

Remote sensing in Biosphere Reserves for climate change adaptation and mitigation- an overview

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Educational, Scientific and
Cultural Organization



UK National Committee
of Man and the Biosphere
Programme

Format of the presentation

- Extent of use of remote sensing in WNBR
- Examples of different uses
- Some common problems where RS can be developed

WL: 5000 WW: 10000

21076

4

AL

10000

5000

0

PR

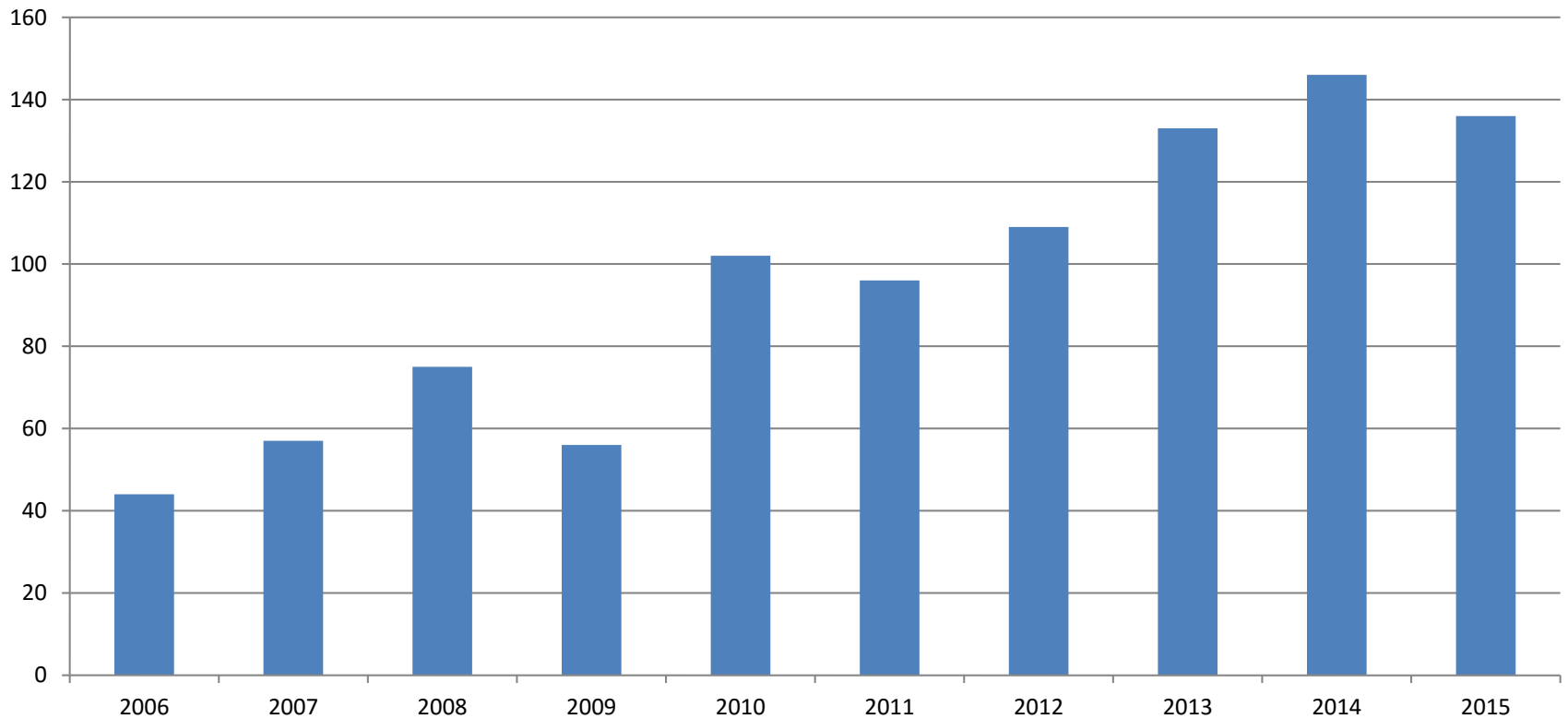
Zoom: 189% Angle: 0

Im: 18/24 L (R → L)

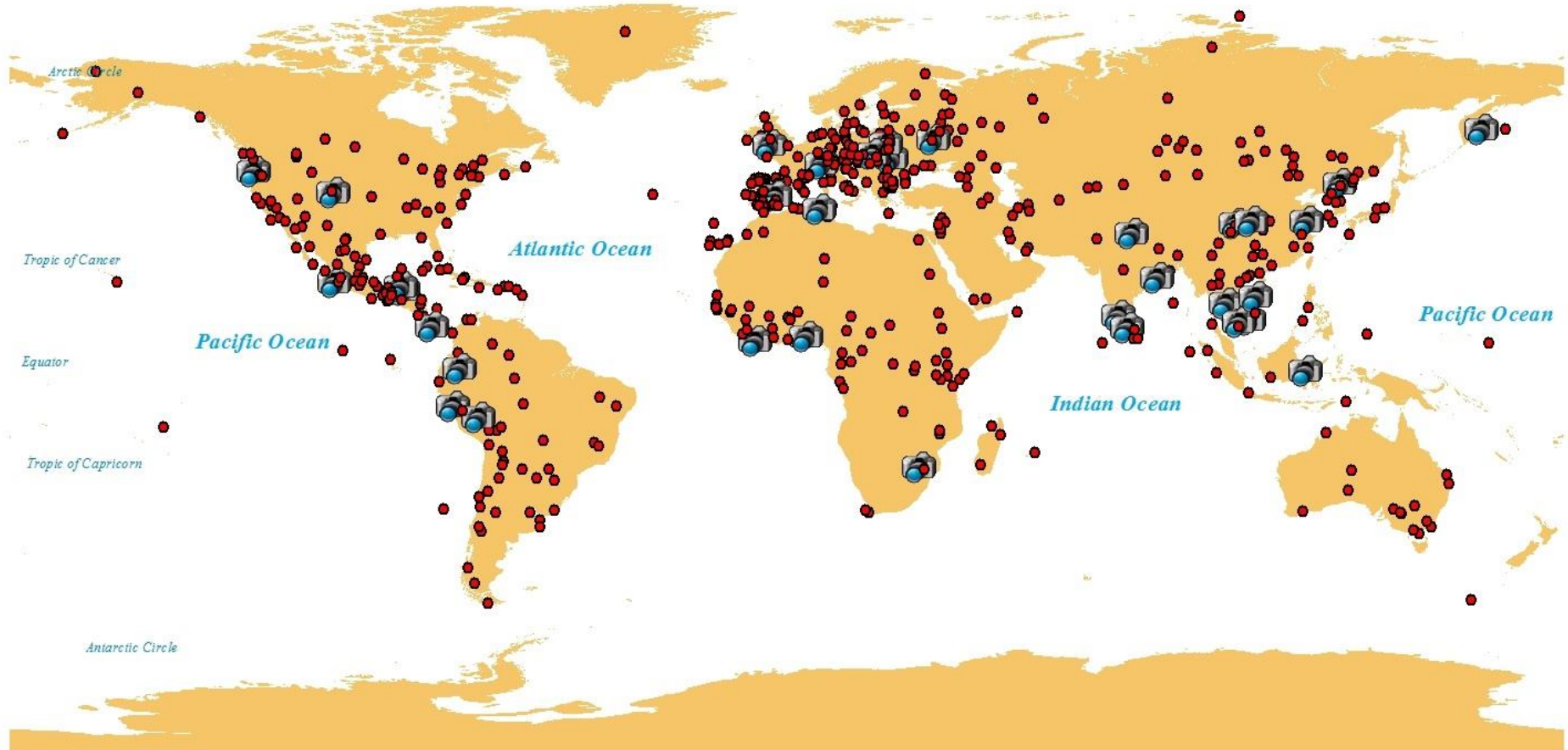
TE: 12 TR: 3098.5

EXTENT OF USE OF RS IN BIOSPHERE RESERVES

Number of publications indicating "remote sensing" and "Biosphere Reserve"



Documented sites published RS work



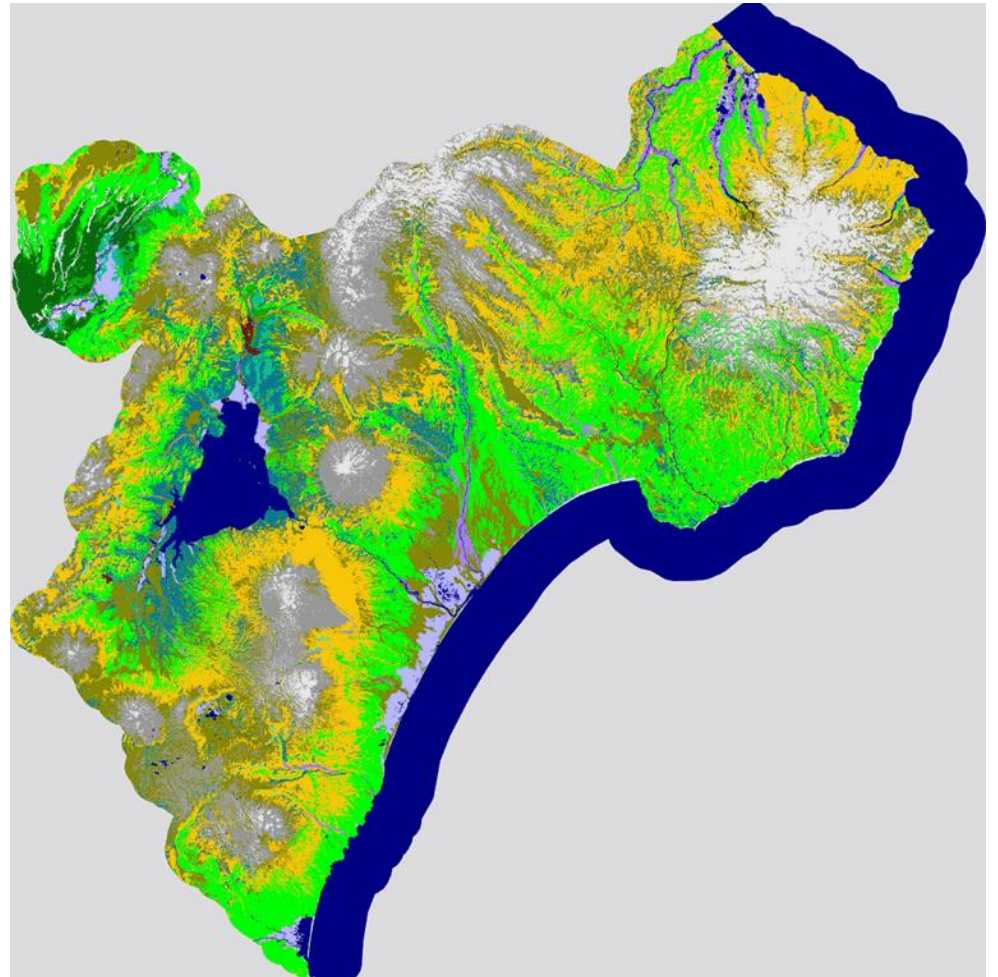
Main uses of RS cited

- Spatial temporal land-cover/land-use change
- Carbon stock assessments
- Rate of change of glacier coverage
- Disaster prediction (glacier lake failure)
- Adaptation design

VEGETATION MAPPING

Kronotsky Reserve

- Multispec Imagery
- Neural network for classification from 225 neurons to 17 vegetation classes.
- (Ergorov et al, 2006)

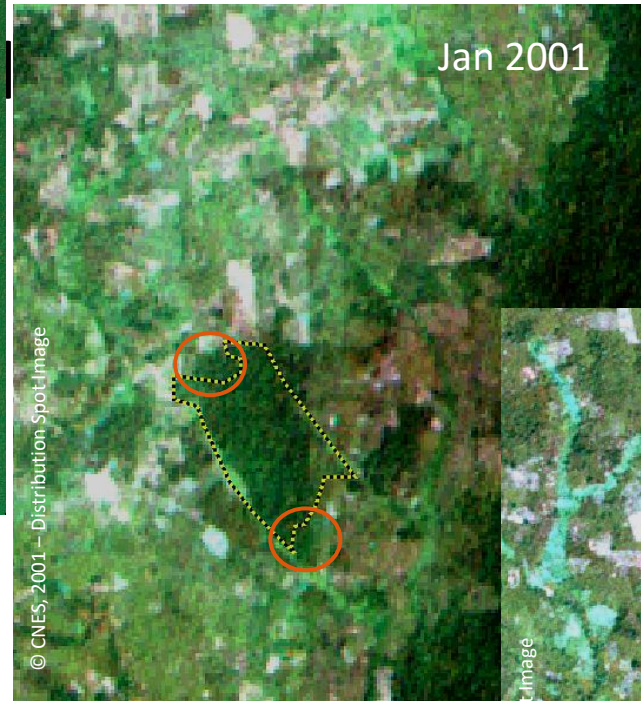


CARBON STOCK ASSESSMENT

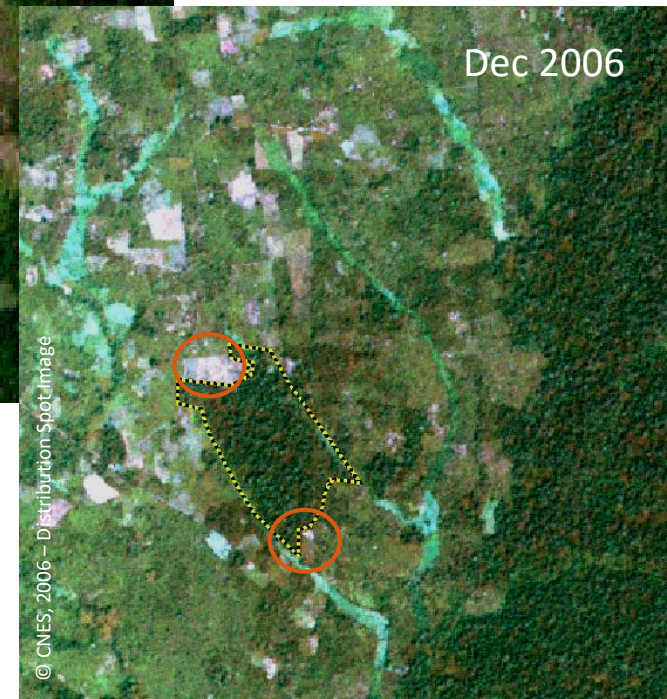
Ivory Coast, Taï National Park



**Forest Protected area
(extract)**



Studies on going

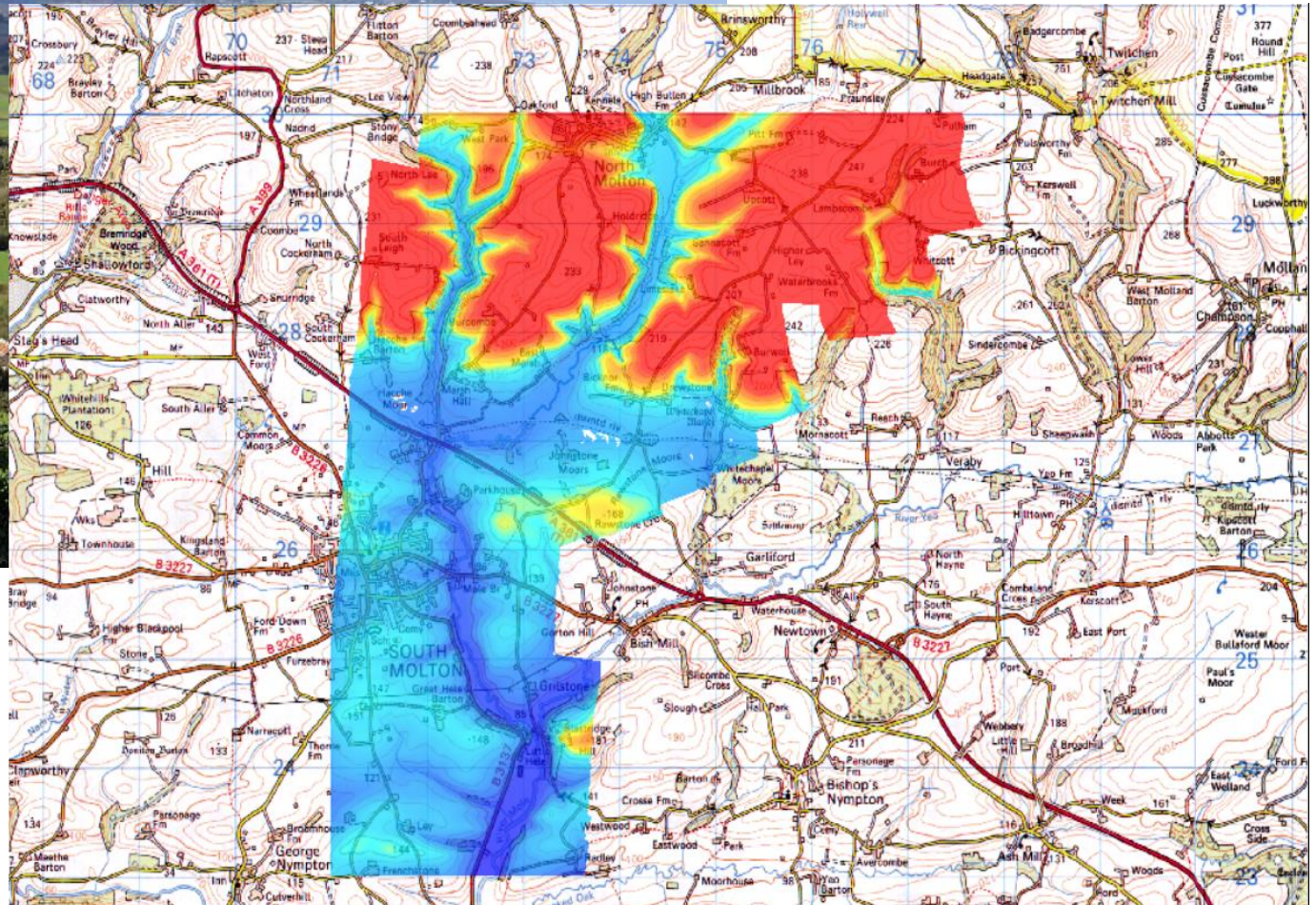


- ⊙ 2001 & 2006 land use maps
- ⊙ Evolution map

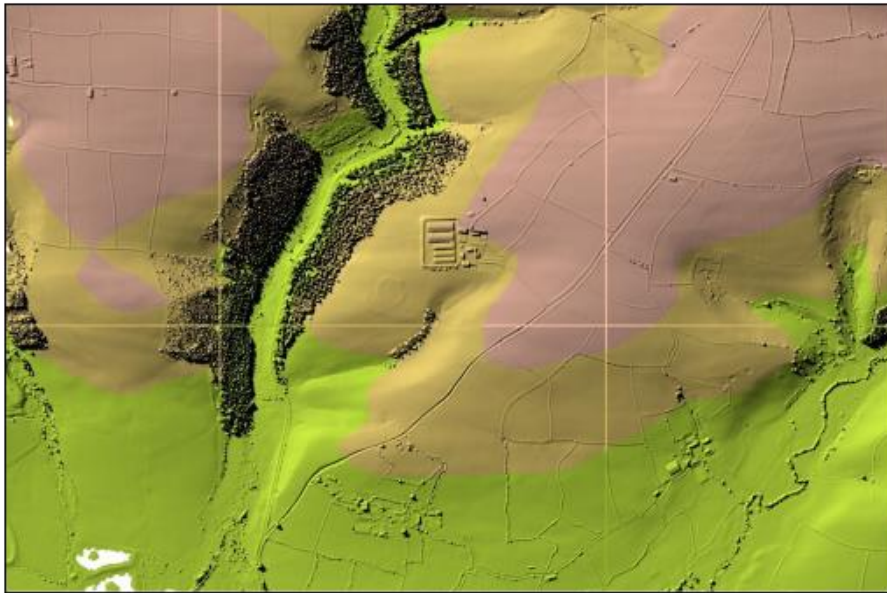
© Spot Image 2006

Deforestation and fragmentation

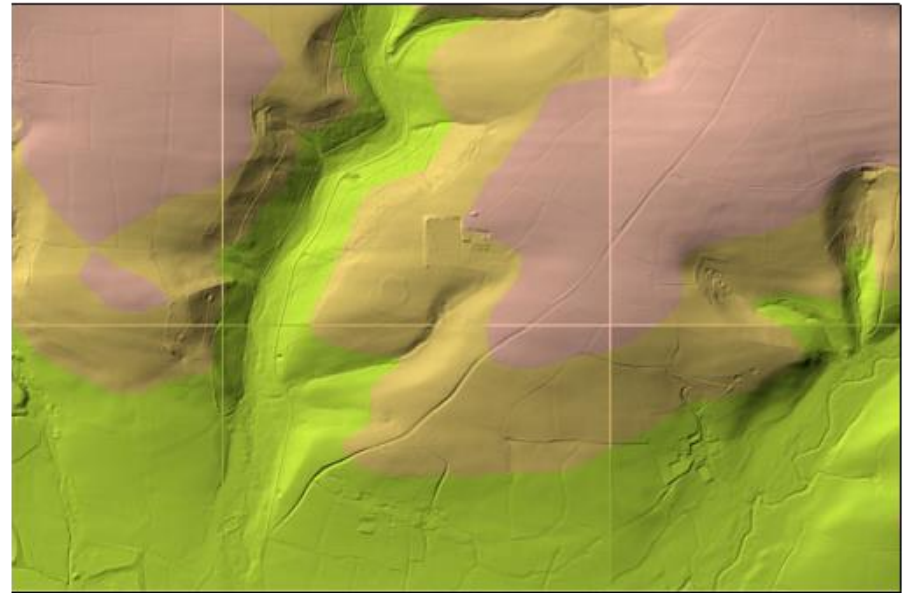
North Devon



North Devon



0 0.1 0.2 0.4 0.6 0.8
Kilometers



0 0.1 0.2 0.4 0.6 0.8
Kilometers

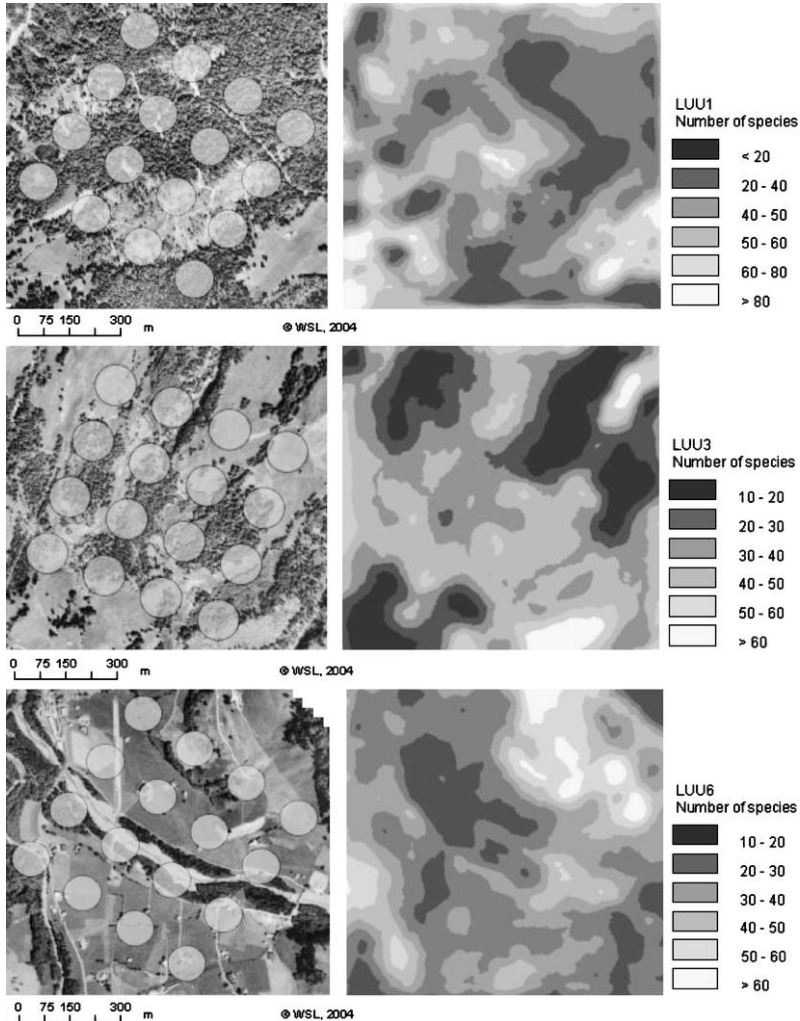


Legend: Hedges by classification

0	(554)
1	(720)
2	(496)
3	(239)
4	(71)
5	(50)
6	(3)
Zero	(383)

PREDICTING CHANGE FOR SPECIES

- Predicting lichen species change with land-use change



Source; LT Waser et al 2007

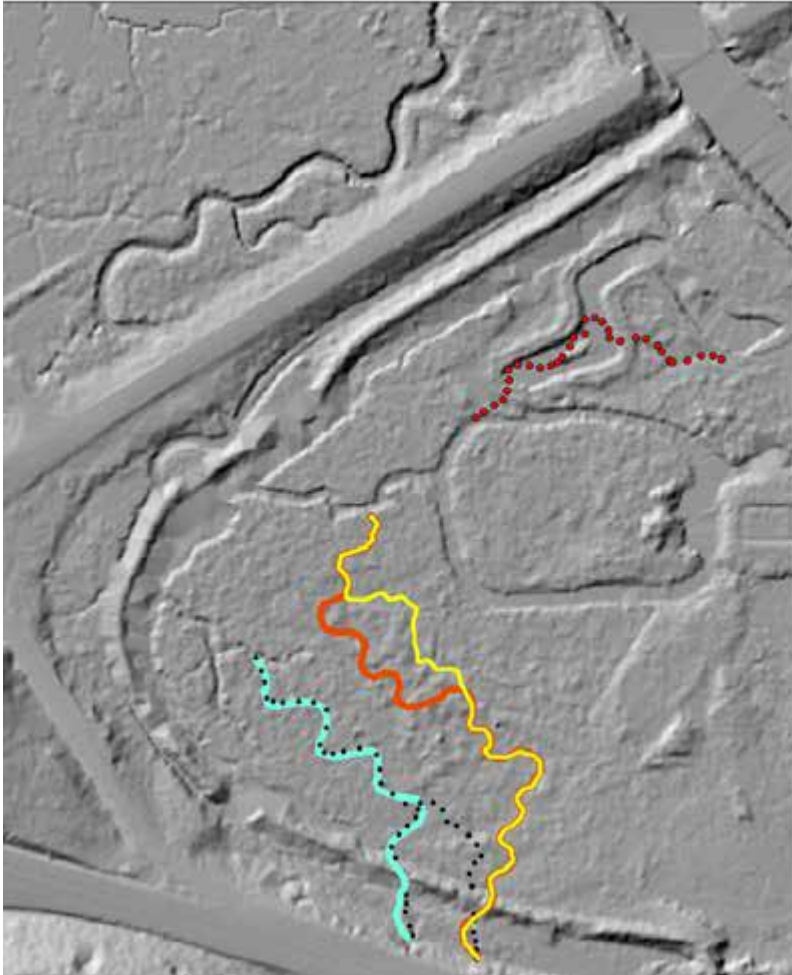
COASTAL ADAPTATION



LiDAR for volumetric change analysis



Cascade Head, USA



- Lidar has been used to map the estuary basin.
- The data has been used to support the design of new intertidal wetlands to restore habitats lost through coastal squeeze.

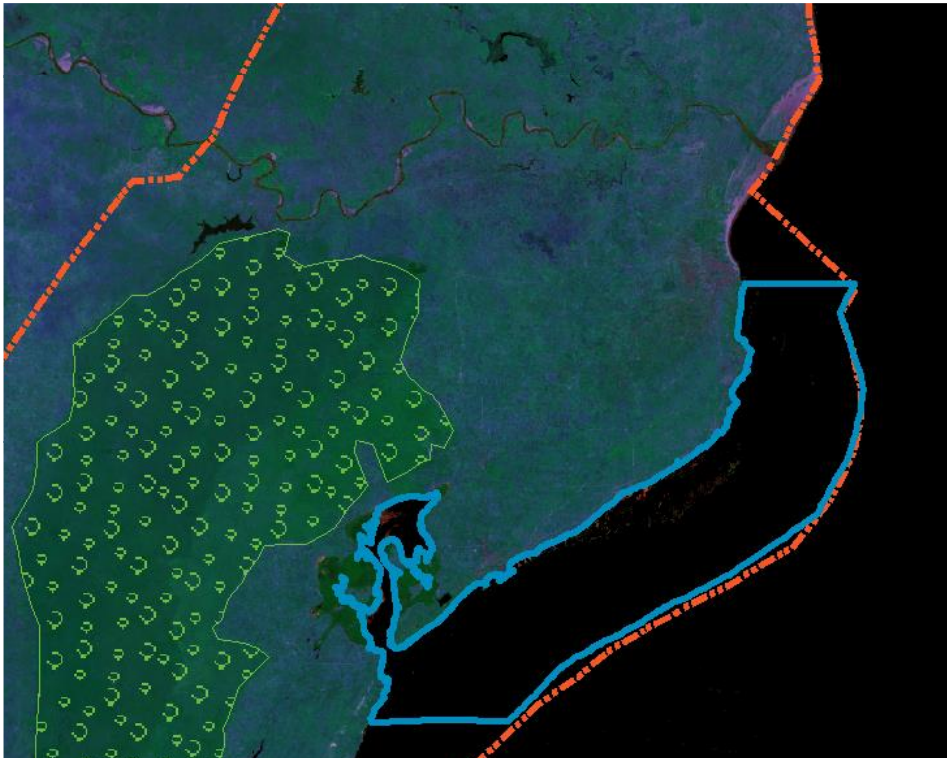
Trends and Observations

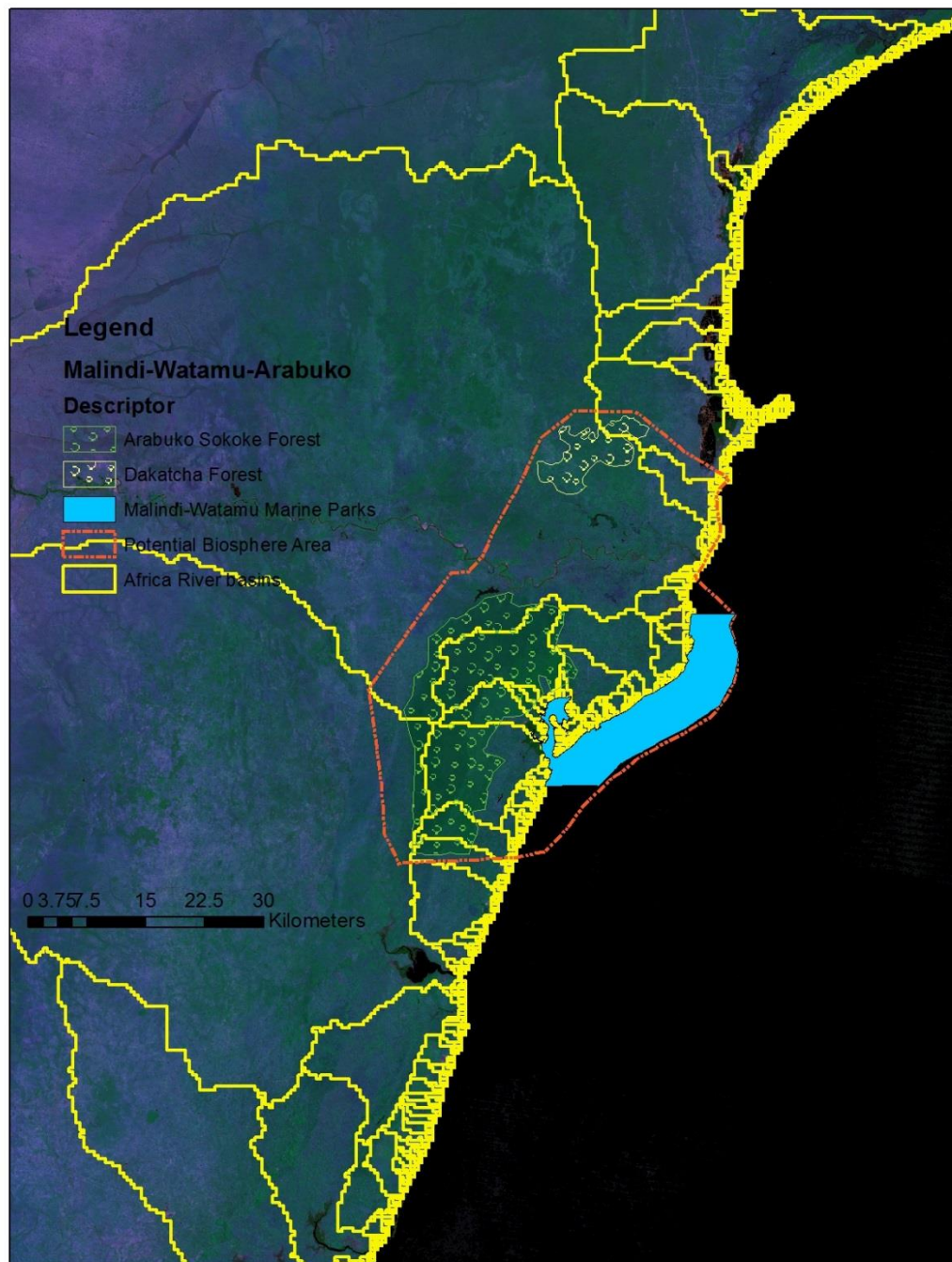
- Not many Biosphere Reserves are ostensibly using RS to support decision making
 - Reasons?
- Open source data is used most.
- The demand for higher resolution data is ever present. 30cm aerial images, QB, v Landsat 30m.
- Increase use in airborne platforms (LiDAR, Aerial Photography)

Future

- Biosphere Reserves as testing sites.
 - Good ground truthing, etc
- More sources and blended data sources?
 - Combined satellite and airborne data.
- Capacity support needed in the BRs.
- Development areas on hydrology and water/coastal resources possibly needed.
- Geo-database for all the Biosphere Reserves

Marine and terrestrial combined





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THANK YOU FOR LISTENING