مؤتمر عجمان
الدولي الخامس للبيئة

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High-Definition NDVI Sampling of Arabian Protected Areas to Assess Rangeland Condition

Dr David Gallacher
Zayed University

Tamer Khafaga MSc
Dubai Desert Conservation Reserve

What's the problem?

- Proof of vegetation change is difficult
  - Historical data is lacking in Arabia
  - Large spatiotemporal variation
- Rangeland is 70% of world's land surface
- Most important is
  - Species ratios
  - Biomass trends

Red, red edge, infrared, or RGB?

NDVI

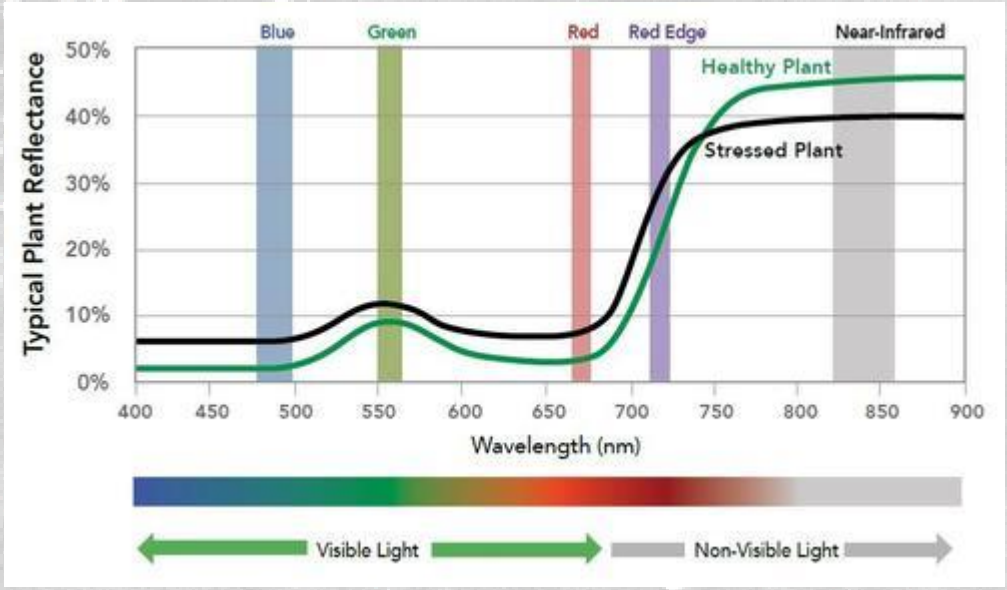
- Developed in 1970s to interpret satellite data
- Proxy measure of chlorophyll (related to growth)
- Broad scale: predict NPP (regional crop yields, droughts, forestry status)
- Narrow scale: agriculture (spatial analysis of monoculture)

Green / RGB

- Proxy measure of palatable biomass?

Red / Red edge

- Proxy measure of wood?



Red, red edge, infrared, or RGB?

Affected by

- Plant health
- Hydration & wind (leaf angle)
- Dust
- Phenology

Higher resolution means

- More detail (good!)
- More heterogeneity (tricky!)
- Therefore, analysis changes with scale

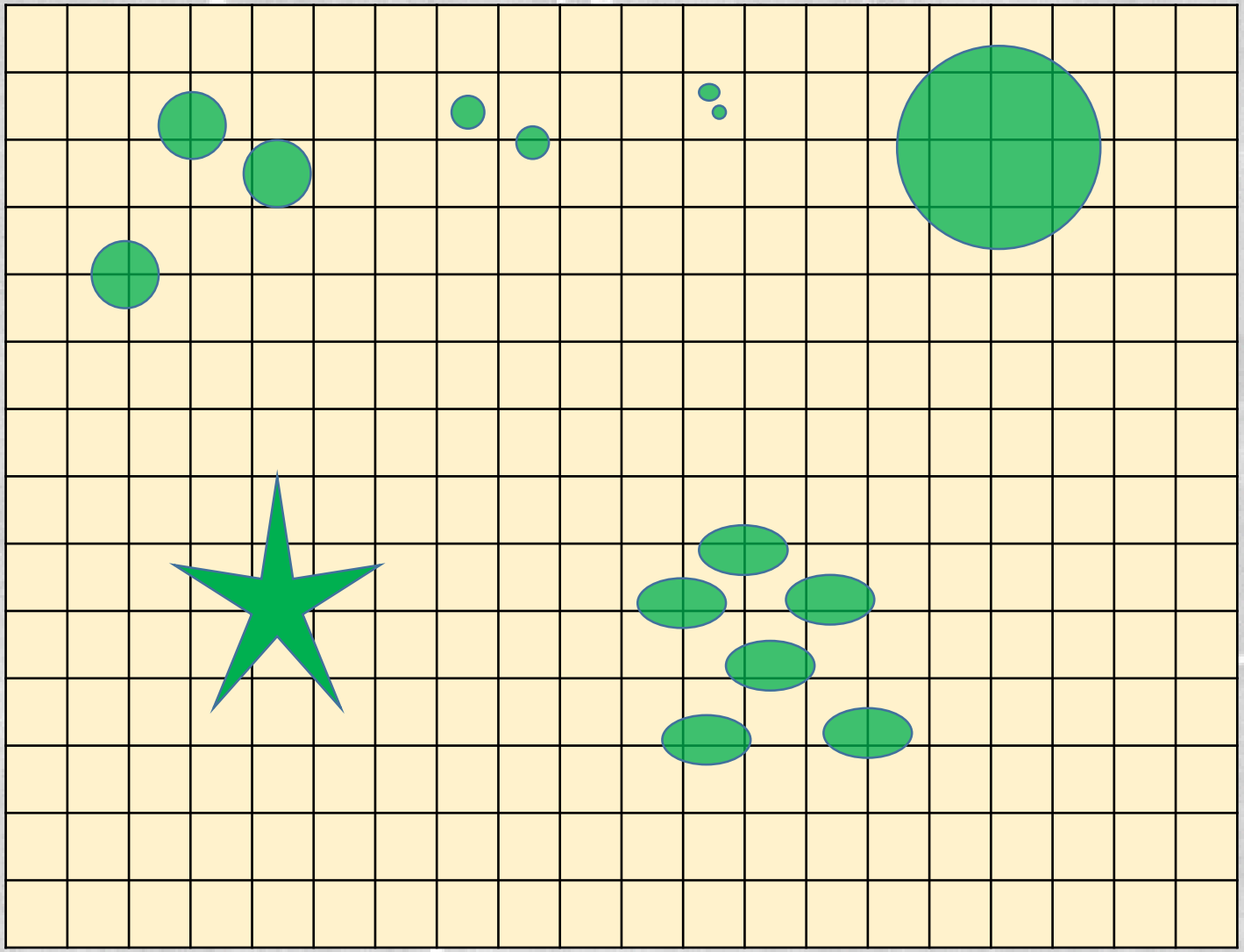
Plants & Pixels

Vegetation index values low, due to

- Sparse plants
- Low chlorophyll
- Low within-canopy leaf area index

Values for non-plant matter

- Sand
- Gravel
- Water



Questions

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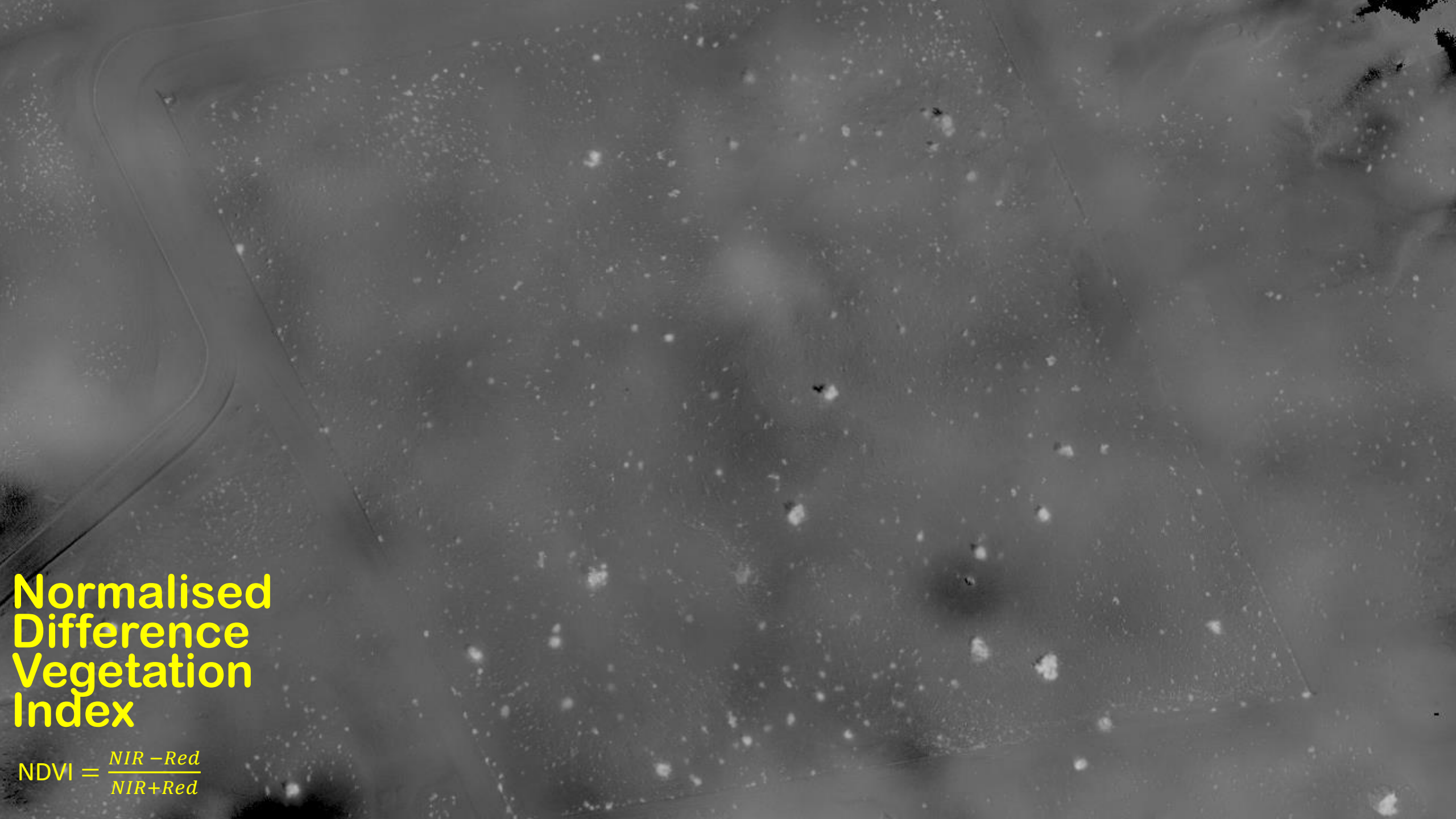
- Are values affected by substrate / aspect / shadow?
- Are background values consistent?



Normalised Difference Vegetation Index

$$\text{NDVI} = \frac{NIR - Red}{NIR + Red}$$

Red edge chlorophyll index

$$\mathrm{RECI} = \frac{NIR}{RedEdge} - 1$$

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  - Need algorithms to calibrate results

Conclusion

- Use other vegetation indices (not NDVI)
- Need algorithms to interpret biomass proxy
- For many purposes, RGB is equal or better