

# Mapping Dust Sources Over North Africa Using MISR Winds and Aerosol Products

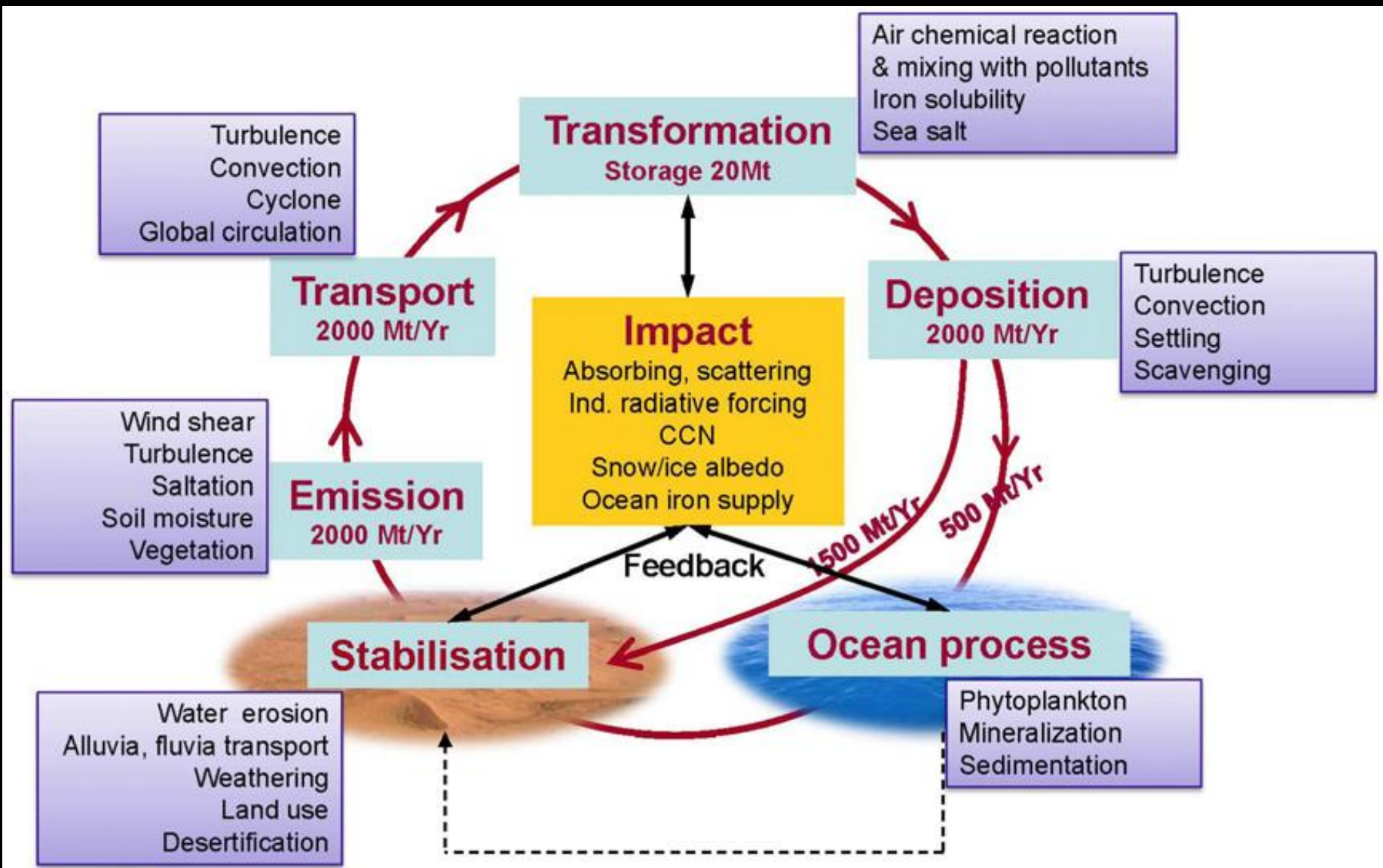
E. Michelle Neely<sup>1</sup>,

*Mentors:* Olga V. Kalashnikova<sup>2</sup>, and Michael J. Garay<sup>2</sup>

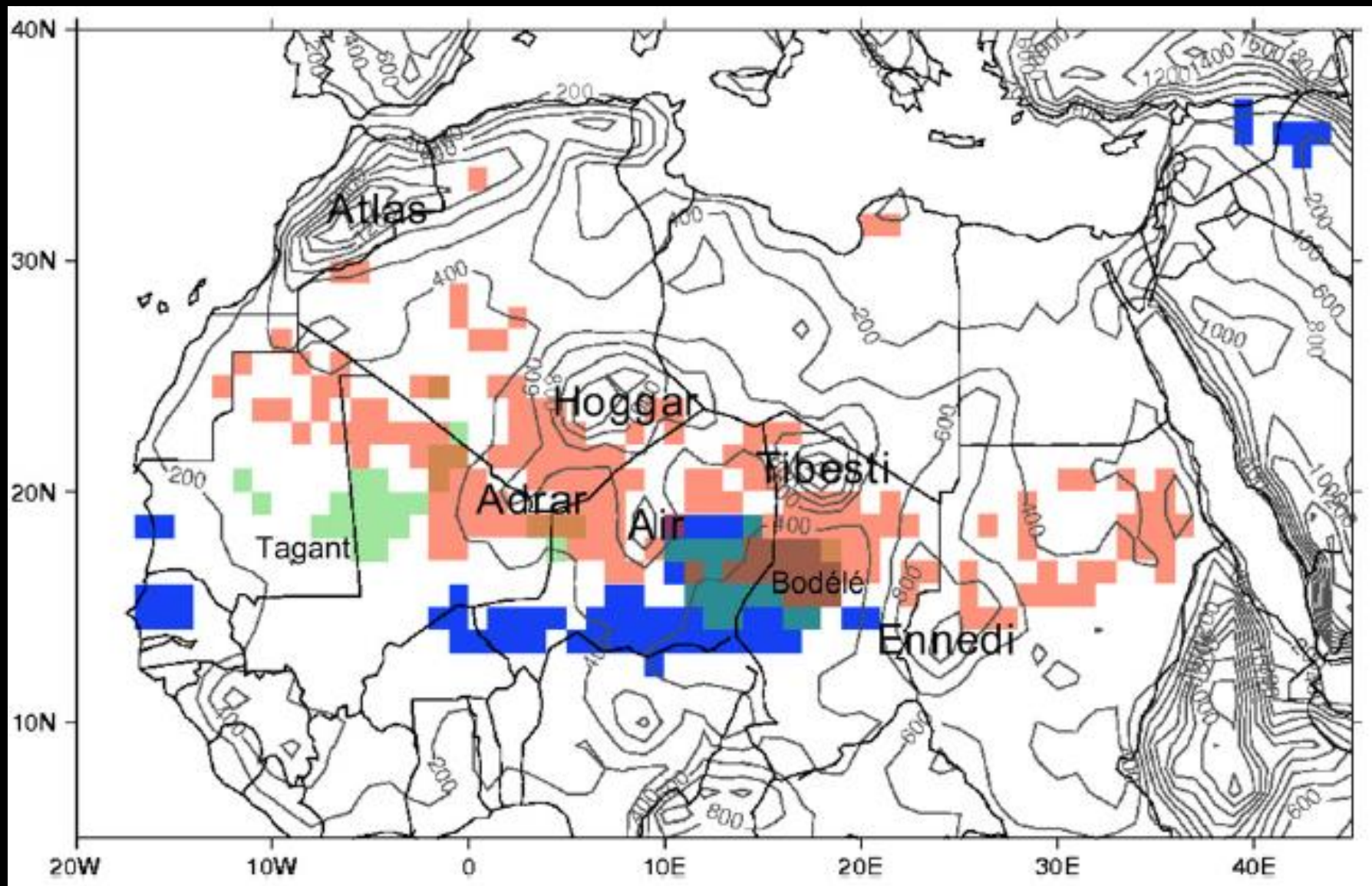
<sup>1</sup>Jet Propulsion Laboratory, California Institute of Technology, Student-Faculty Programs, Pasadena, CA, USA

<sup>2</sup>Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

# Background

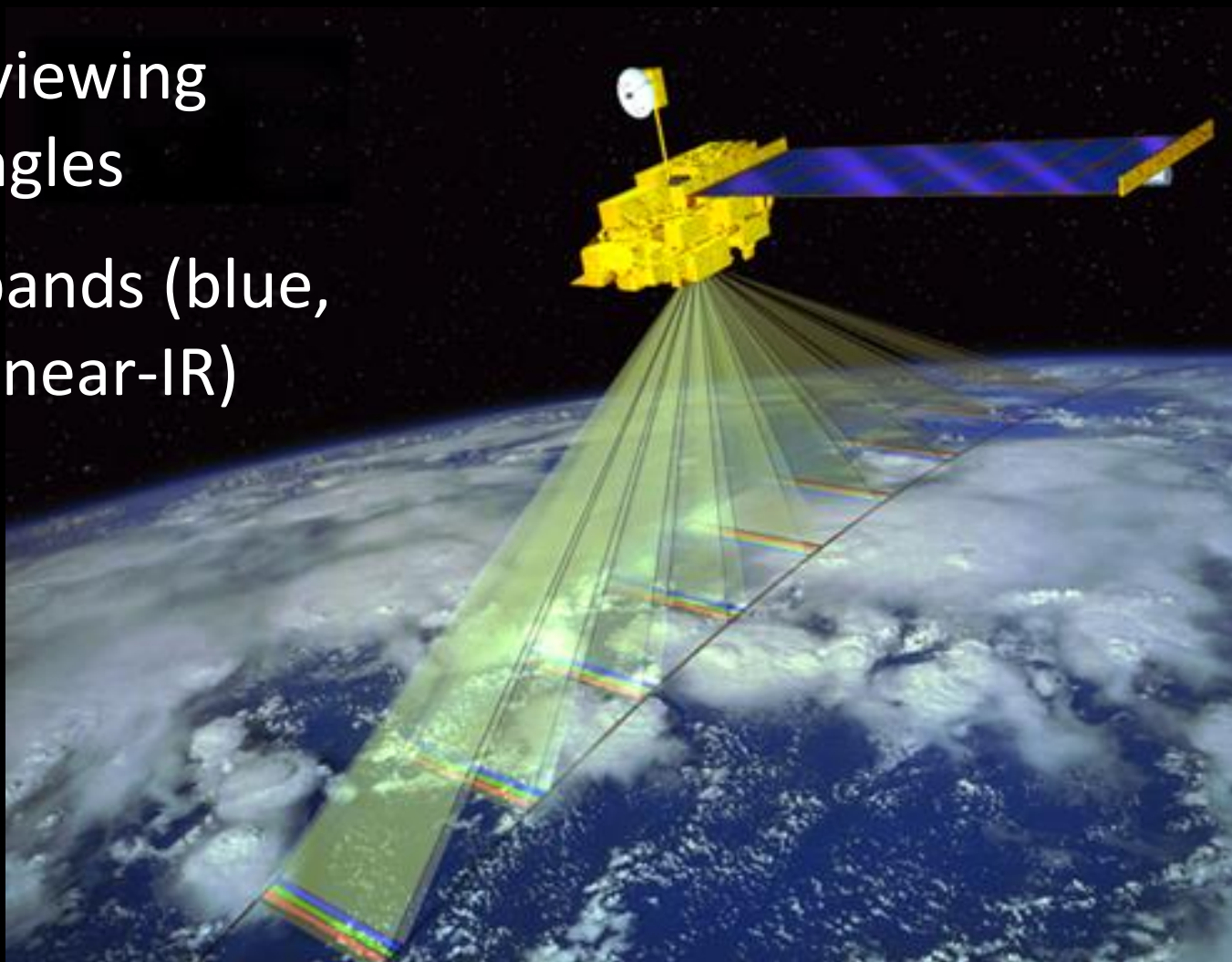


# Previous Techniques



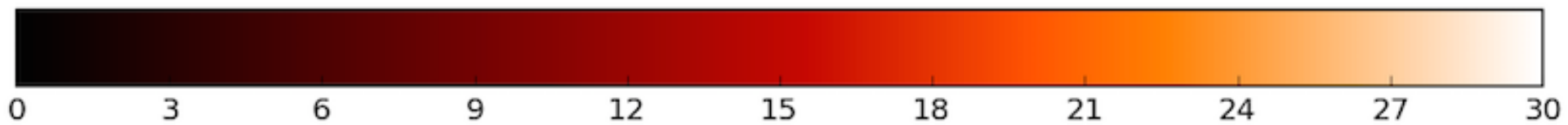
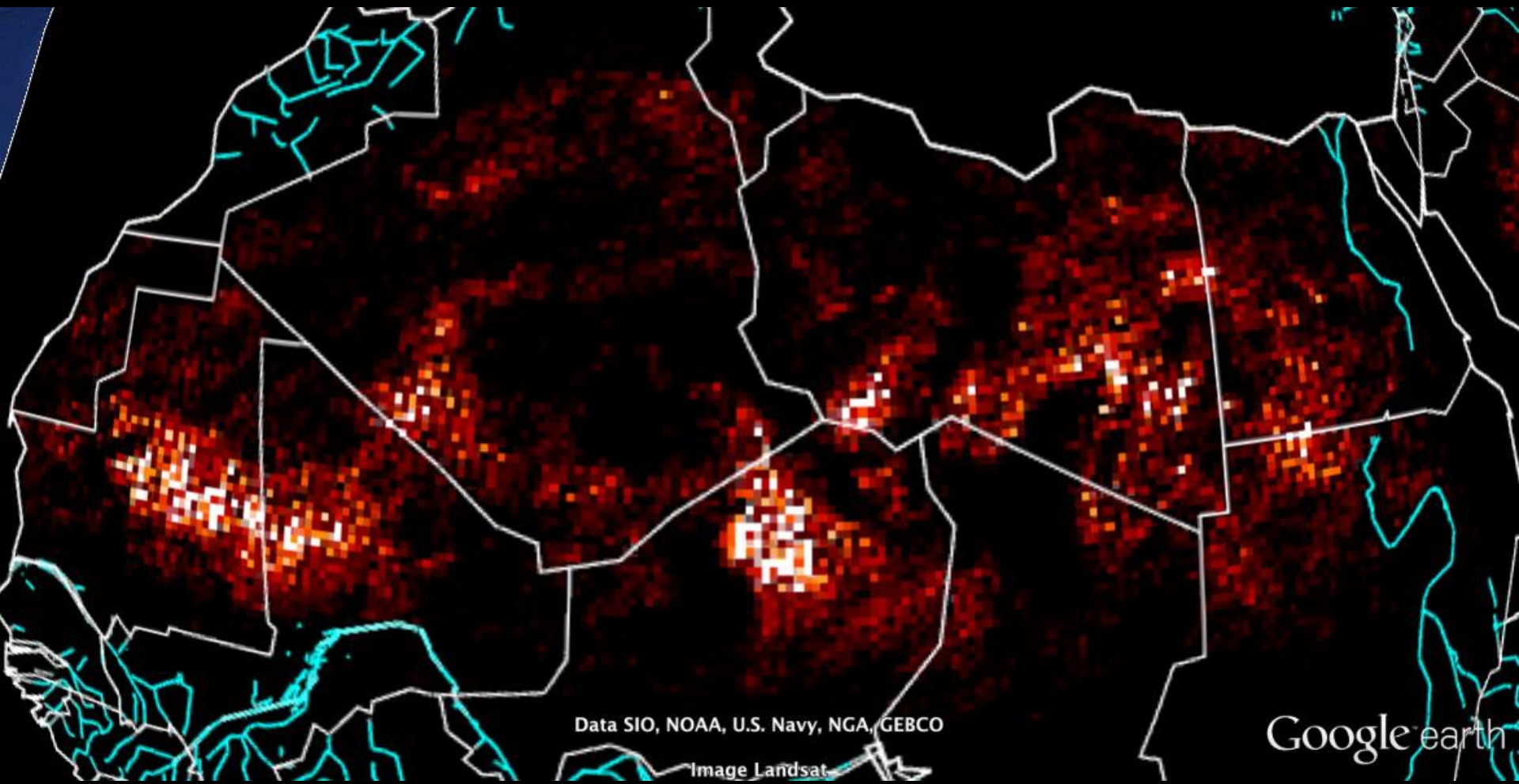


- 10:30 am daily
- 9 cameras viewing different angles
- 4 spectral bands (blue, green, red, near-IR)



# MISR Technique

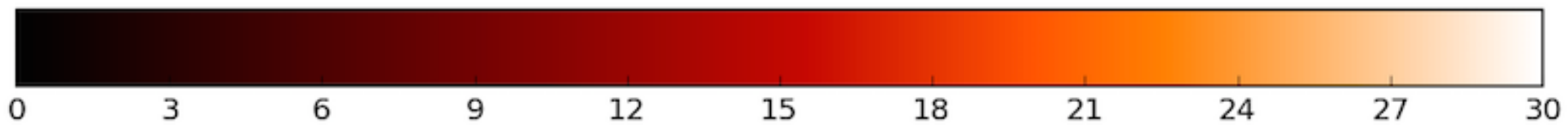
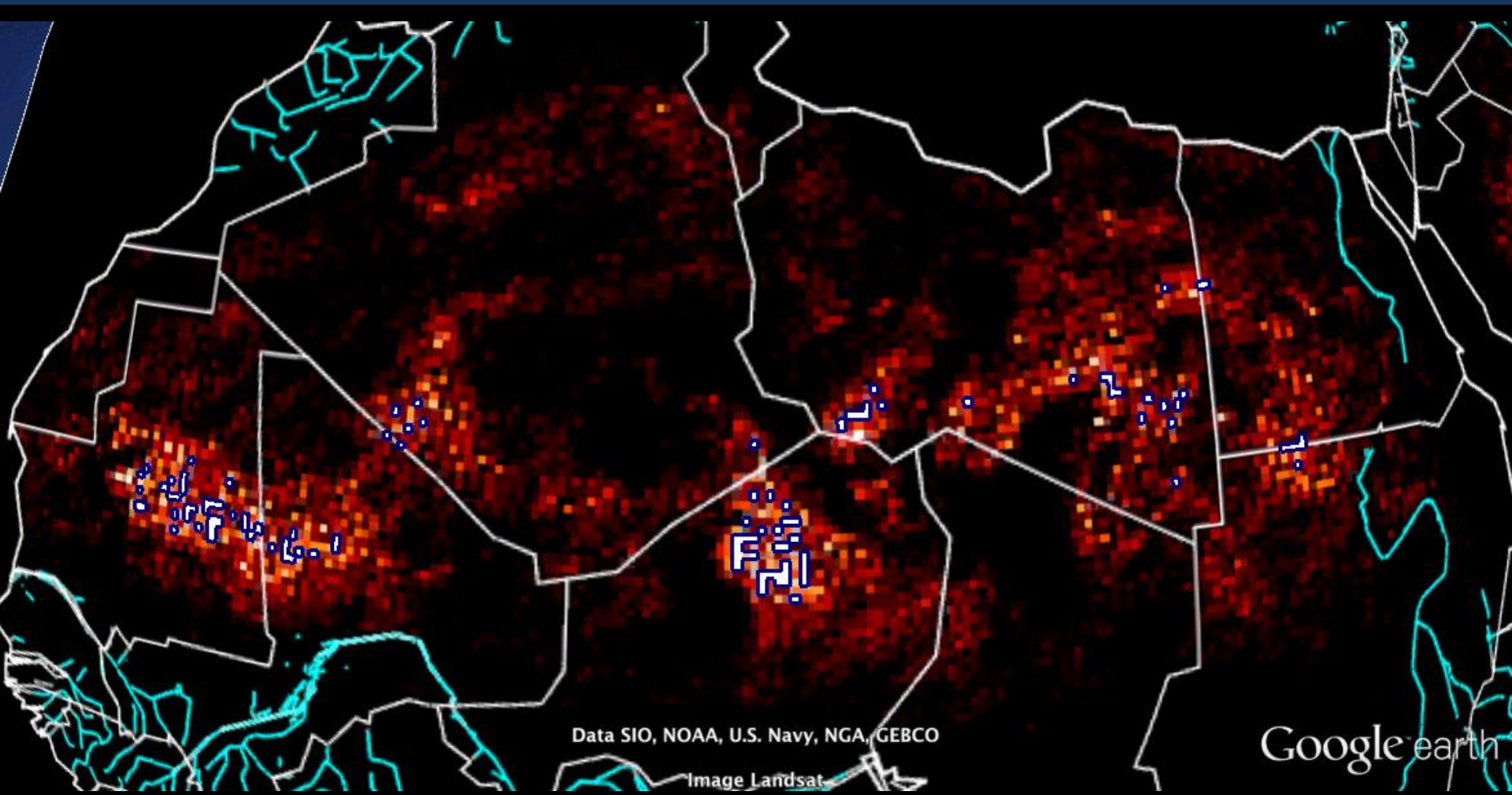
Frequency of Wind Observations  $>40$  m/s





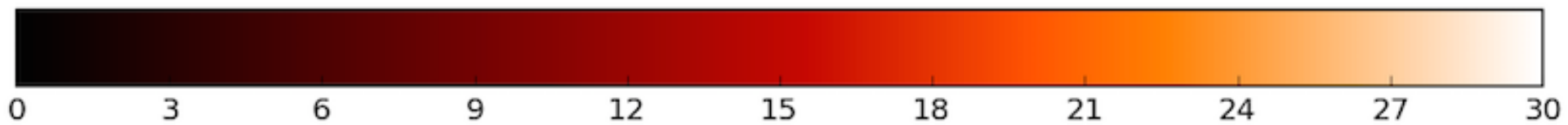
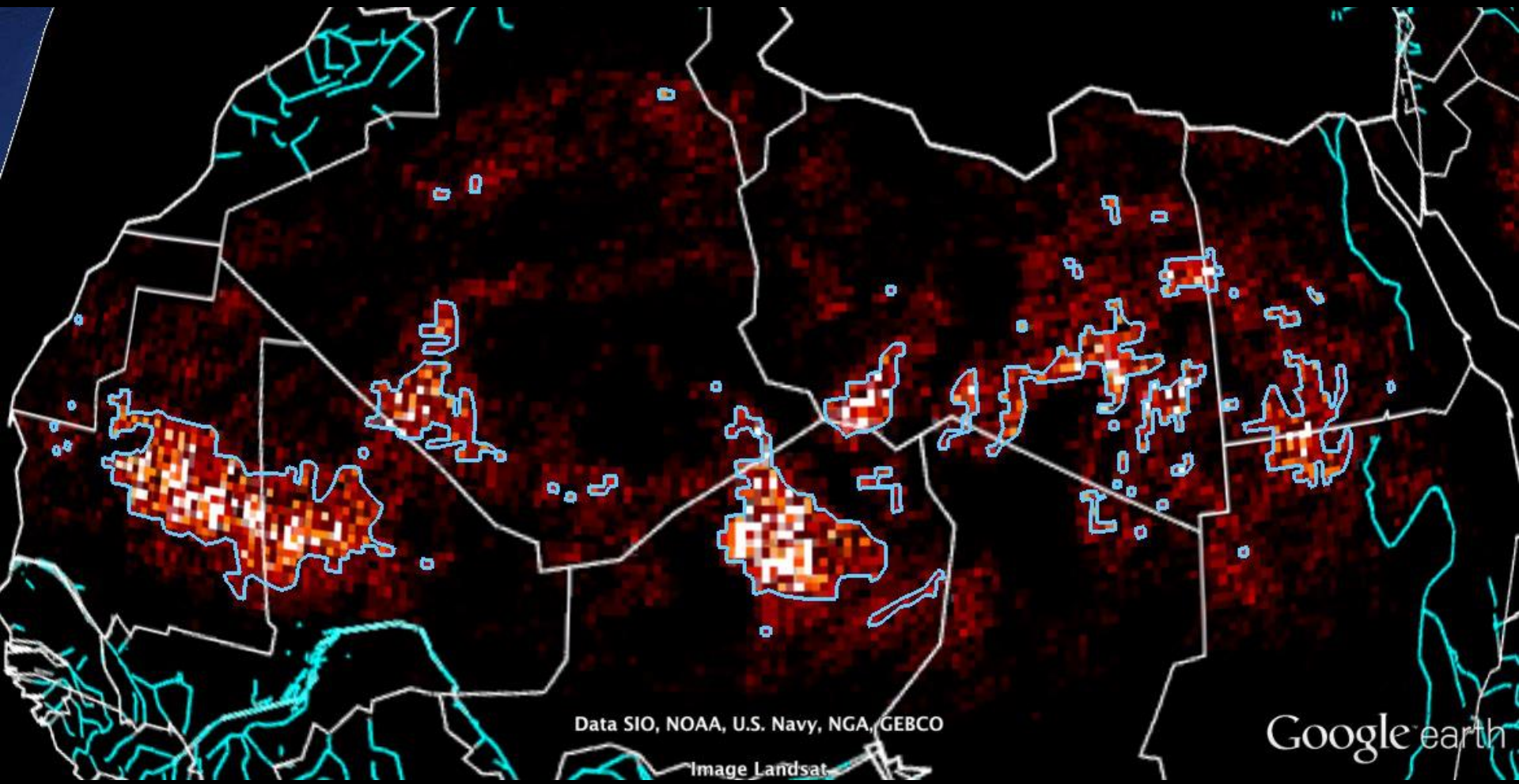
# MISR Technique

## Frequency of Wind Observations $>40$ m/s



# MISR Technique

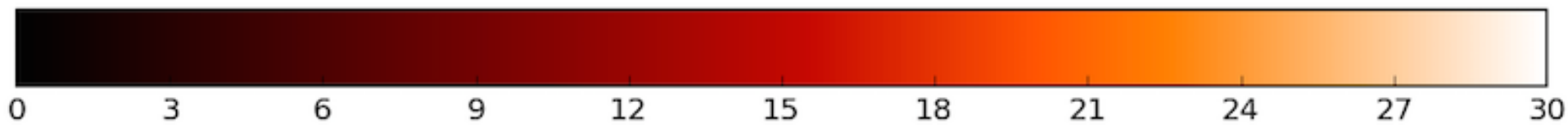
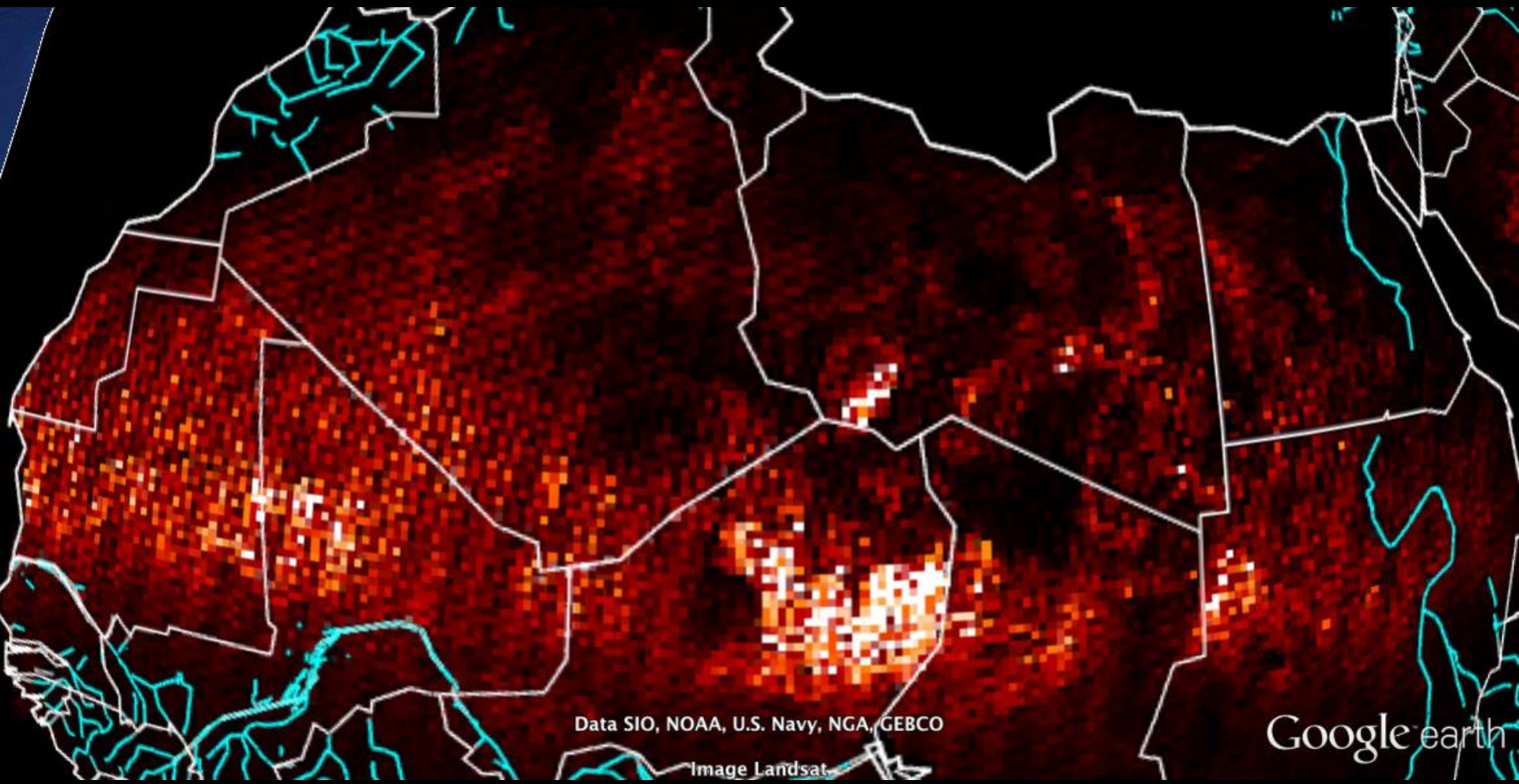
Frequency of Wind Observations  $>40$  m/s





# MISR Technique

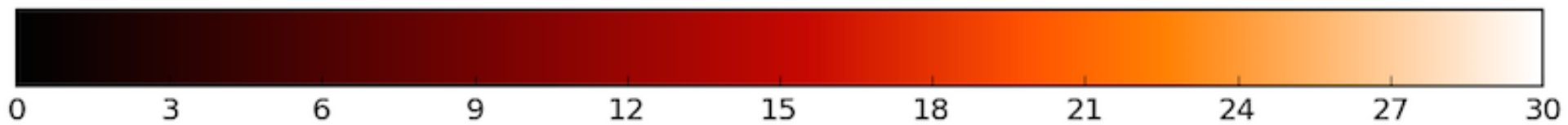
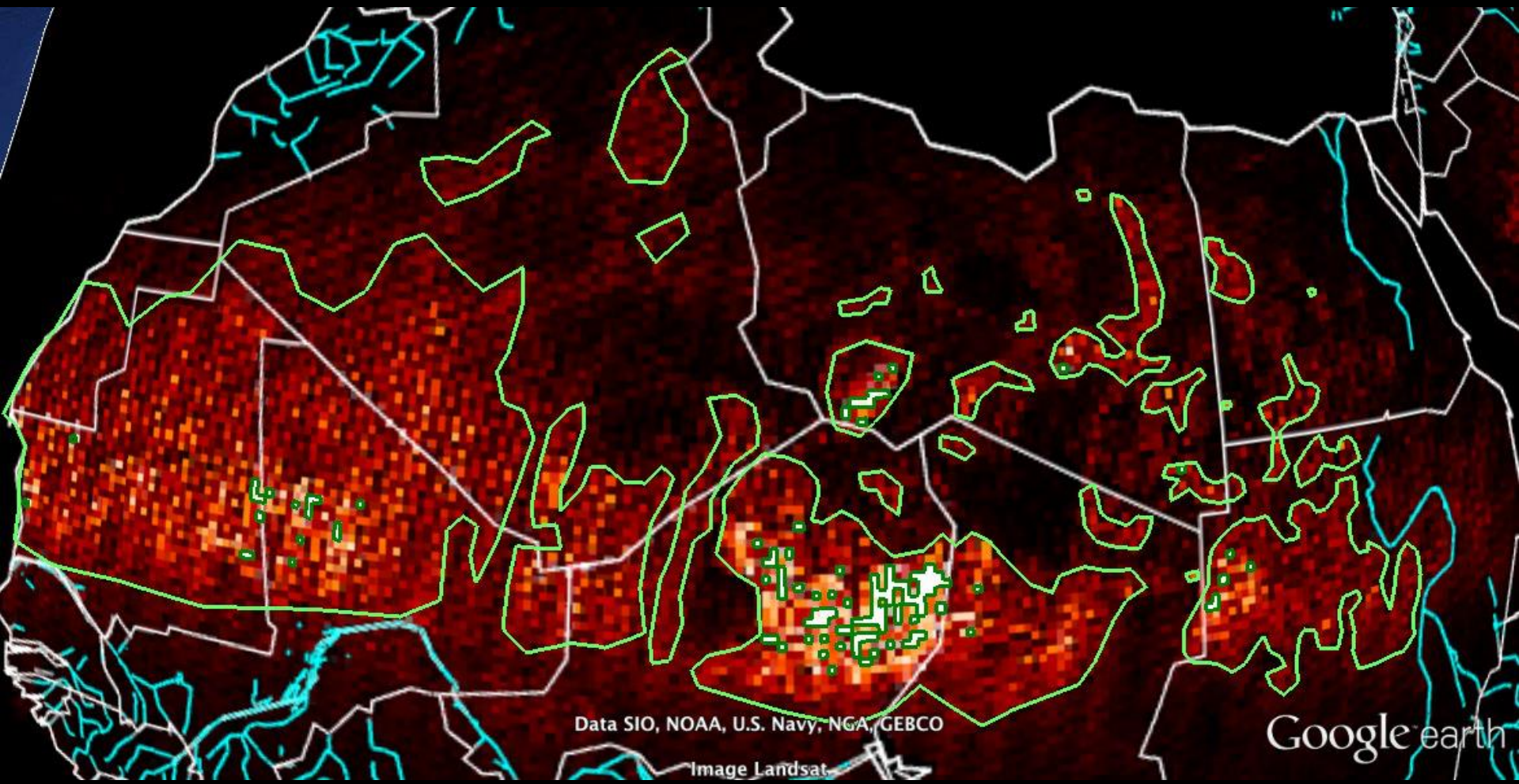
Frequency of Dust Fraction  $>0.6$  with AOD  $>0.5$





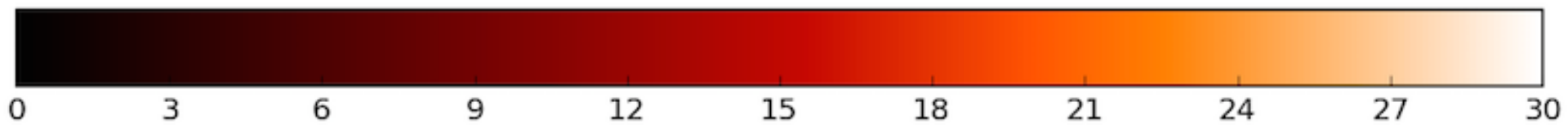
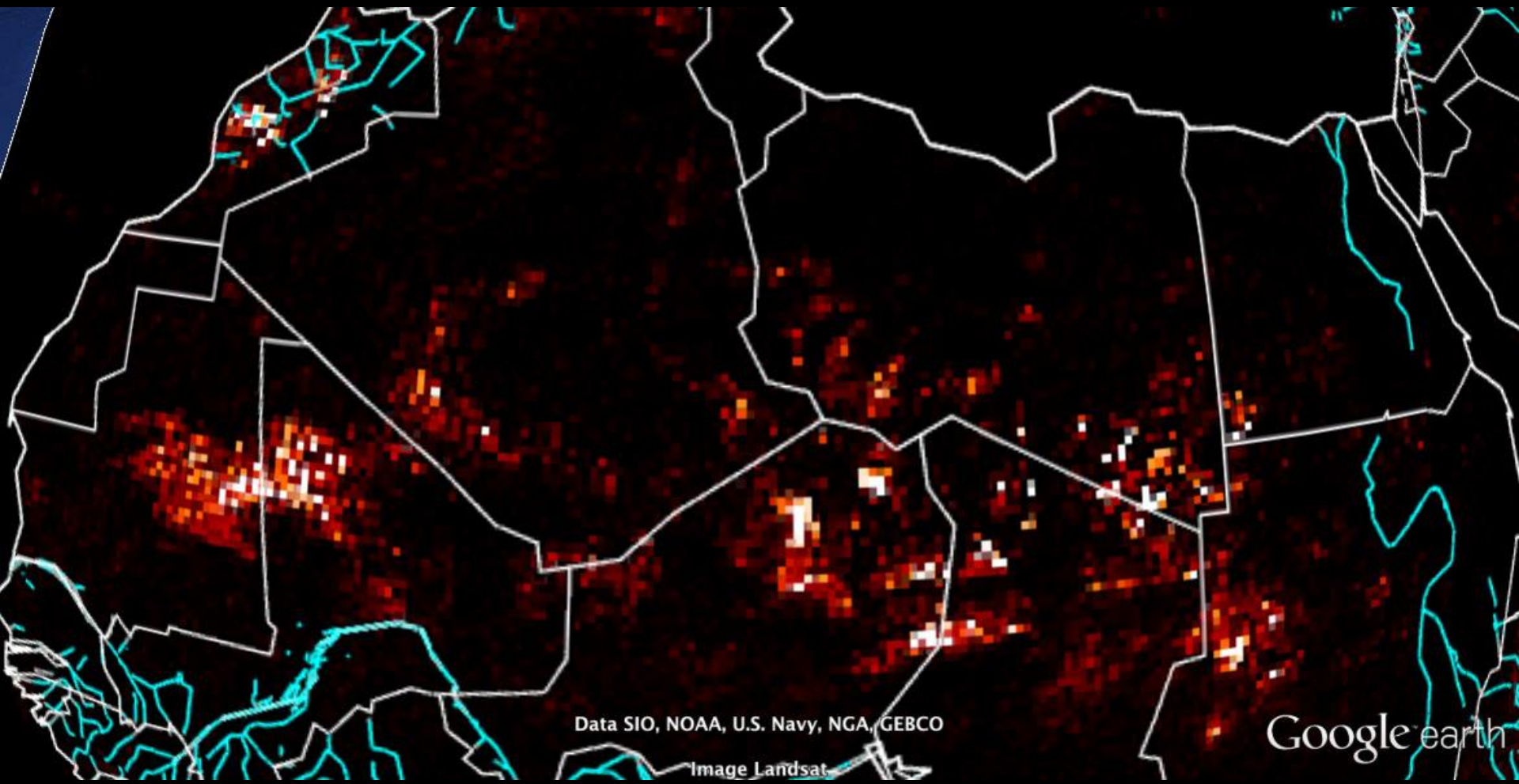
# MISR Technique

Frequency of Dust Fraction  $>0.6$  with AOD  $>0.5$



# MISR Technique

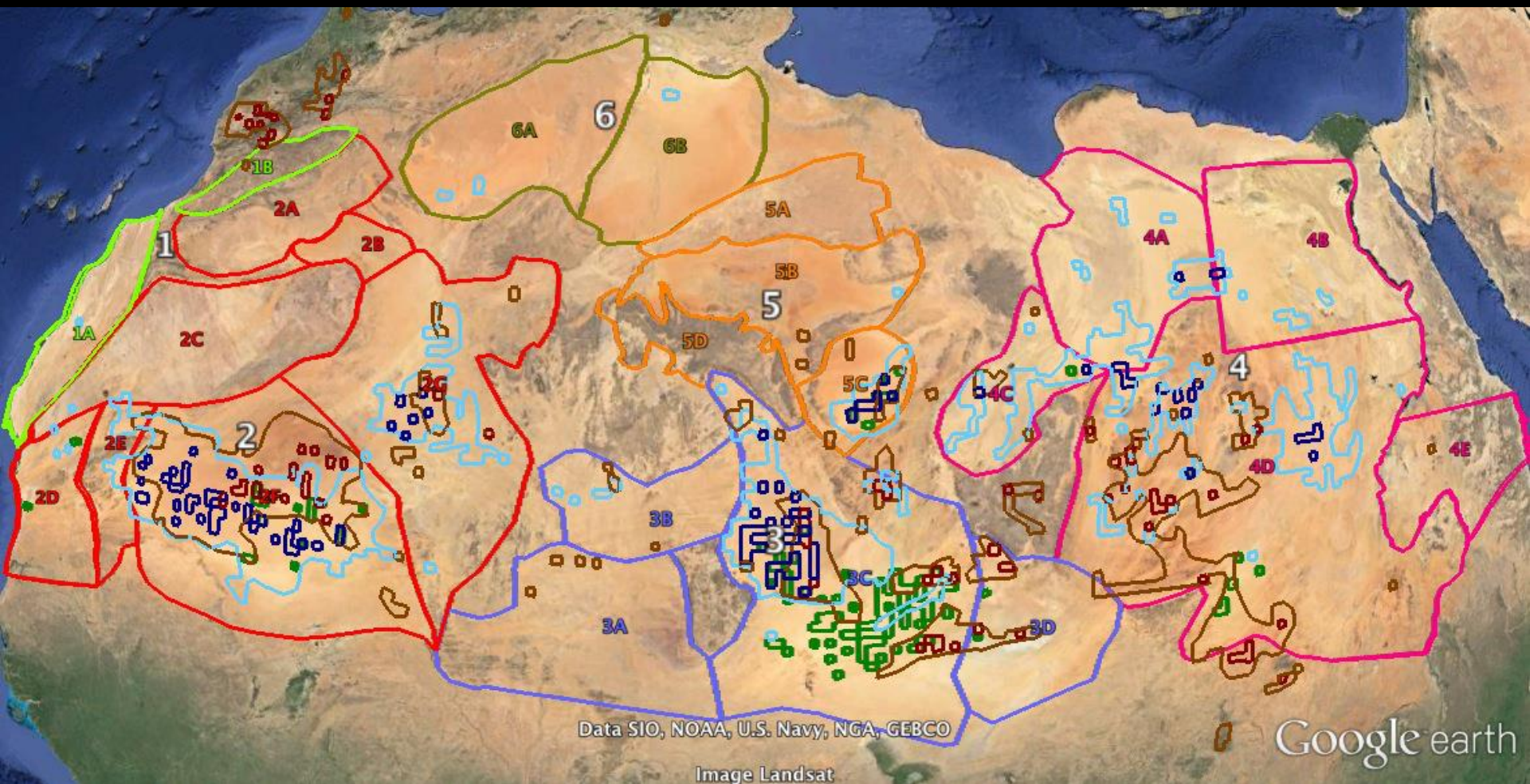
## Frequency of Dust Fraction $>0.9$





# MISR Technique

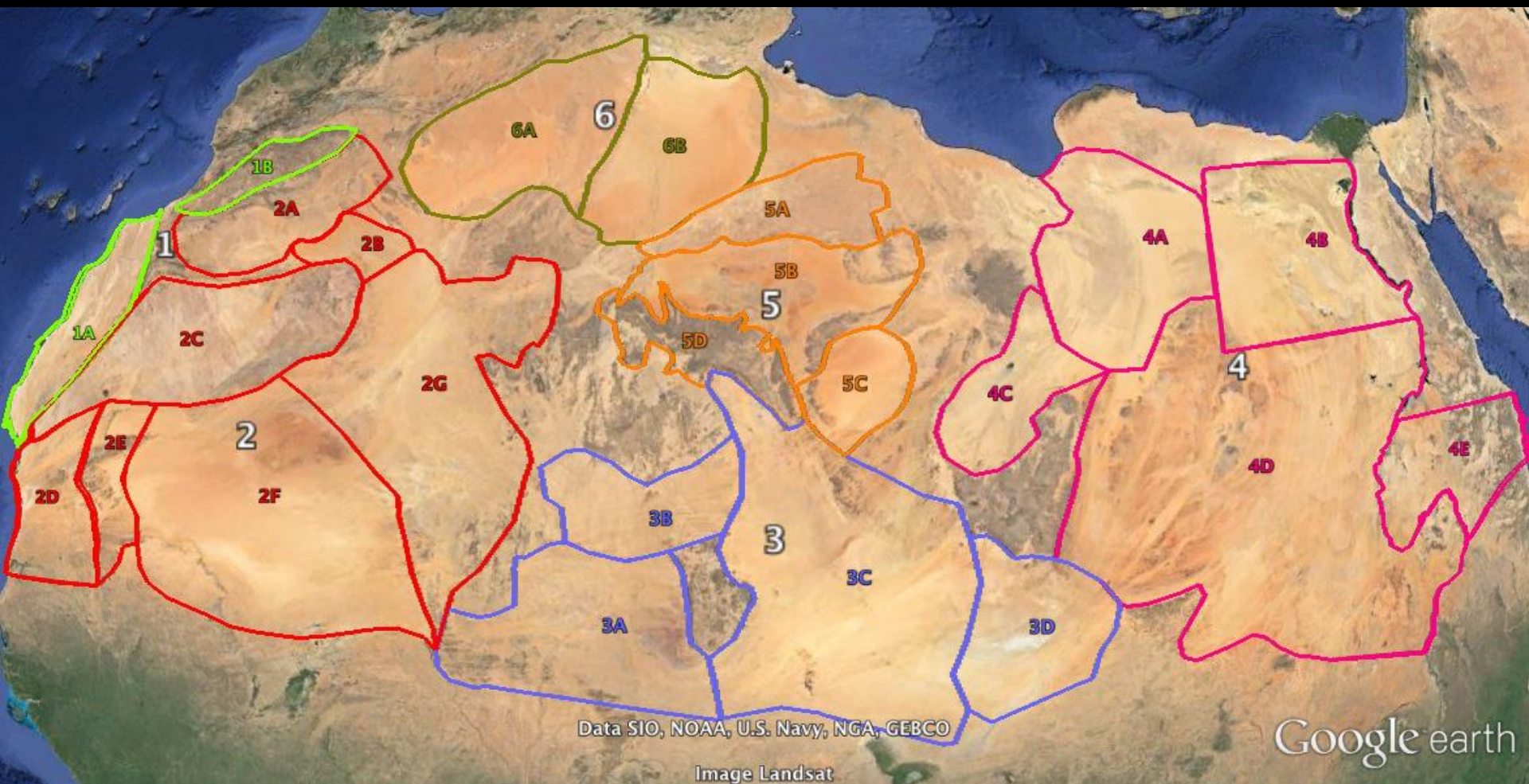
## Identifying Basins





# MISR Technique

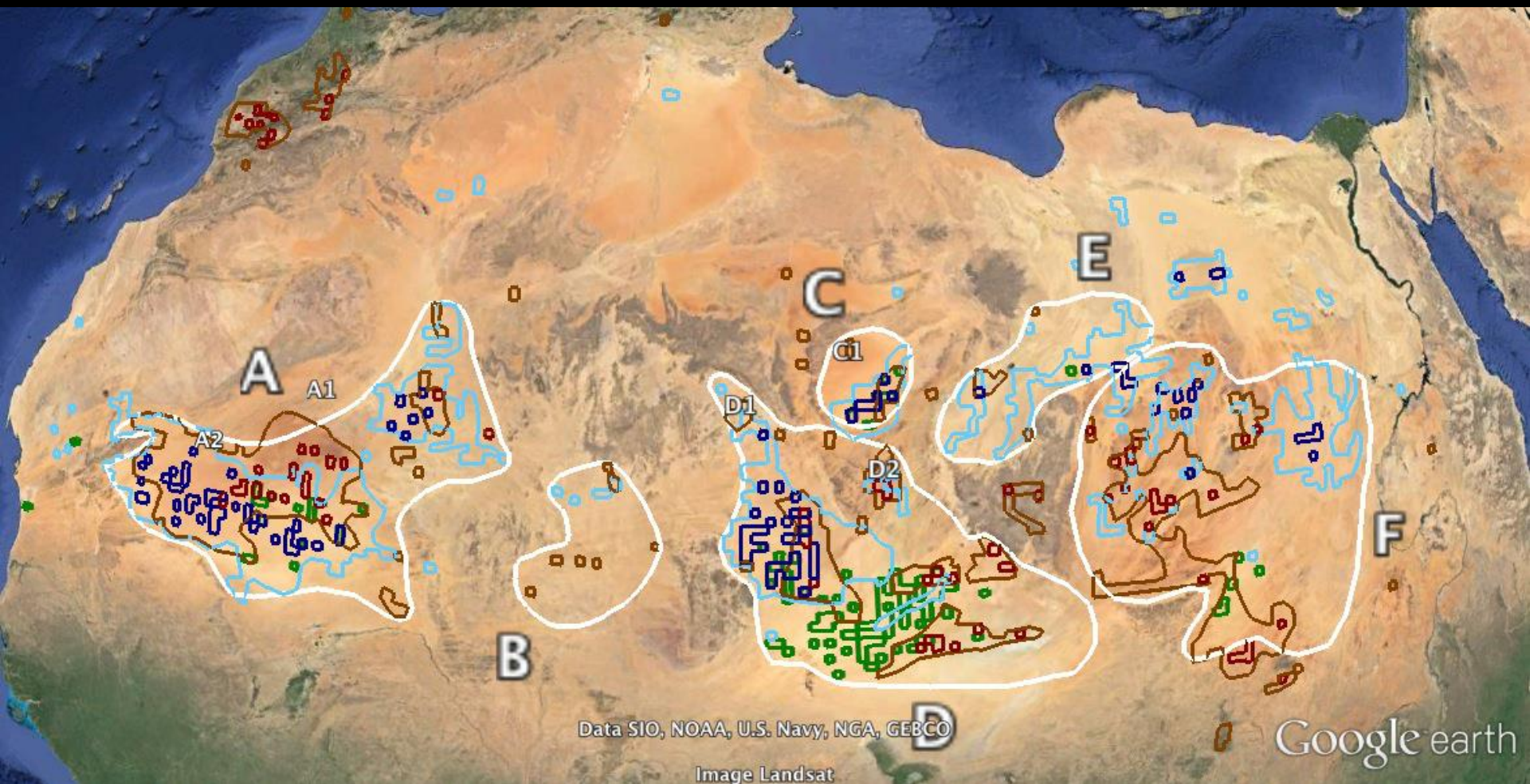
## Identifying Basins





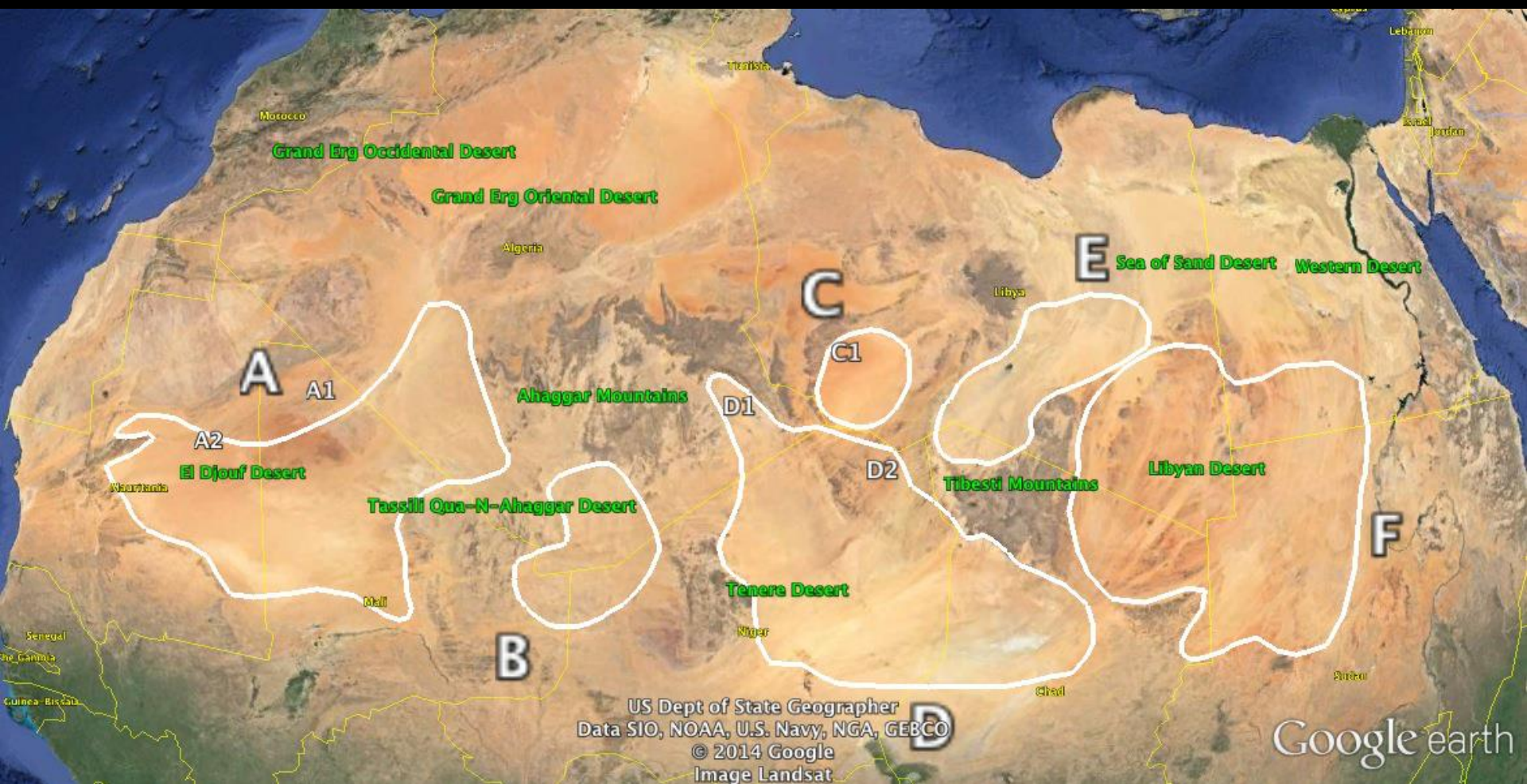
# Results

## Identifying Dust Source Regions





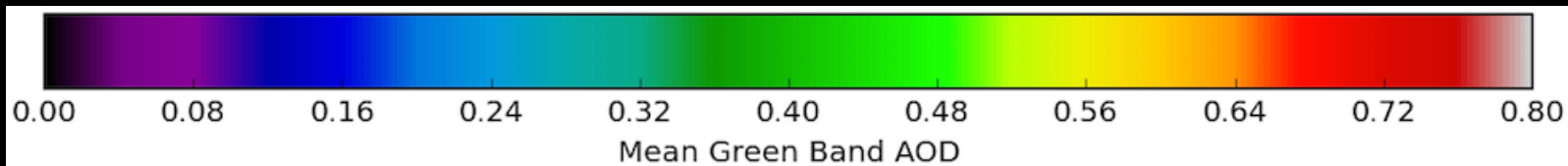
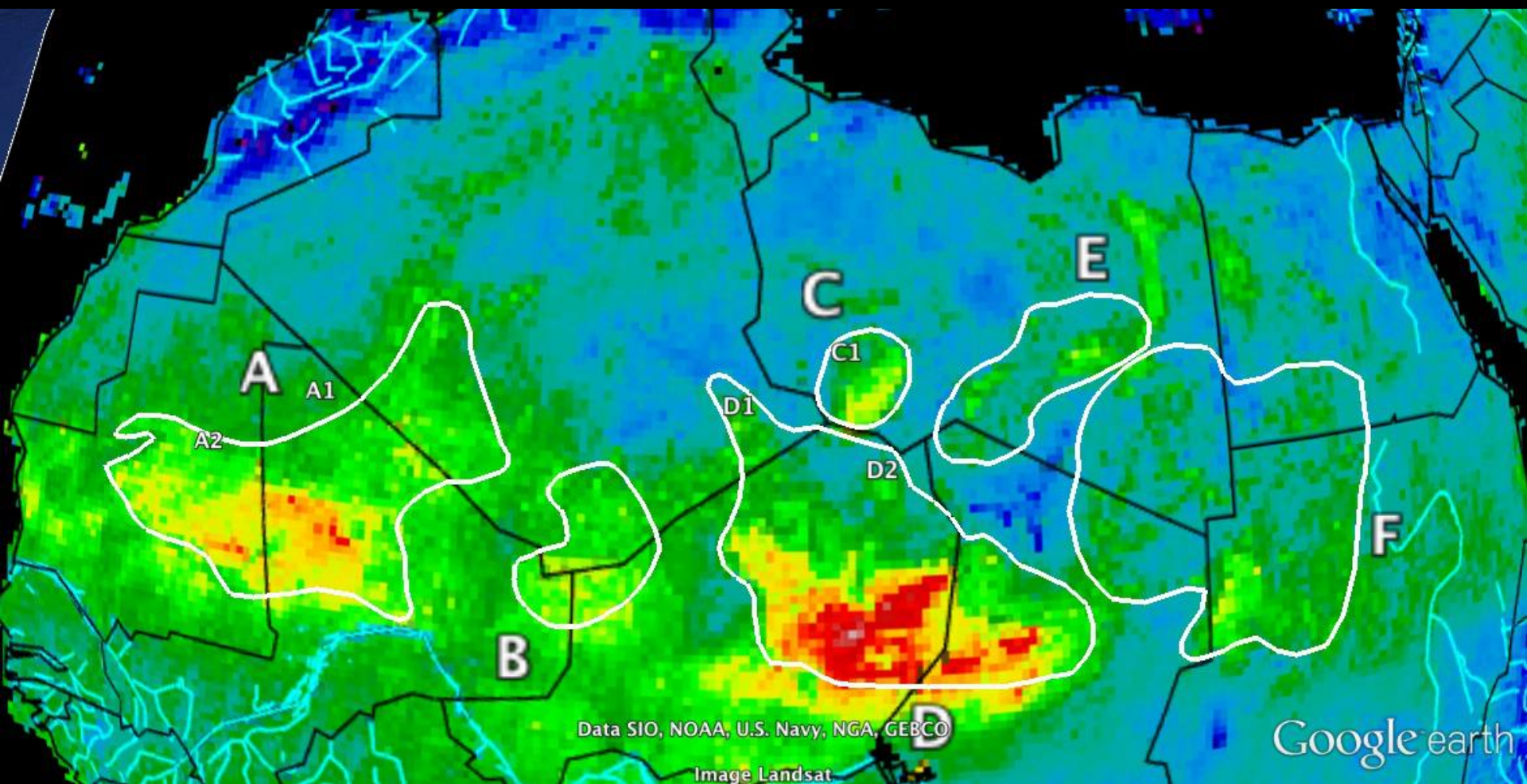
# Identifying Dust Source Regions





# Results

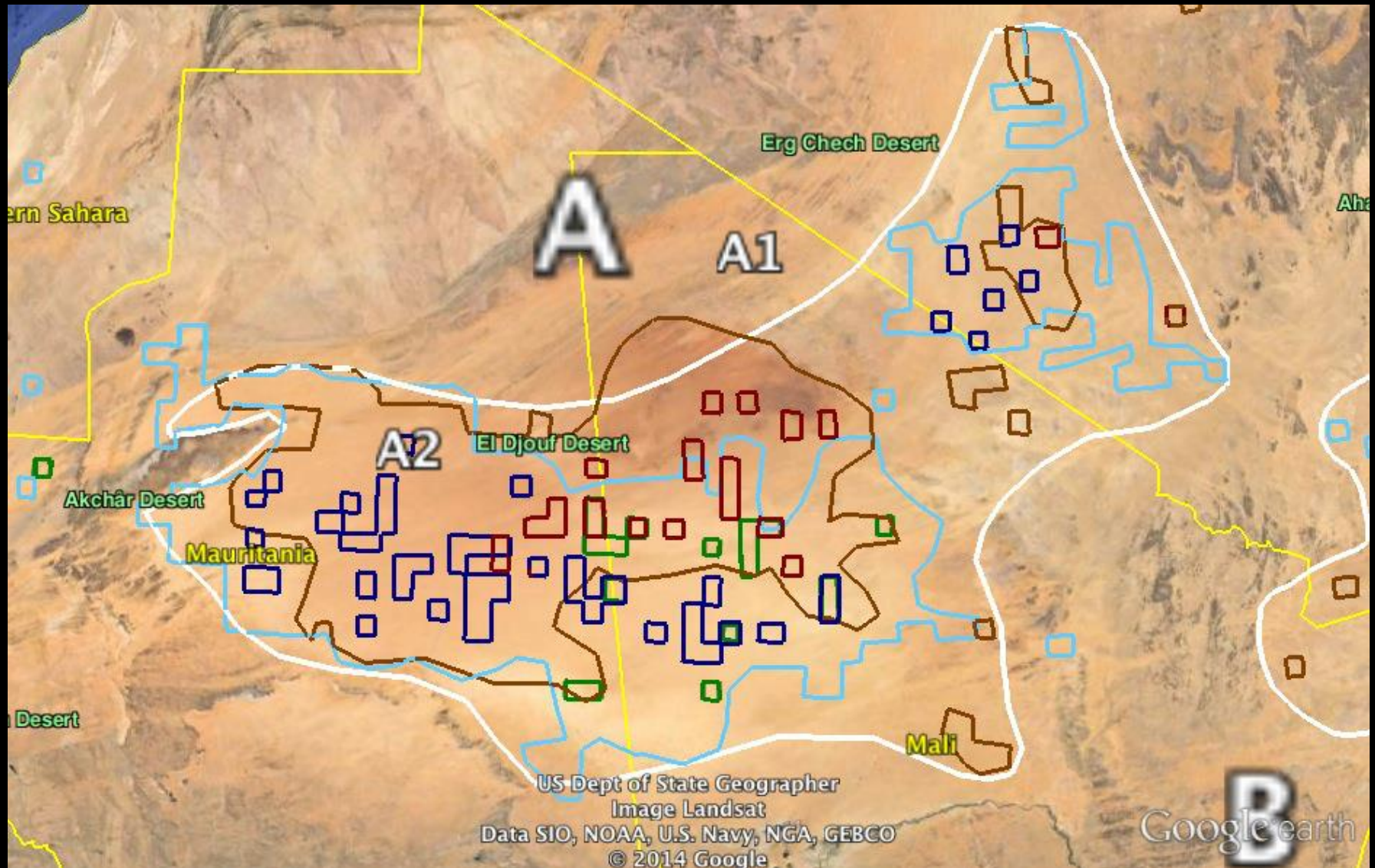
## Identifying Dust Source Regions





# Results

## Identifying Dust Source Regions – Region A



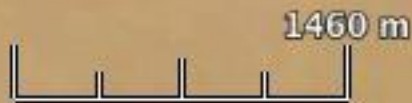


# Results

## Identifying Dust Source Regions – Region A



A1

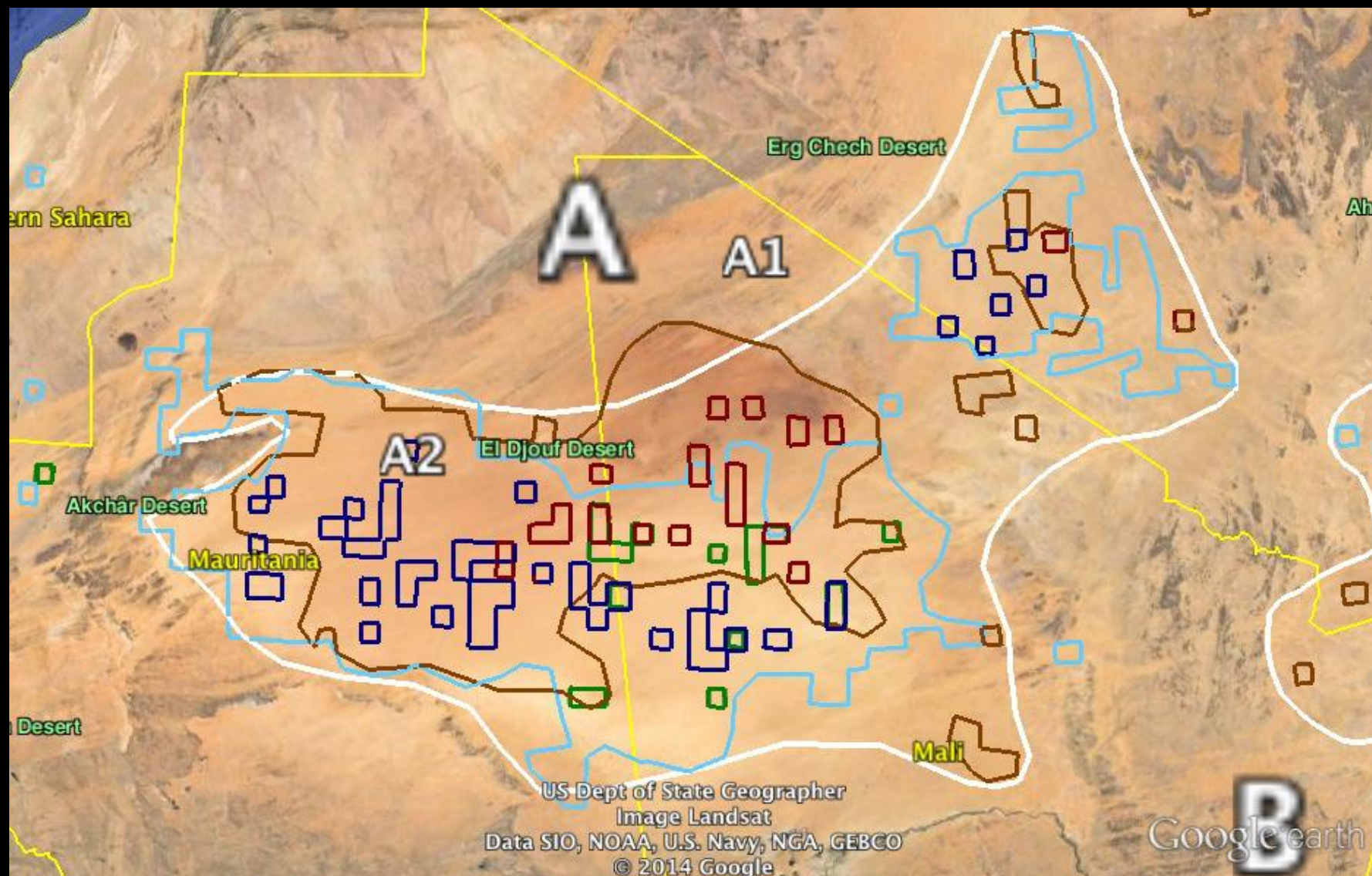


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Google Earth

# Results

## Identifying Dust Source Regions – Region A





# Results

## Identifying Dust Source Regions – Region A



A2

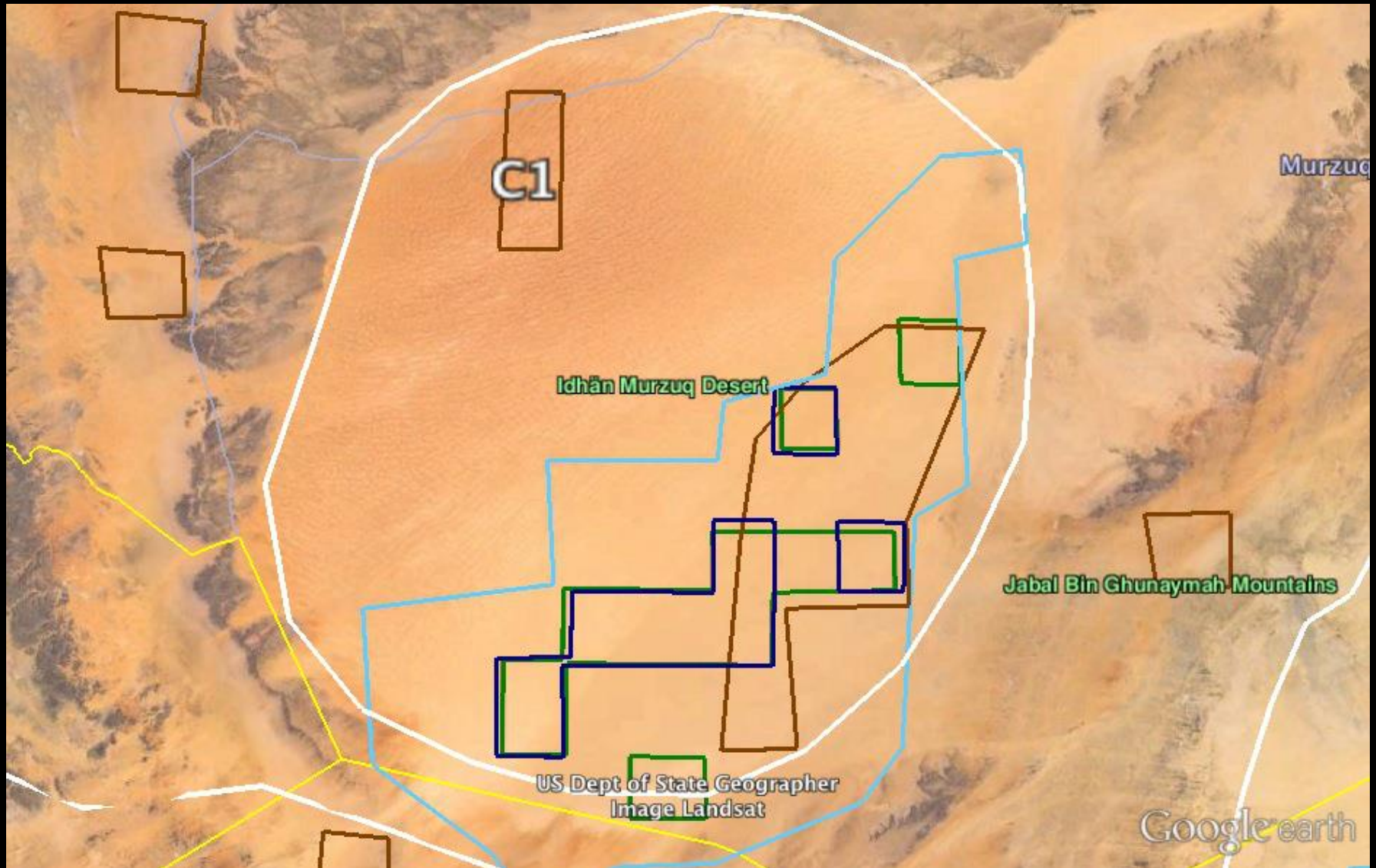


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# Results

## Identifying Dust Source Regions – Region C





# Results

## Identifying Dust Source Regions – Region C



C1



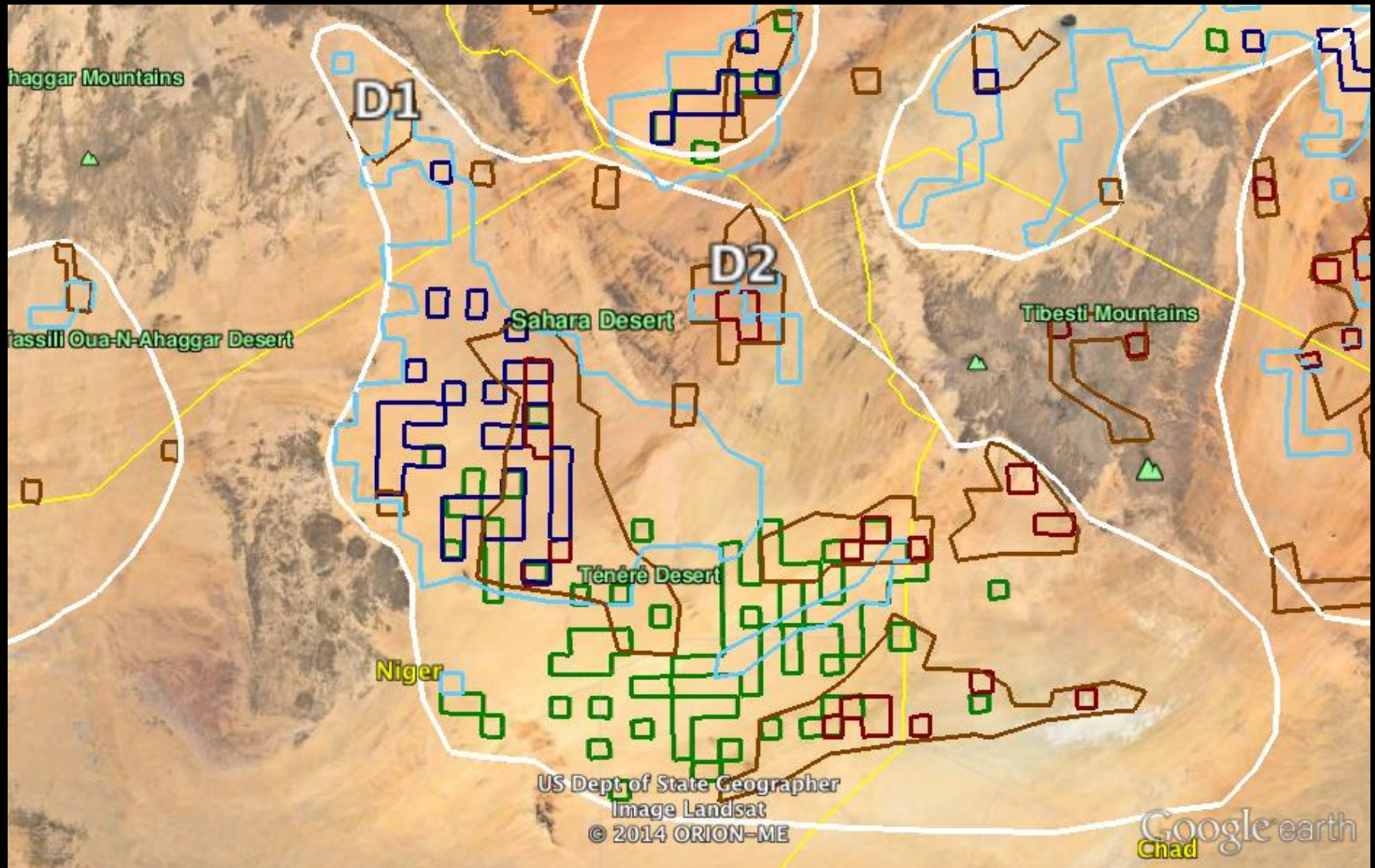
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Google Earth



# Results

## Identifying Dust Source Regions – Region D





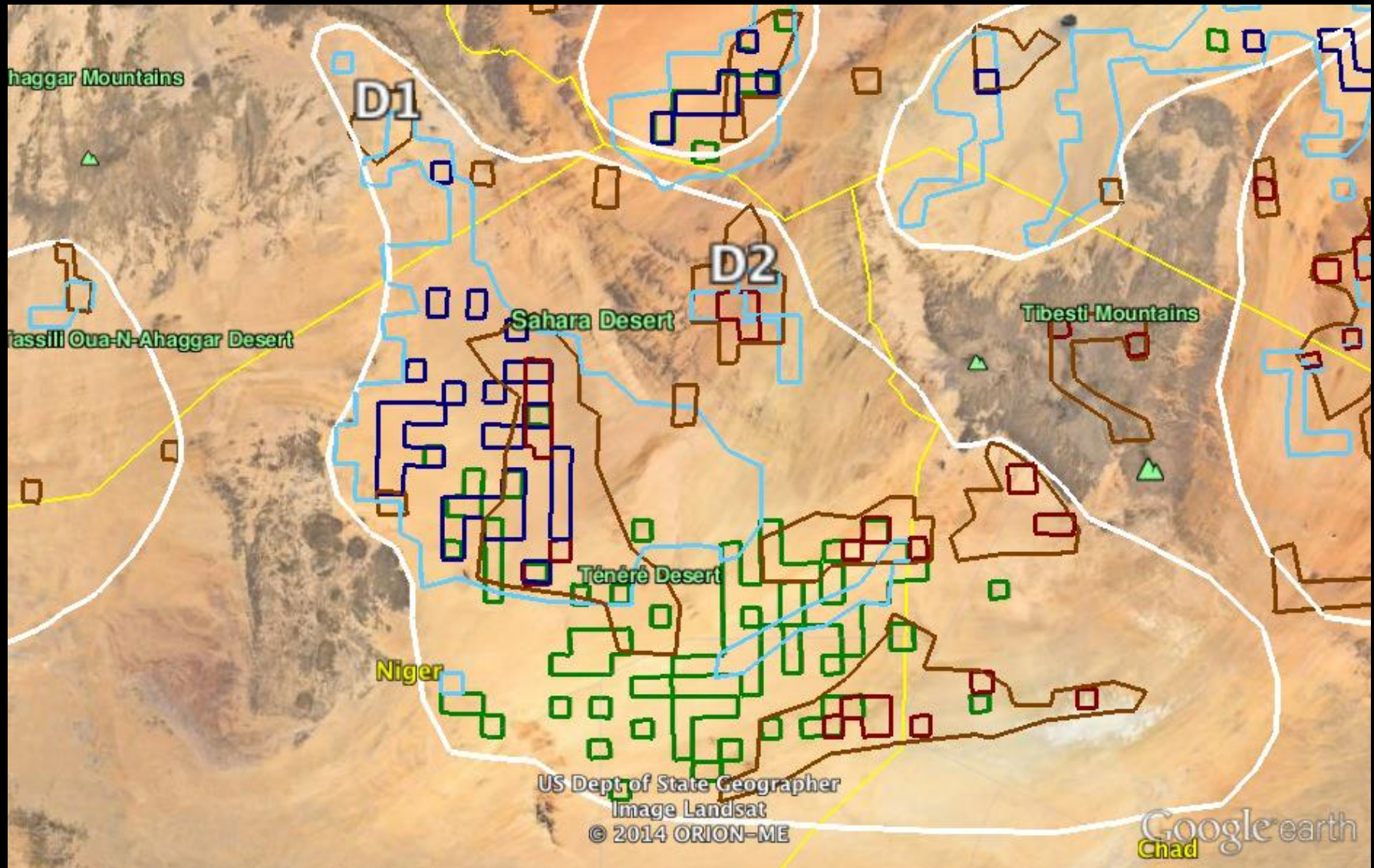
# Results

## Identifying Dust Source Regions – Region D



# Results

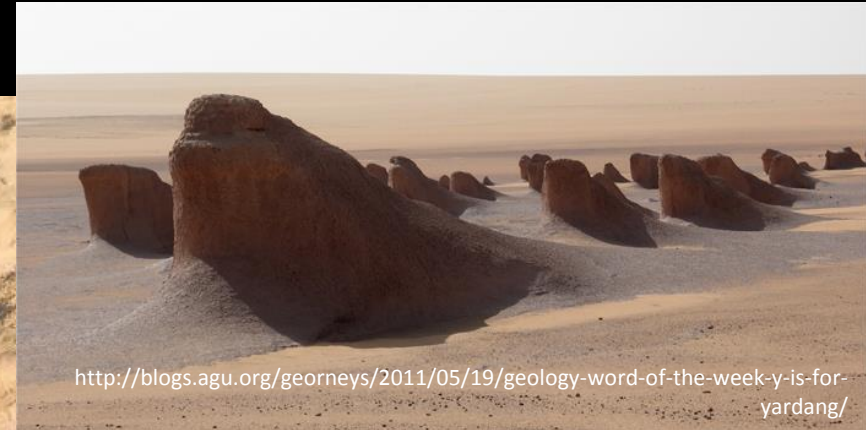
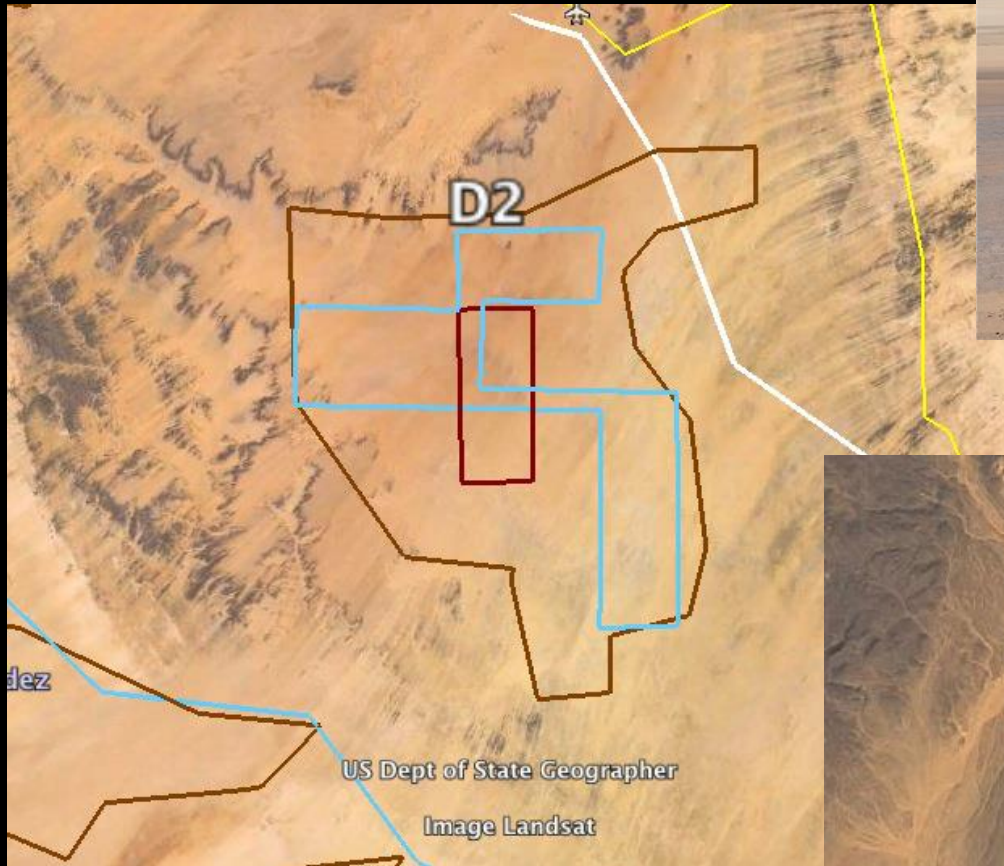
## Identifying Dust Source Regions – Region D





# Results

## Identifying Dust Source Regions – Region D



# Conclusions and Next Steps

- Major dust source regions can be identified in North Africa using MISR cloud-motion winds and aerosol products
- Database was assembled – can be used for future analysis – includes MISR observations information:
  - Locations
  - Area and perimeter
  - Elevations
  - Geomorphology
- Next Steps: Compare MISR technique with other remote sensing techniques



# Acknowledgements

- Thank you Olga Kalashnikova and Michael Garay for their guidance and support.
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# References

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