

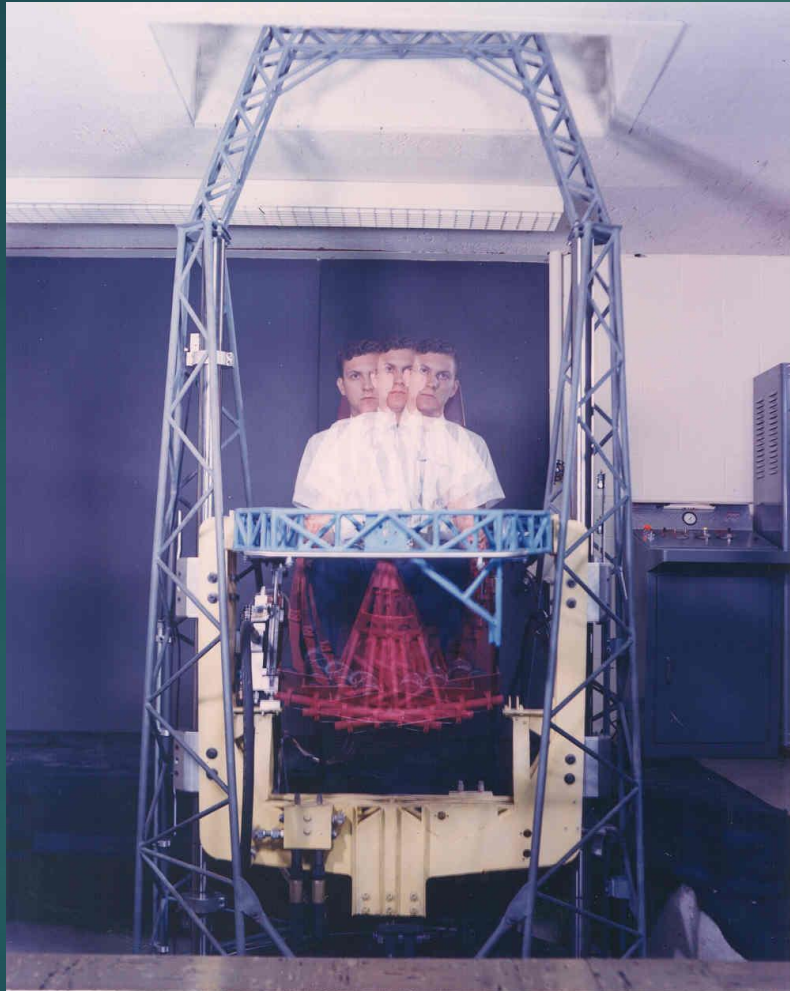
Off-Road Military Vehicle Testing and Simulation

DR. GEORGE L. MASON, PHD.

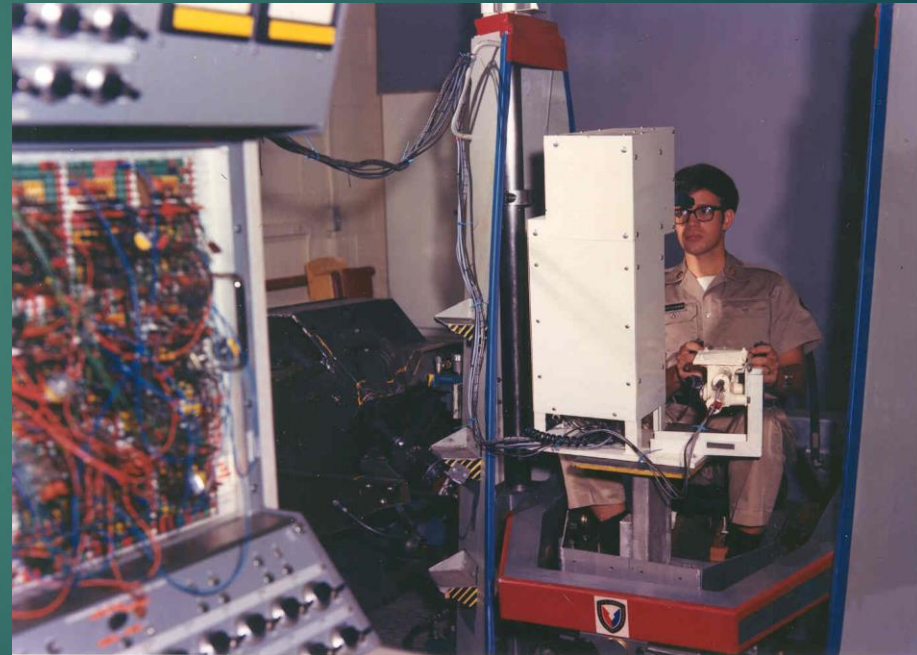




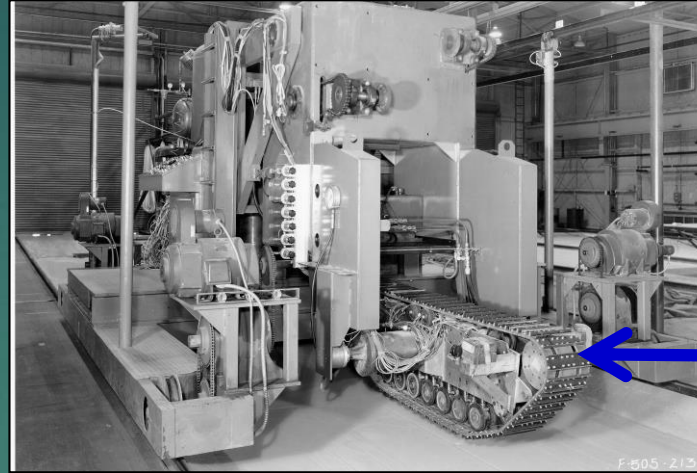
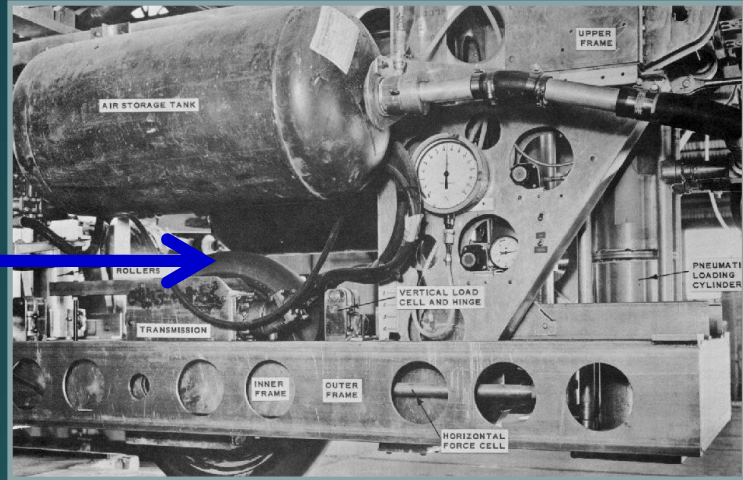
U. S. ARMY TANK - AUTOMOTIVE CENTER NEG. NO.C-PR521-64-10 DATE 29 Oct 63
Dynamic Simulation Laboratory.



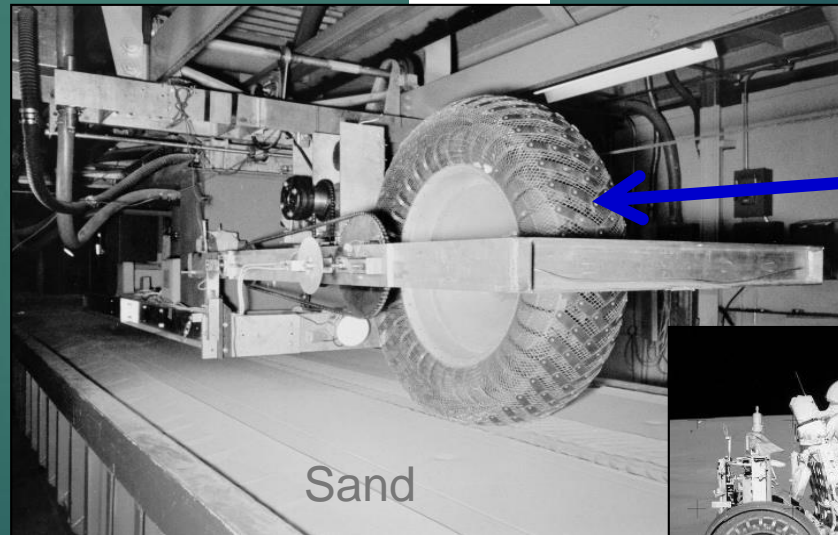
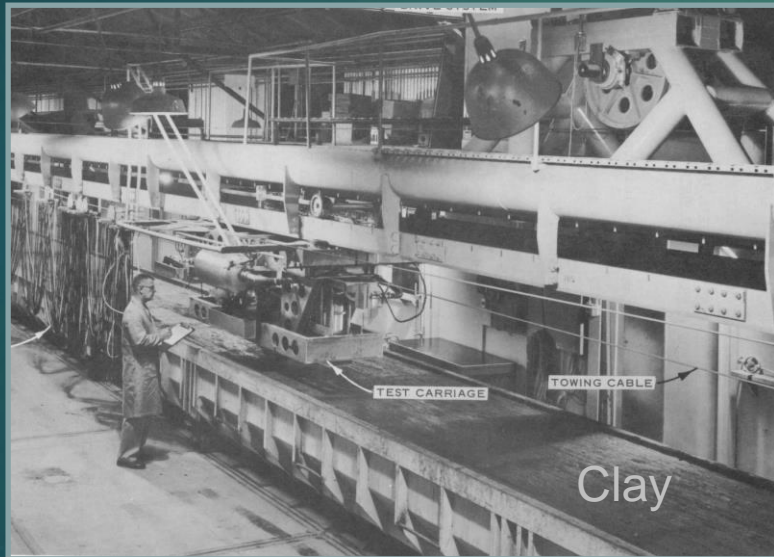
DETROIT ARSENAL **NEG. NO.** C-68218 **DATE** 1 Feb 62
Dynamic Simulations Laboratory Drivers Seat Action Test.



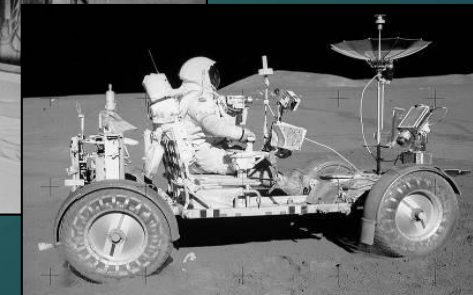
Single
Tire



Single
Track



Apollo
Lunar
Rover
Tire



Welcome, george mason

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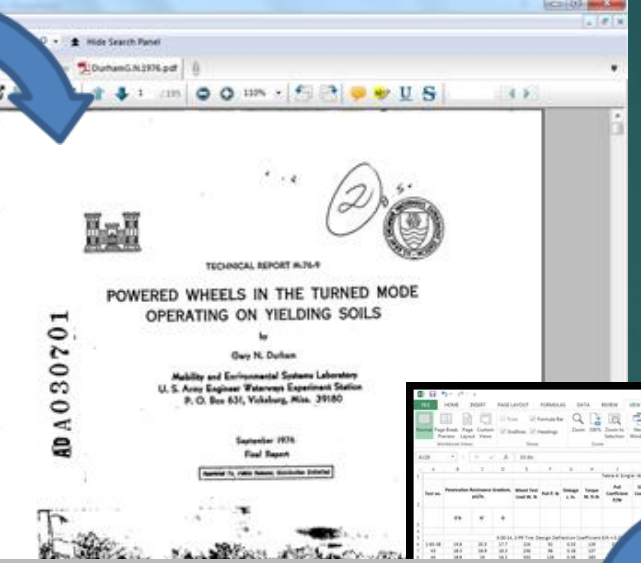
Organization

- joint publications research service arlington va (1900+)

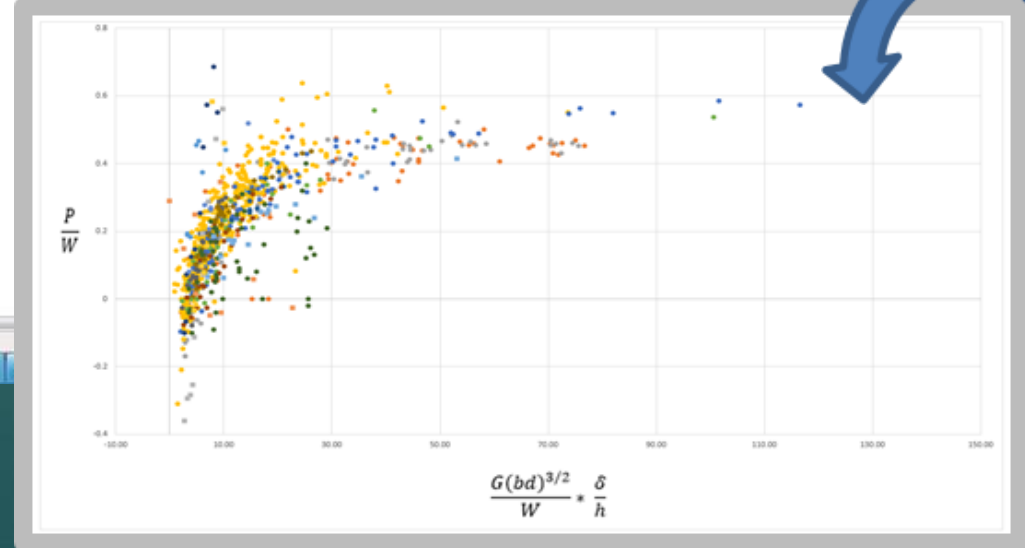
All Results

Showing 1 - 10 out of 39

Author	Year	Title	Rating
Gary H. Durham	1976	Powered Wheels in the Turned Mode Operat...	
G. W. Tansuge	1995	Mobility Numeric System for Predicting to-the...	



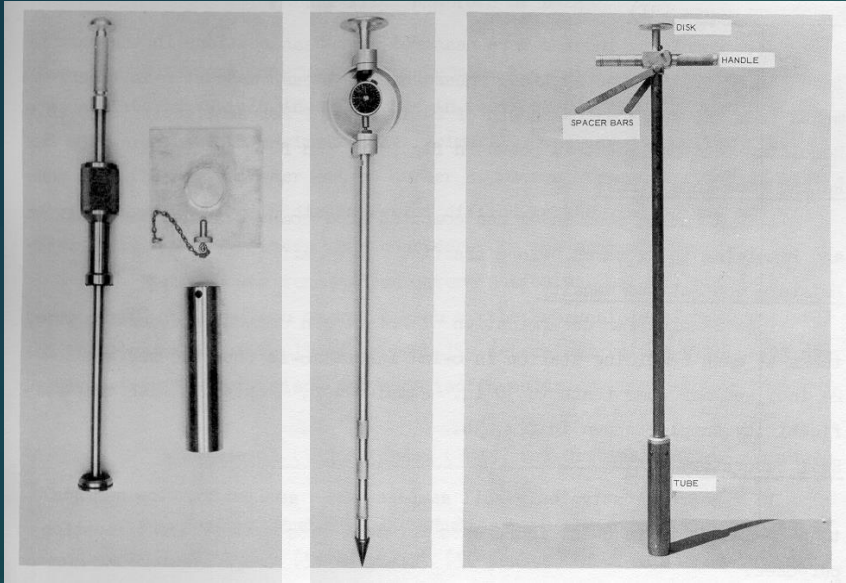
P/W	G(bd) ^{3/2} * δ/h
0.1	10
0.2	20
0.3	30
0.4	40
0.5	50
0.6	60
0.7	70
0.8	80
0.9	90
1.0	100

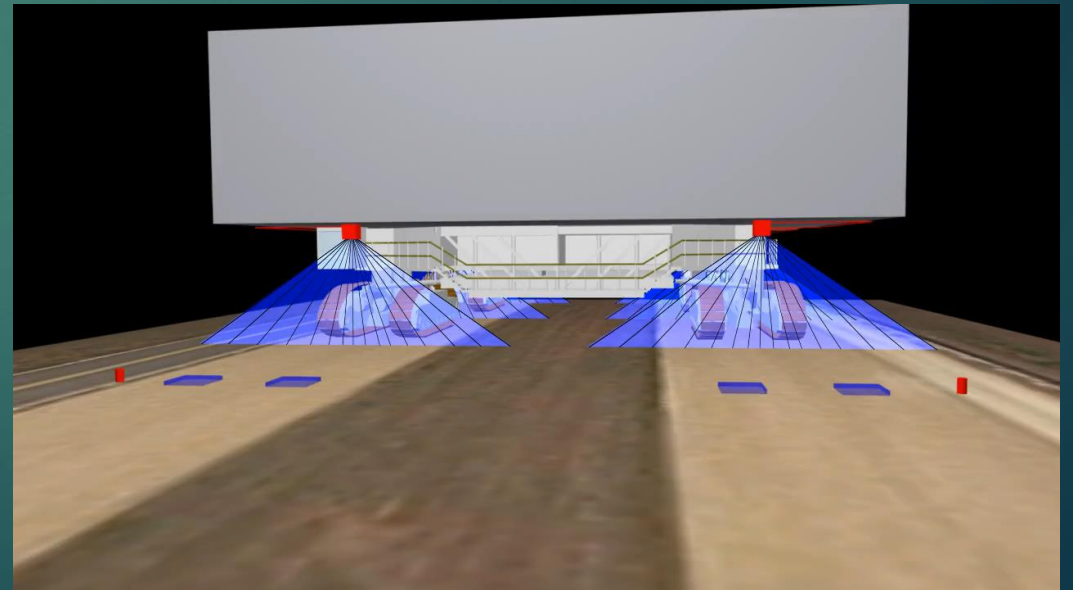
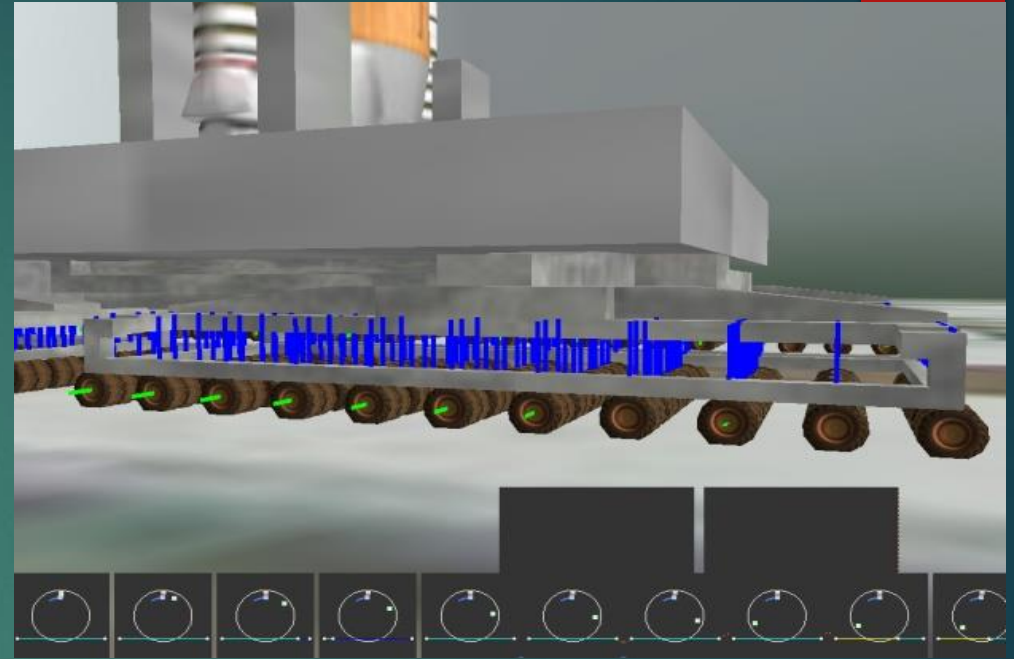






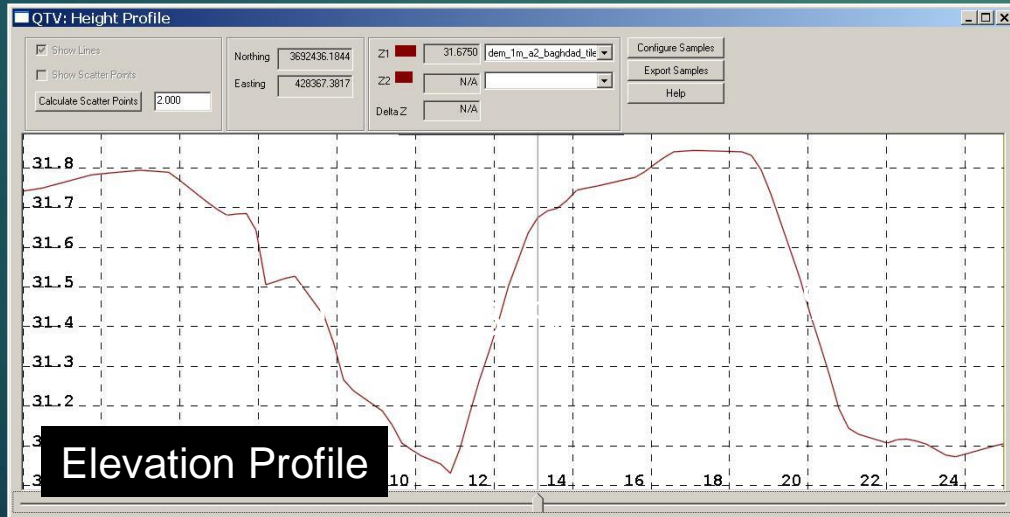
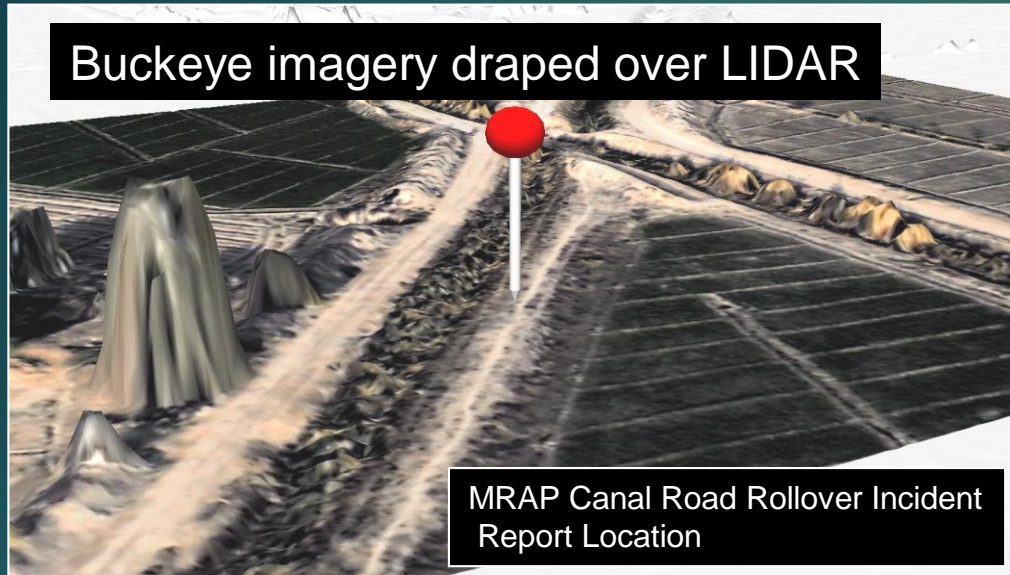




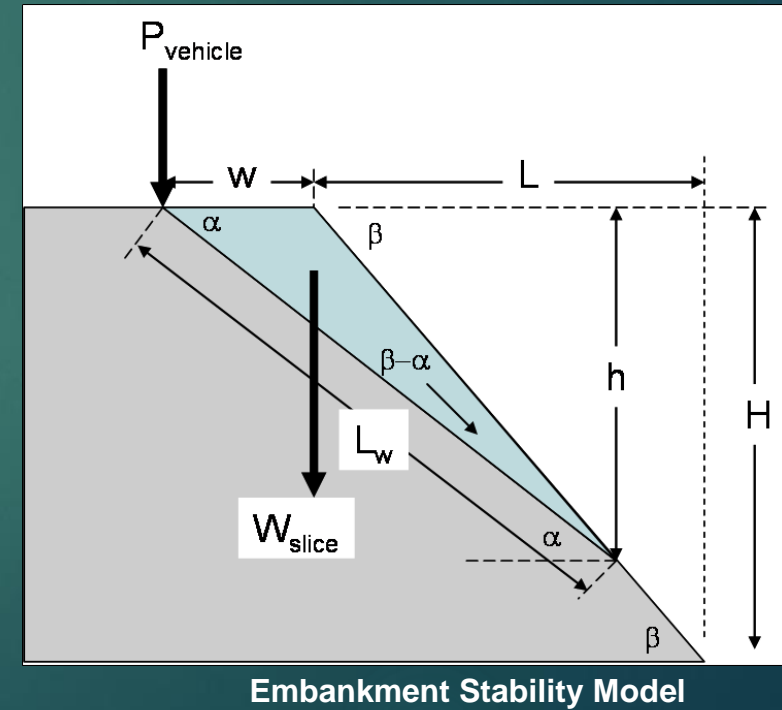




Canal Road Analysis

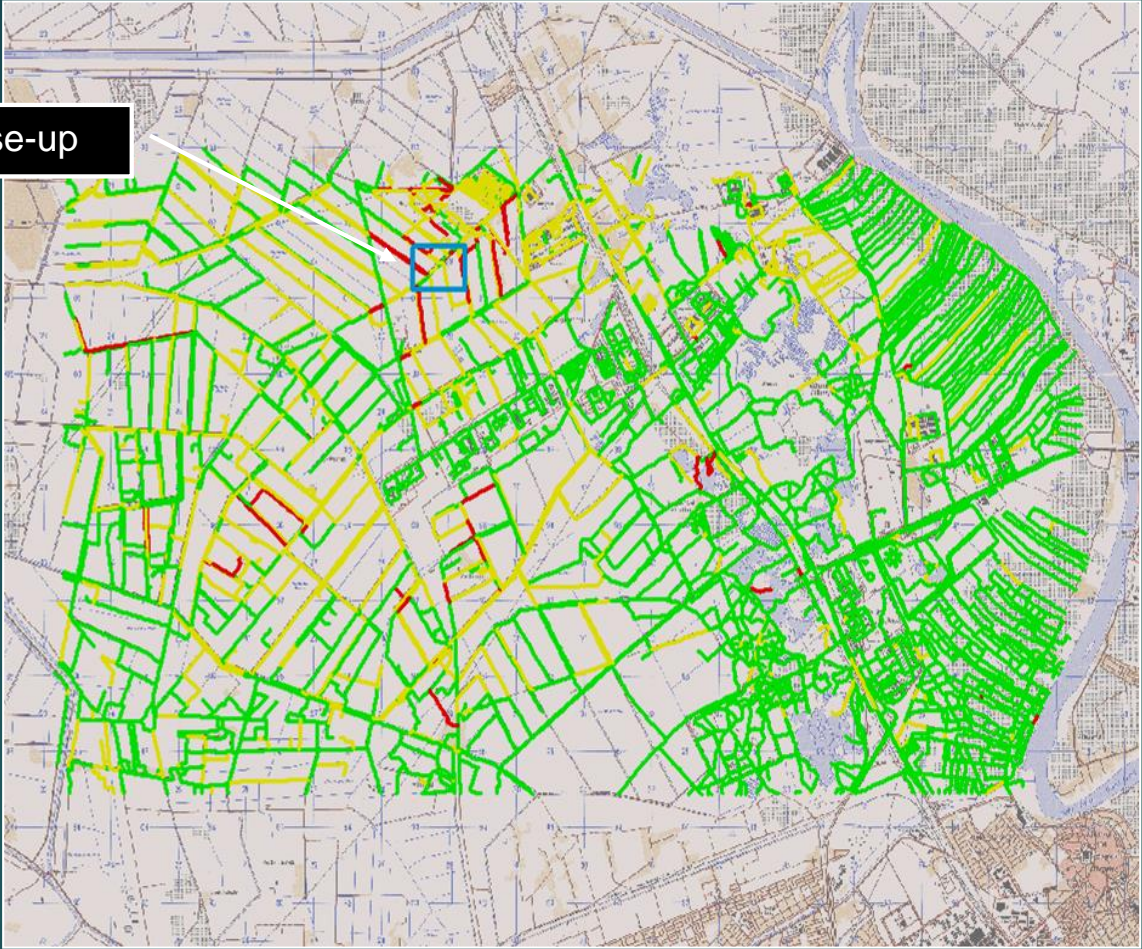


Analyzed as an embankment stability problem under a point wheel-load on a given set of soil conditions



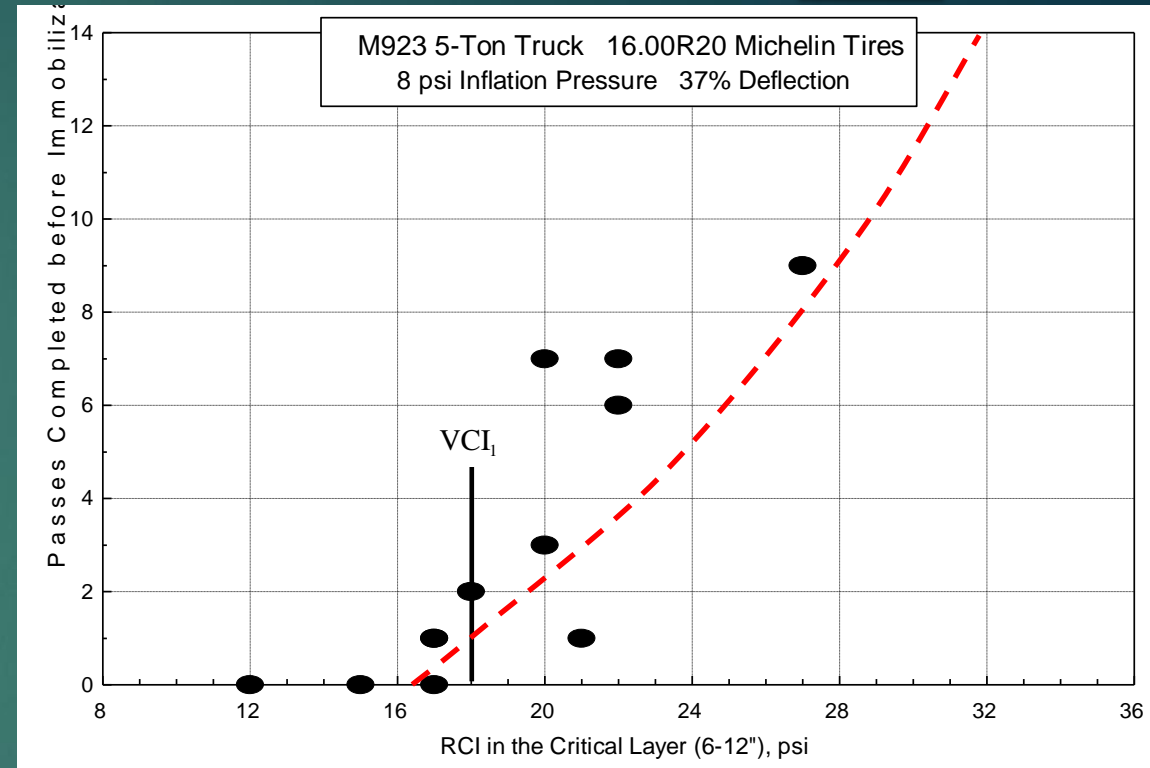


Close-up

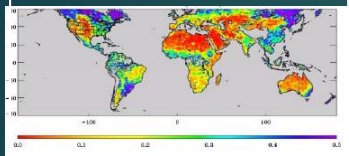


Failure Risk	AOI Percentage
High	2.5
Moderate	27.5
Low	70.0





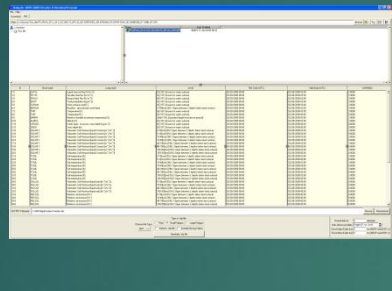
AFWA Soil Moisture GRiB



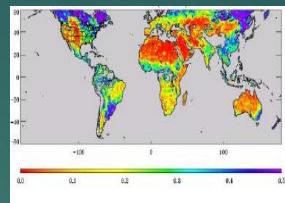
FAO Soil Type Map



Convert GriB to Shape



Clip Area



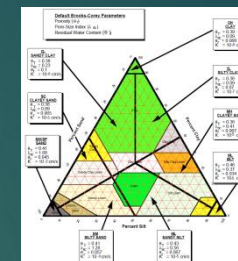
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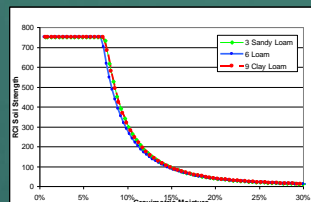
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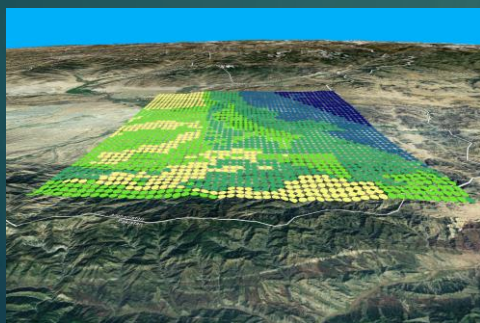
Assign Soil Properties



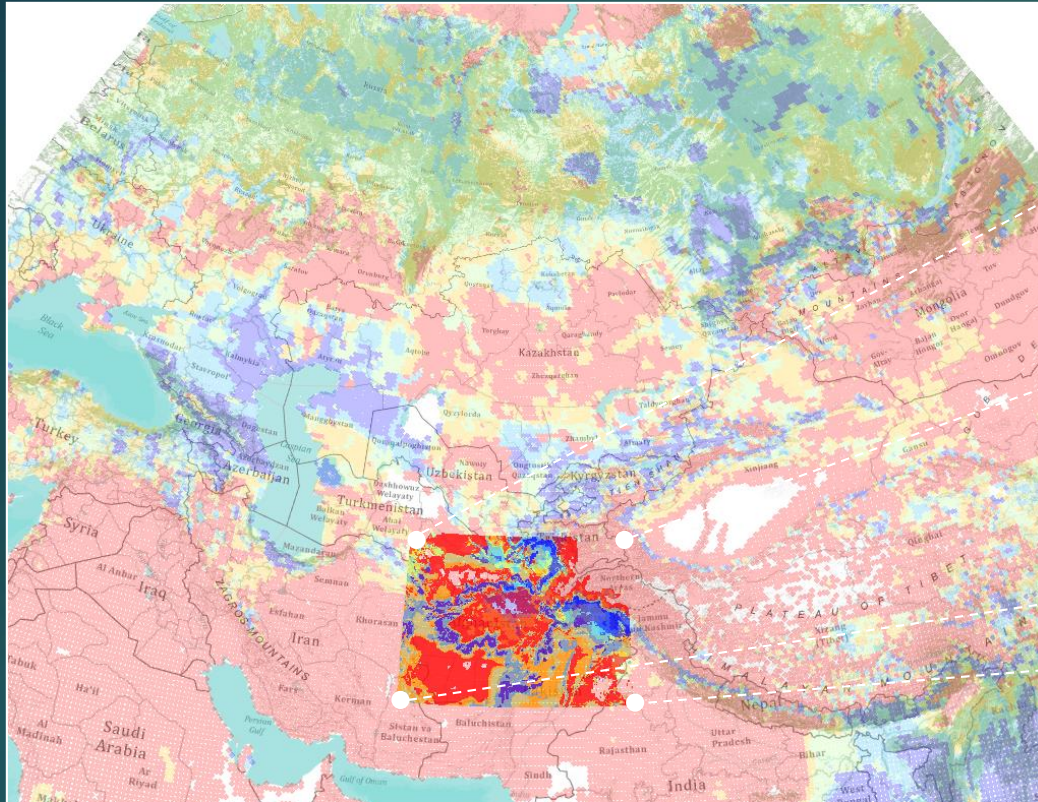
Compute Soil Strength



Volumetric Moisture to Gravimetric Moisture Conversion



25 Kilometer Soil Moisture

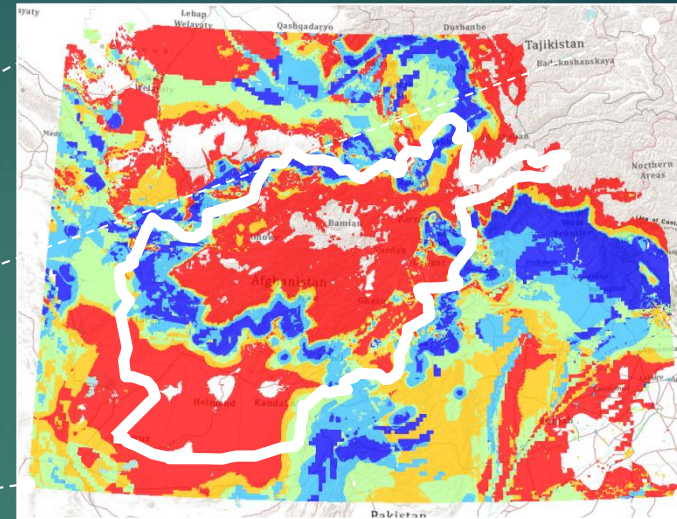


As Resolution Increases Data Storage Requirements are an issue

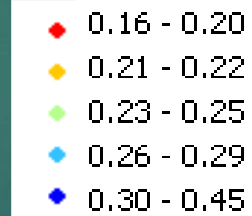
25 km World Map – 1 year - 25 megs

1 km Afghan Map – 1 year - 200 megs

1 km LIS Soil Moisture



Volumetric Soil Moisture



Kilometers

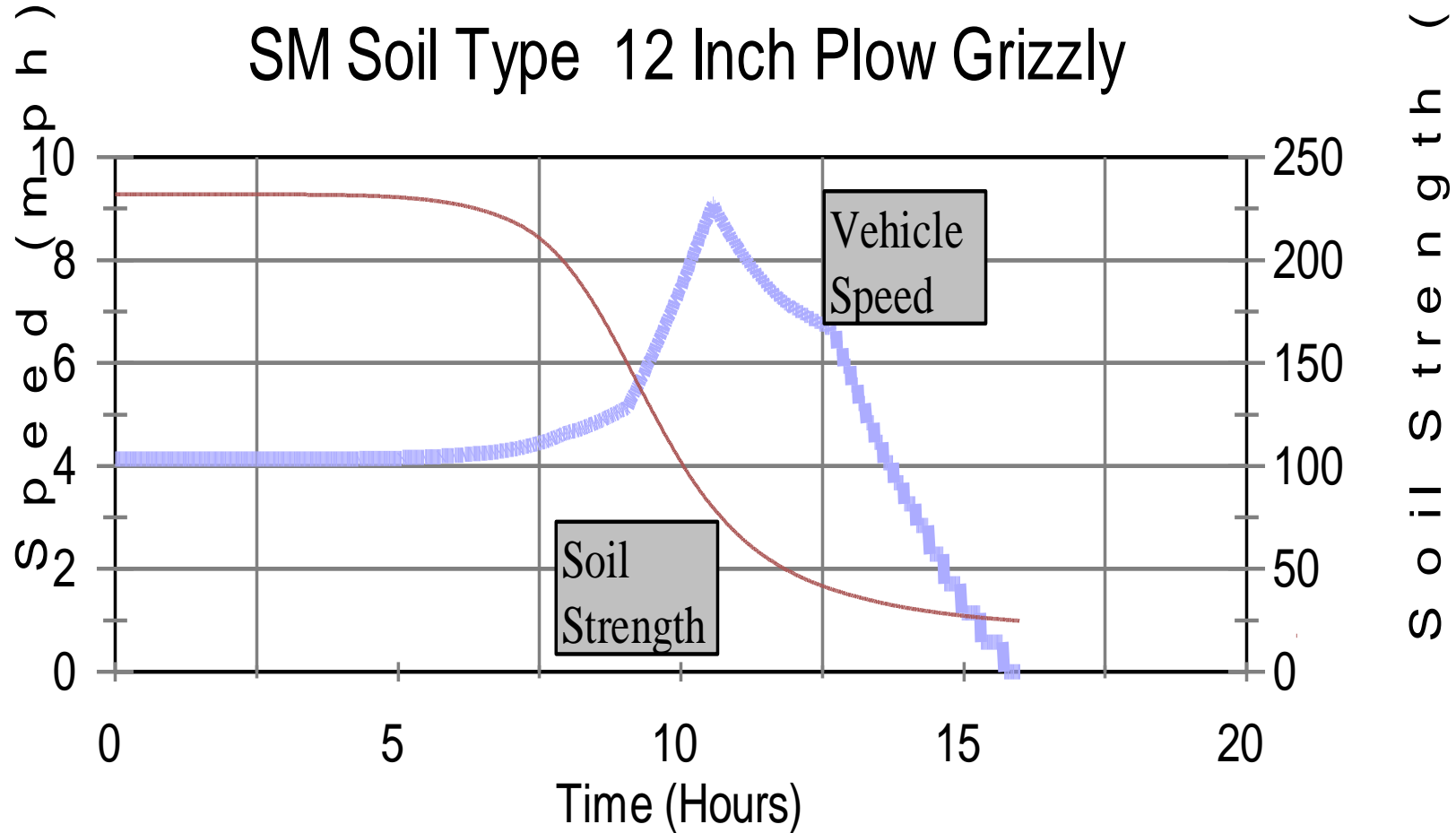


January 21, 0300, 2008

<https://worldview.earthdata.nasa.gov/>

Site LAT3421 3.5 inches Rain

SM Soil Type 12 Inch Plow Grizzly



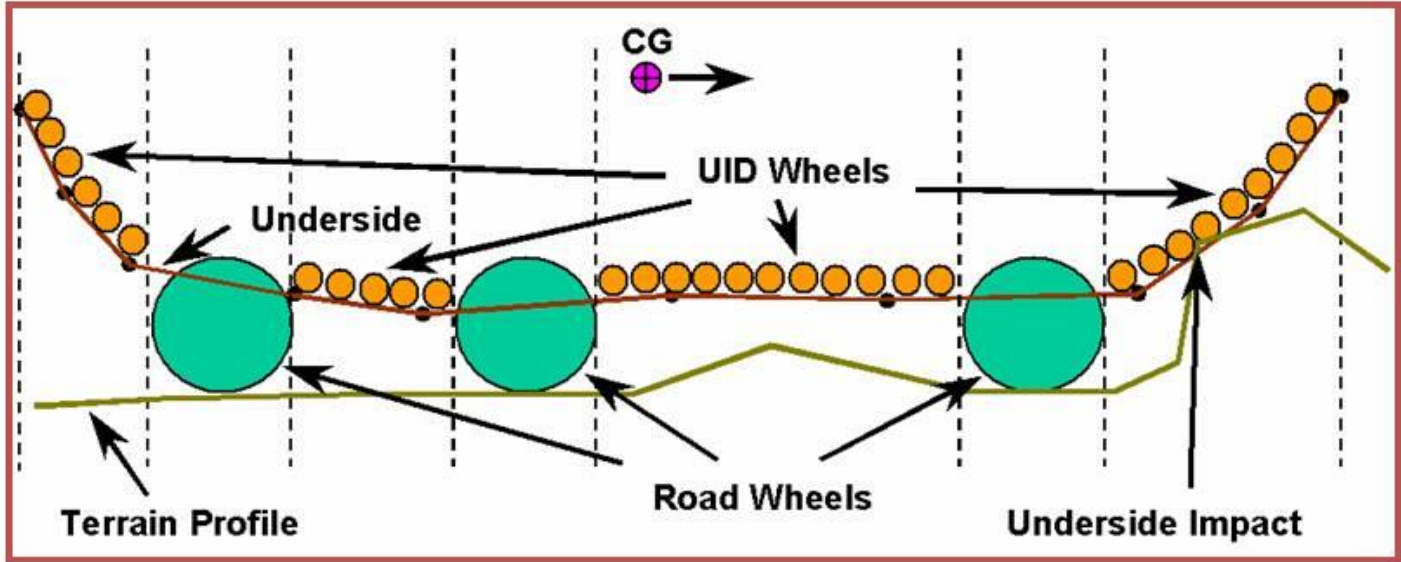
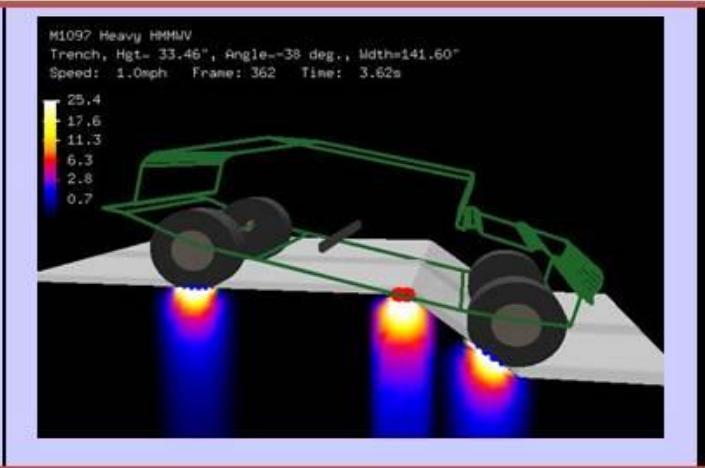
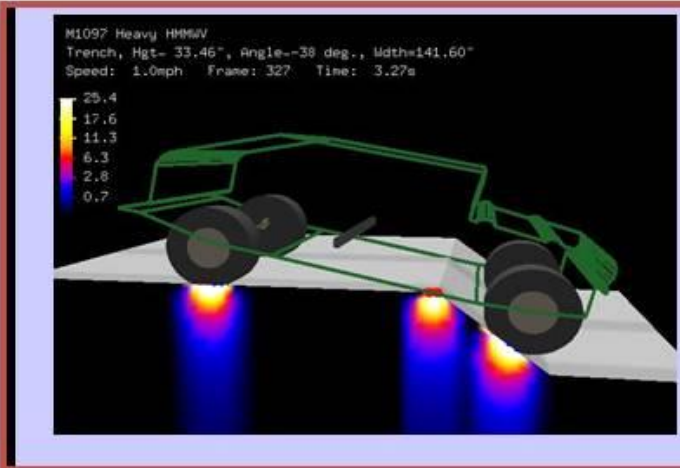


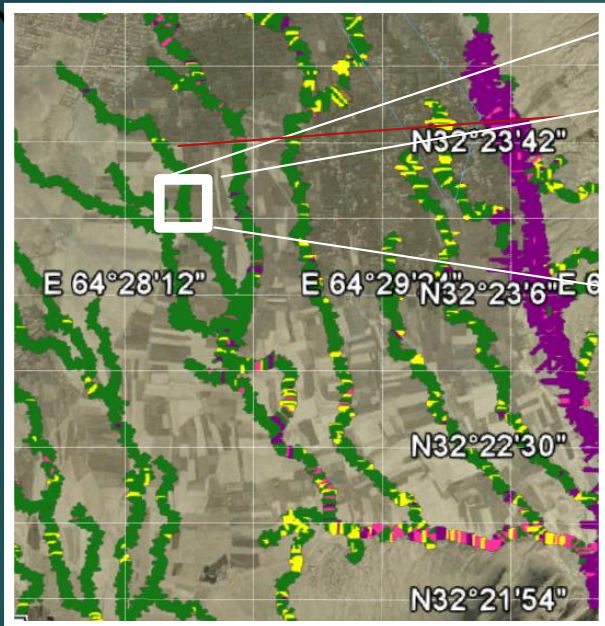
14 July 2019

Forward Supply Area

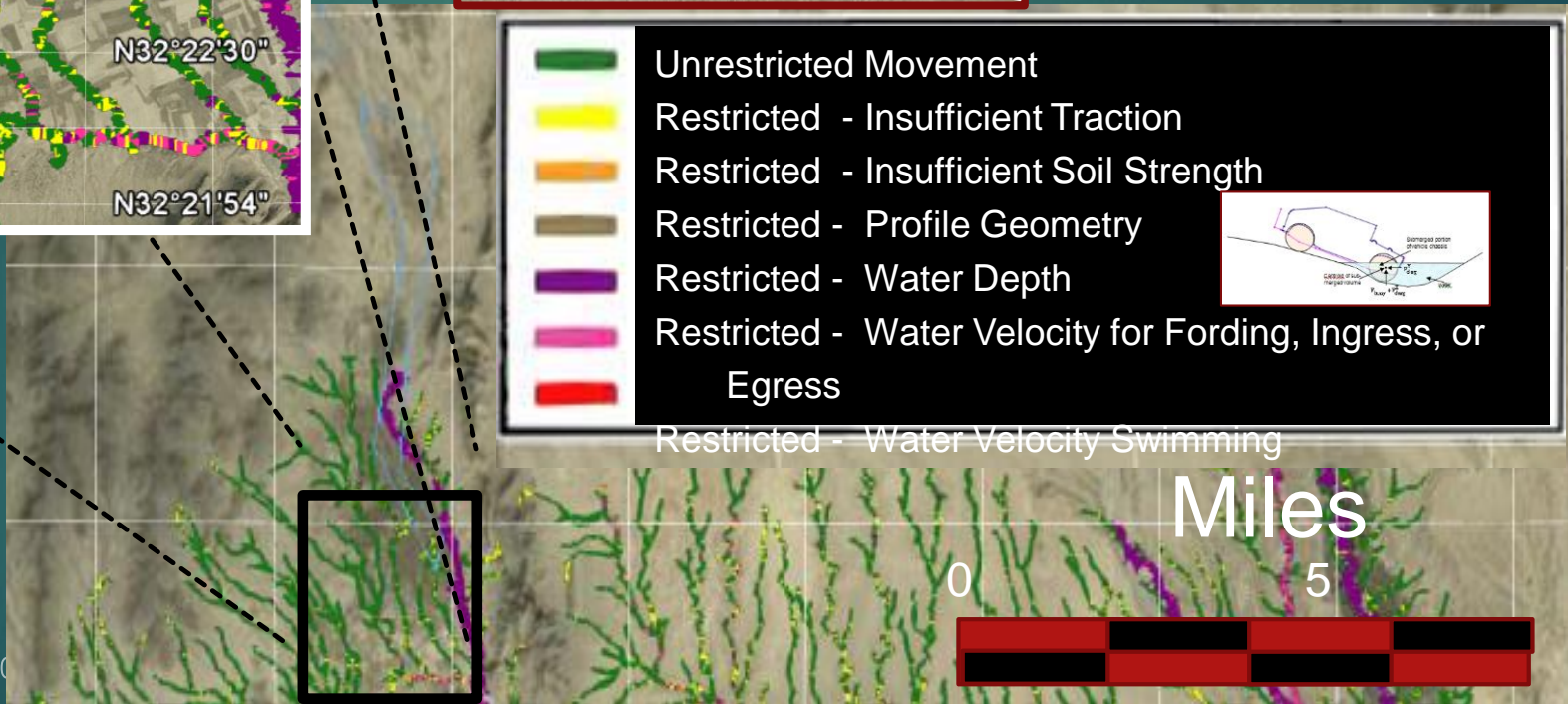


Forward Operating Base





	Unrestricted Movement
	Restricted - Insufficient Traction
	Restricted - Insufficient Soil Strength
	Restricted - Profile Geometry
	Restricted - Water Depth
	Restricted - Water Velocity for Fording, Ingress, or Egress
	Restricted - Water Velocity Swimming



14 July 20



