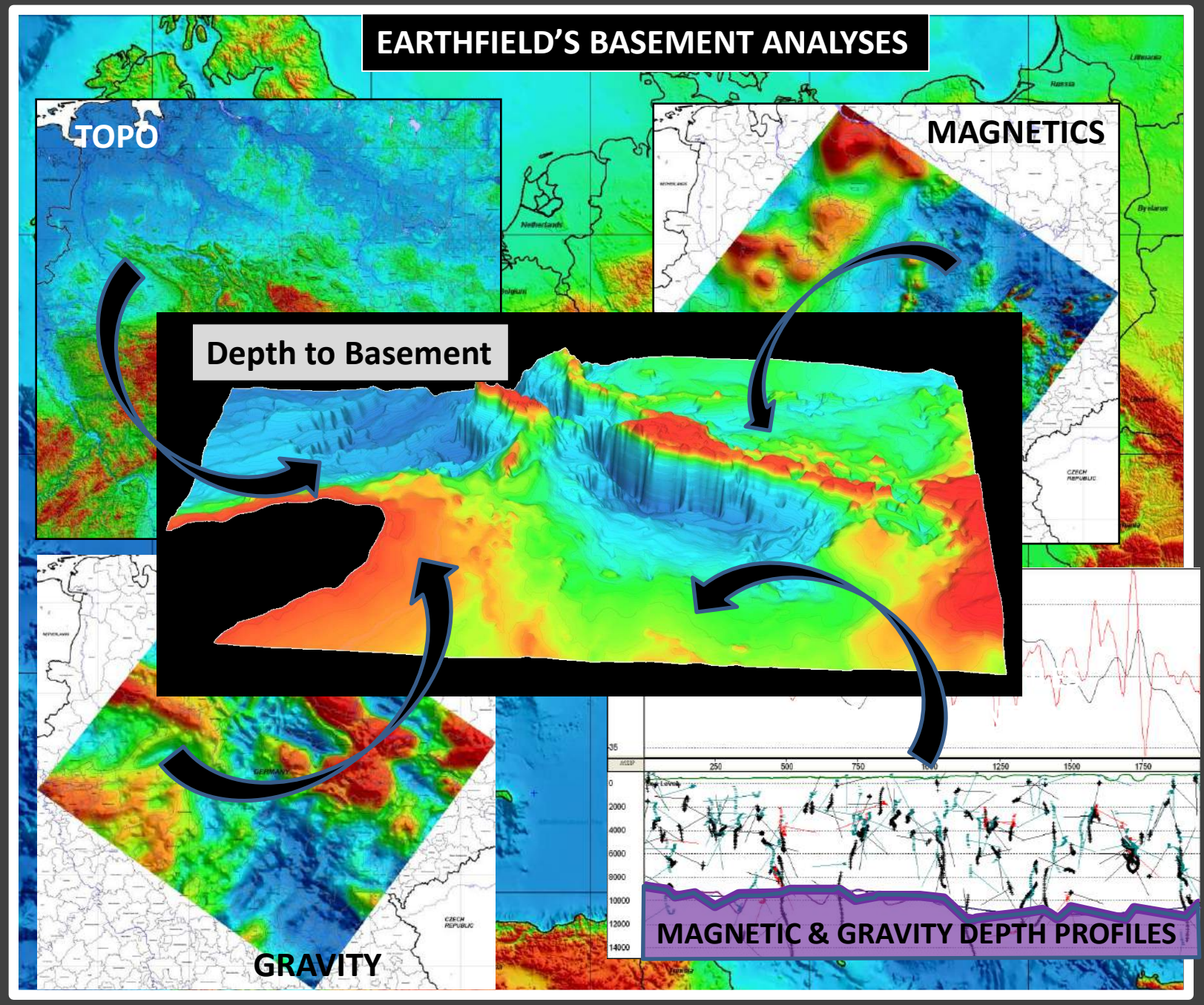

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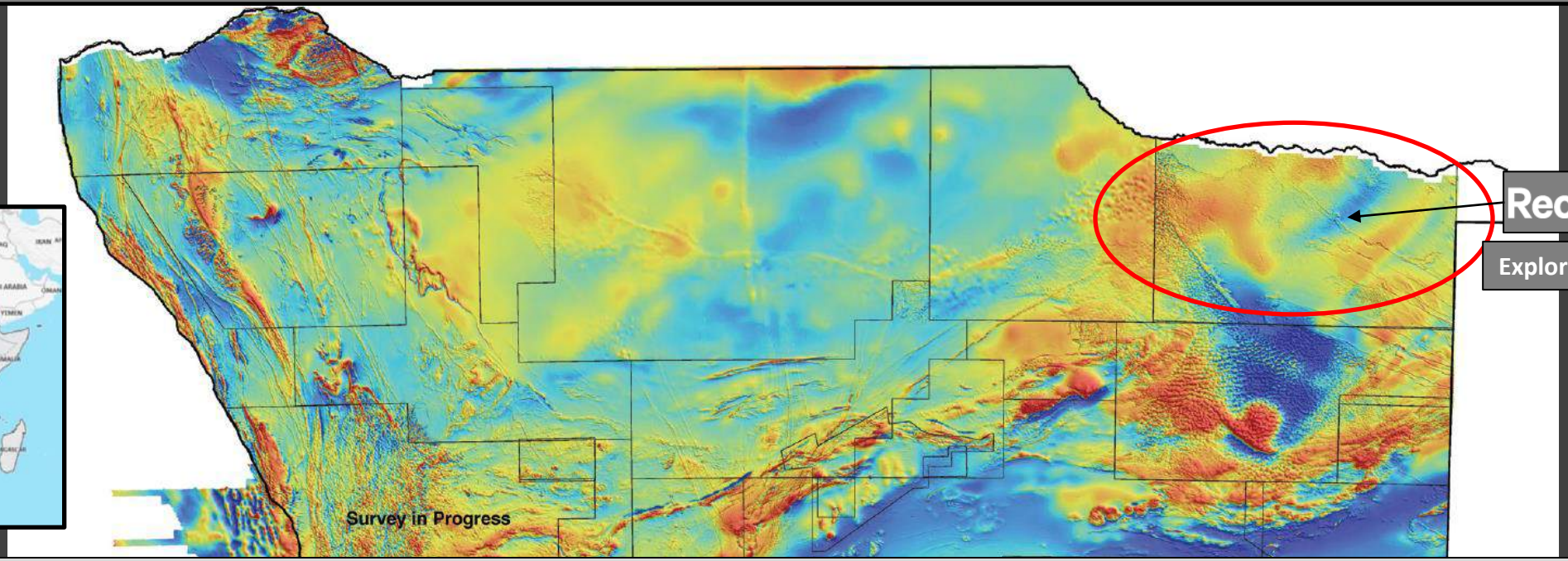
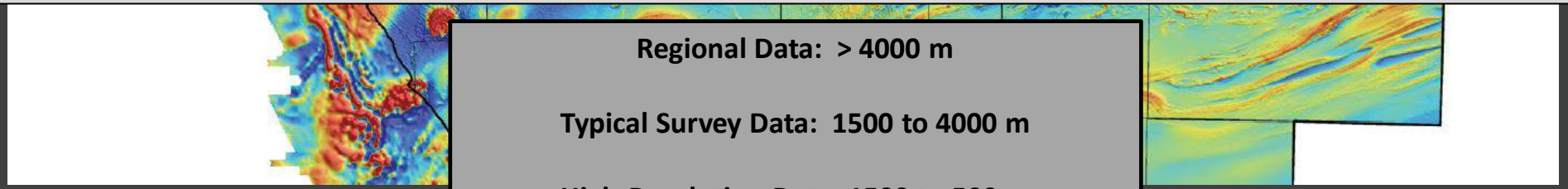
High-Resolution Namibia Magnetic Data (Profile Spacing) = 200 Meters



Typical Data Resolution Differences Between Regional & High-Resolution Magnetic Surveys (Magnetic Profile Separation)



Regional Data: > 4000 m

Typical Survey Data: 1500 to 4000 m

High-Resolution Data: 1500 to 500 m

VERY High-Resolution Data: <500 m

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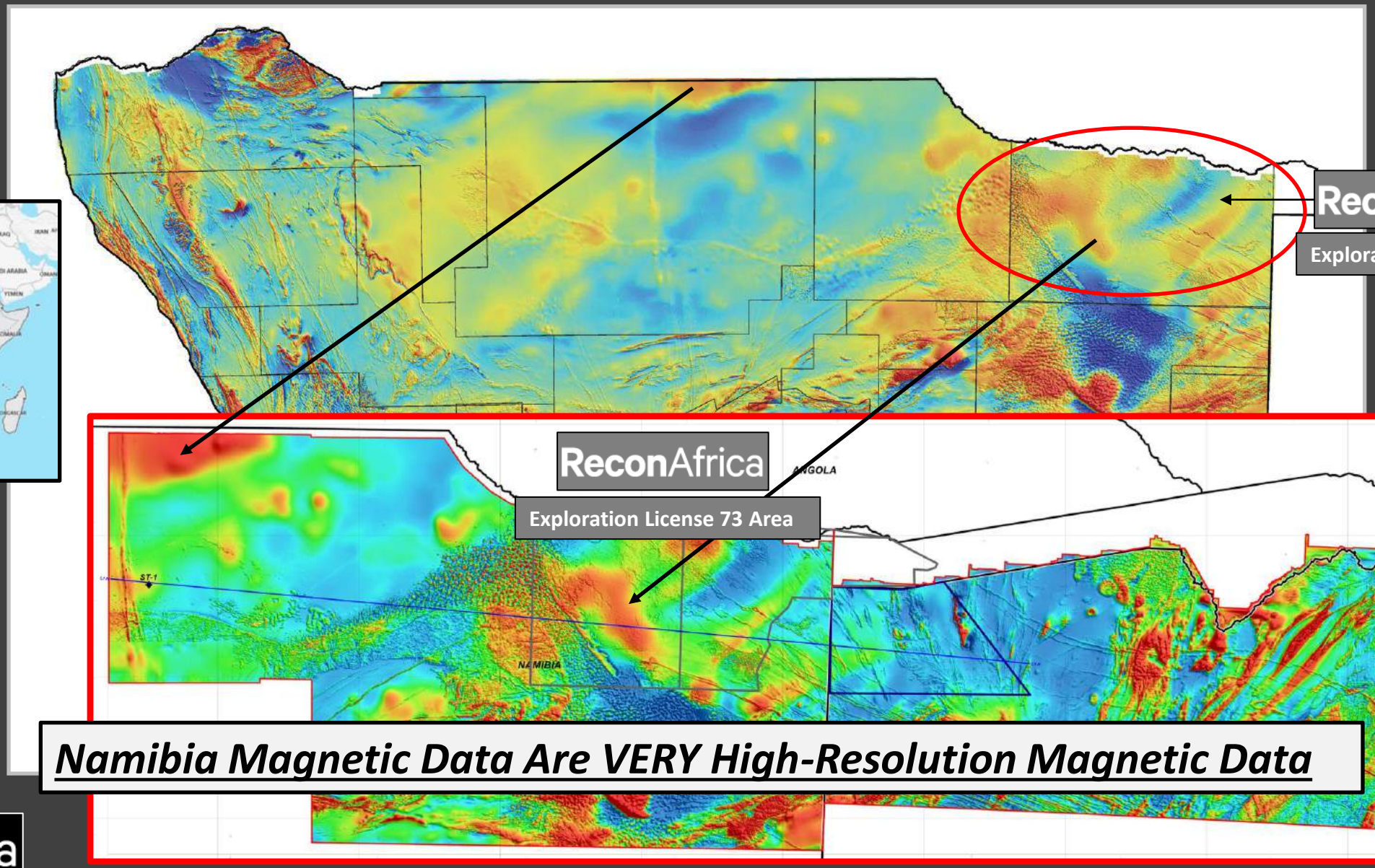

Namibia Magnetic Data Are VERY High-Resolution Magnetic Data

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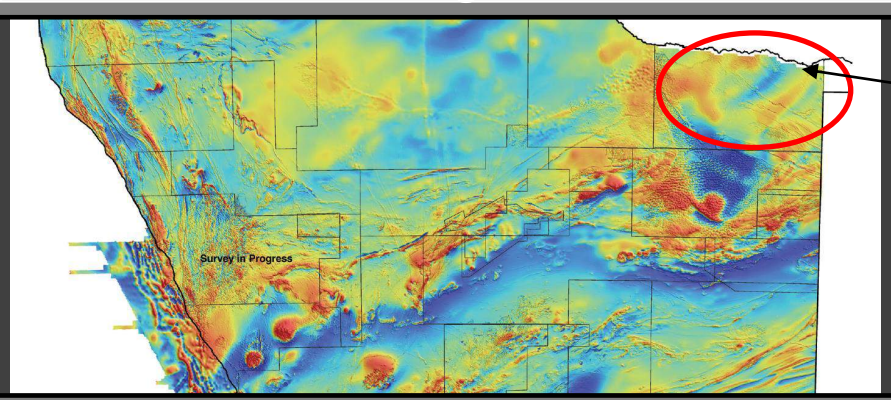
VERY High Resolution Magnetic Data Allows Detailed Basement Mapping

Very High-Resolution Namibia Magnetic Data – 200 meter spaced lines



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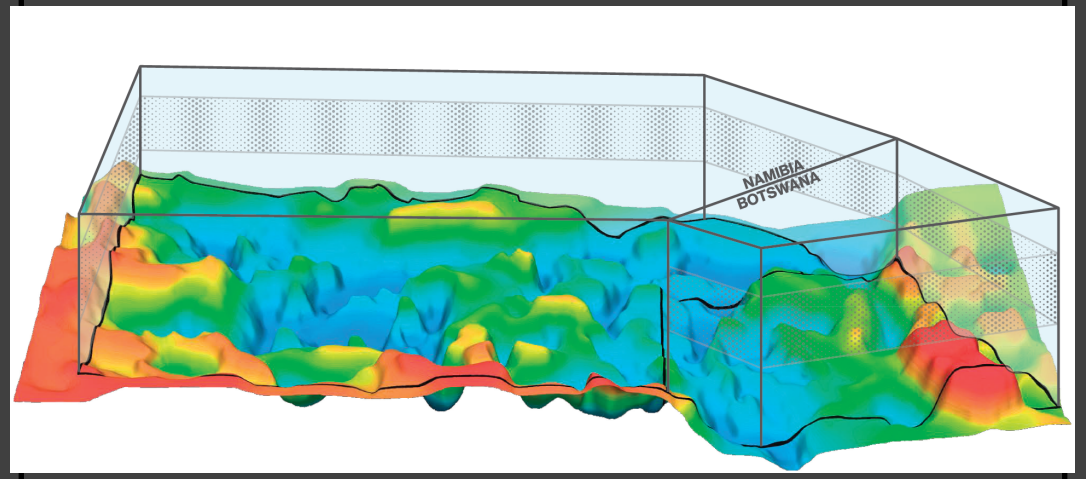
Depth to Basement from Very High-Resolution Magnetic Data



Kavango Basin
Interpreted Sedimentary
Thickness Up To 30,000'

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