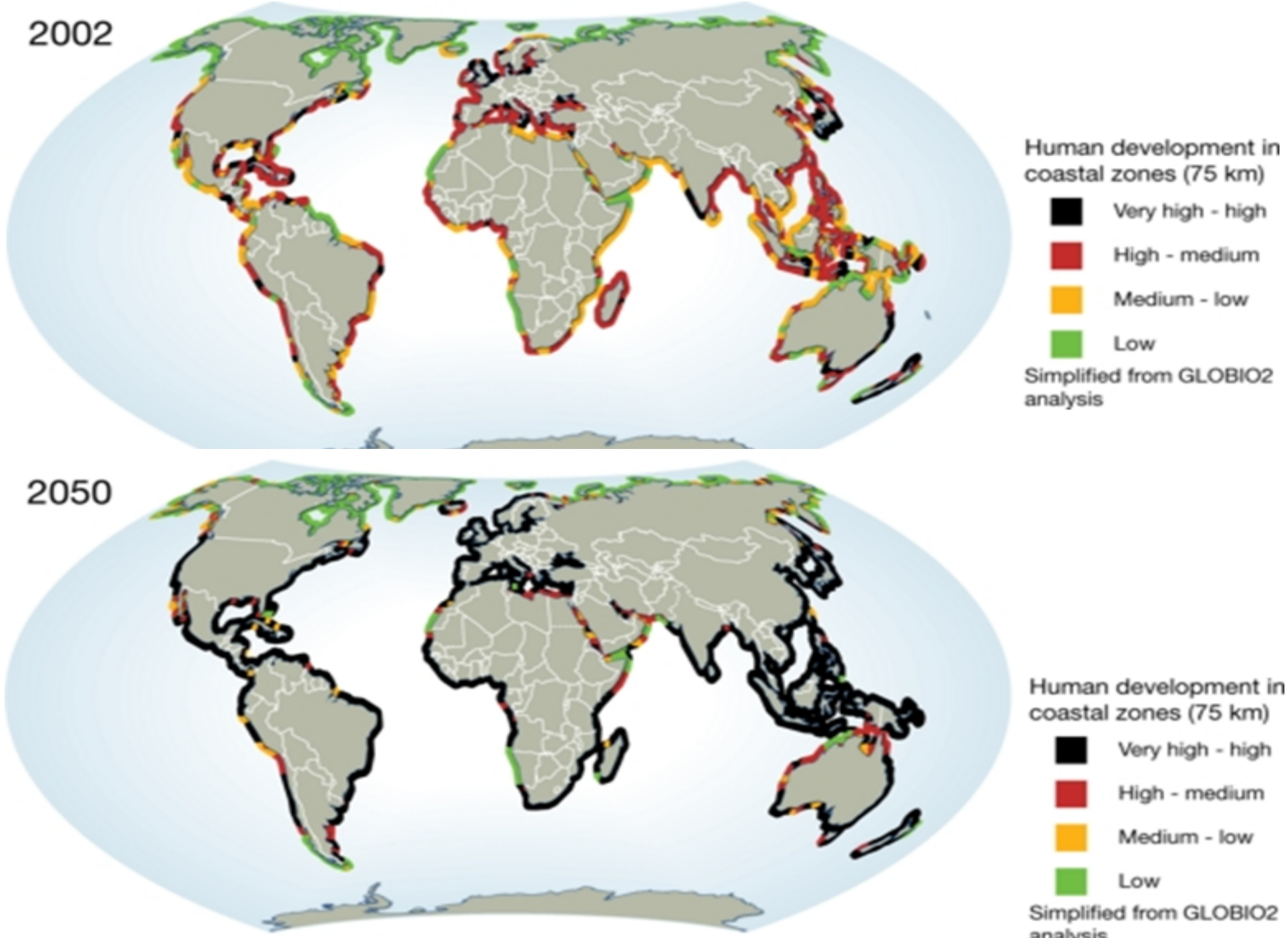
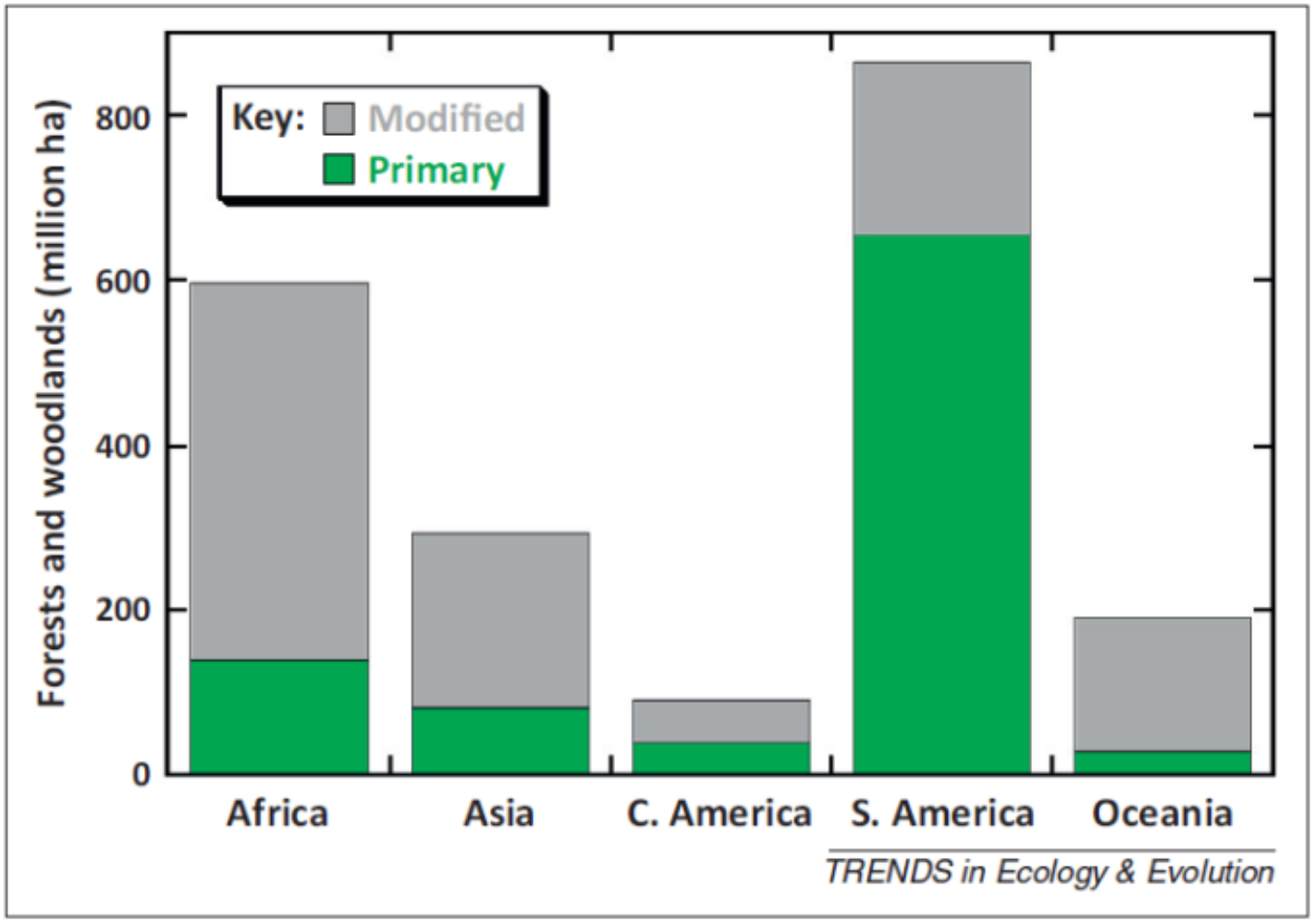
# To log or to protect? Ridge to reef planning on Kolombangara Island

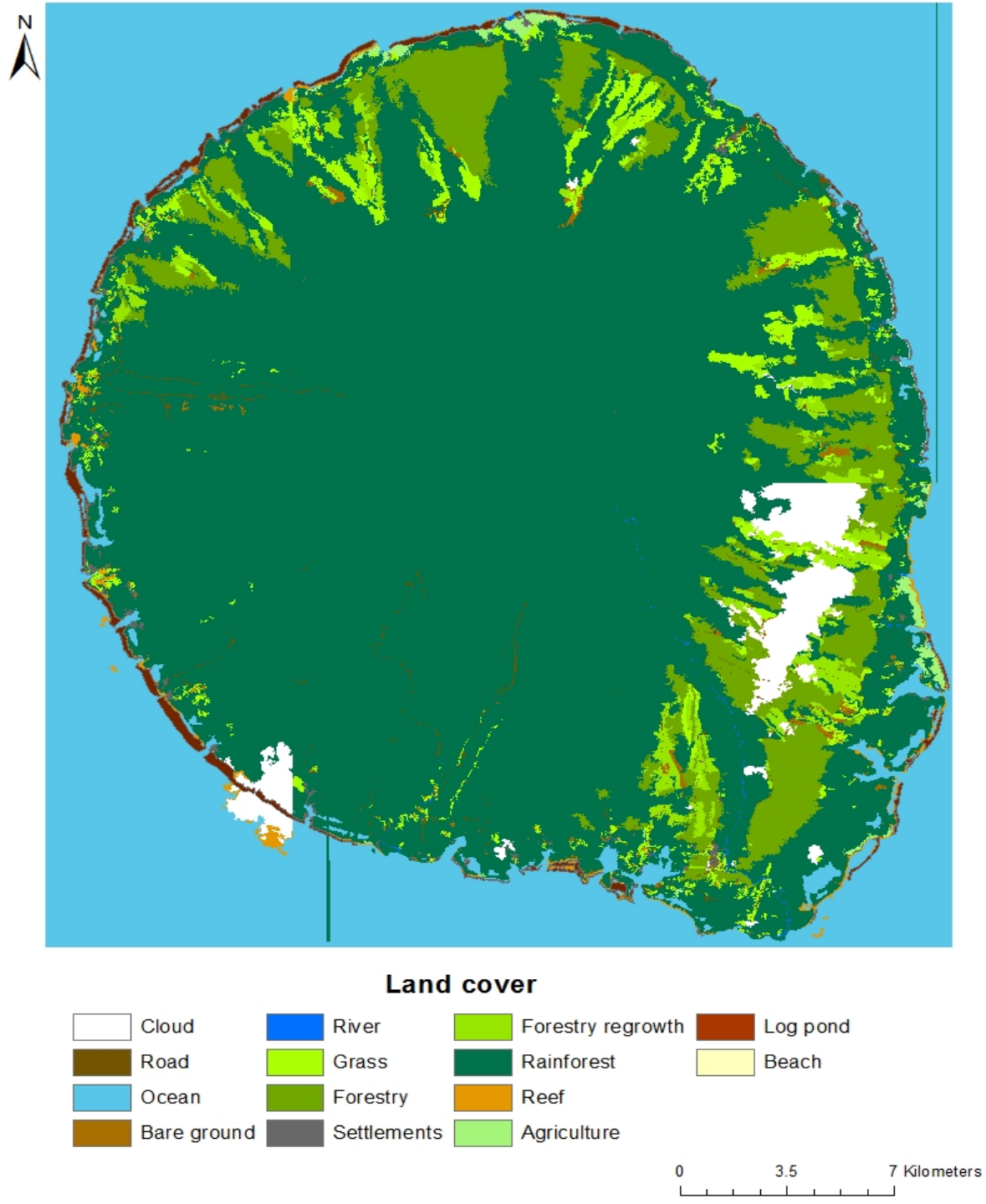
Amelia Wenger, Scott Atkinson, Kim Falsinki, Stacy Jupiter

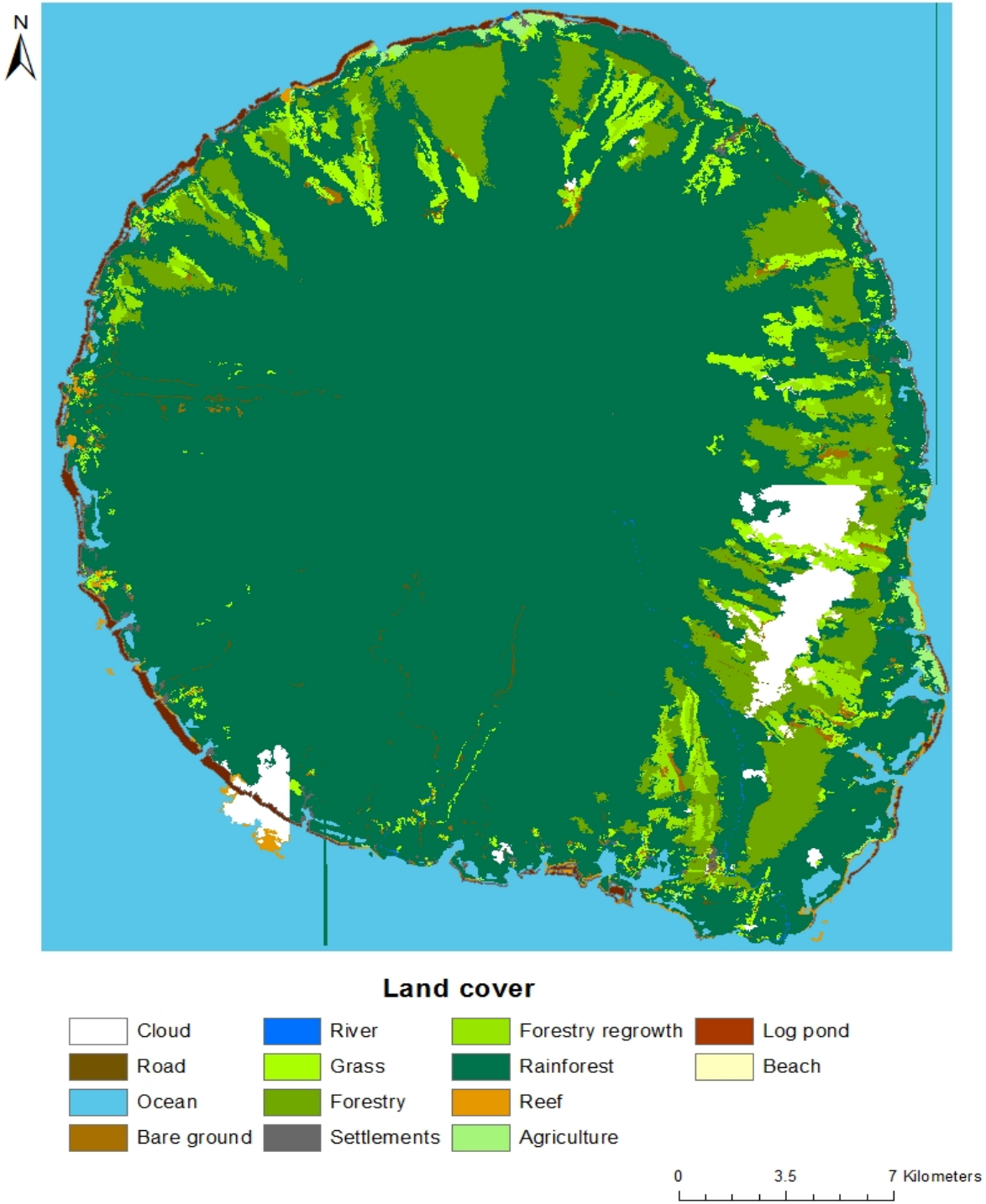

2002
Human development in coastal zones (75 km)
Very high - high
High - medium
Medium - low
Low
Simplified from GLOBIO2 analysis
2050
Human development in coastal zones (75 km)
Very high - high
High - medium
Medium - low
Low
Simplified from GLOBIO2 analysis




Laurance et al. 2014

Stacy Jupiter



N
Land cover
Cloud
River
Forestry regrowth
Log pond
Road
Grass
Rainforest
Beach
Ocean
Forestry
Reef
Bare ground
Settlements
Agriculture
0
3.5
7 Kilometers


N
Land cover
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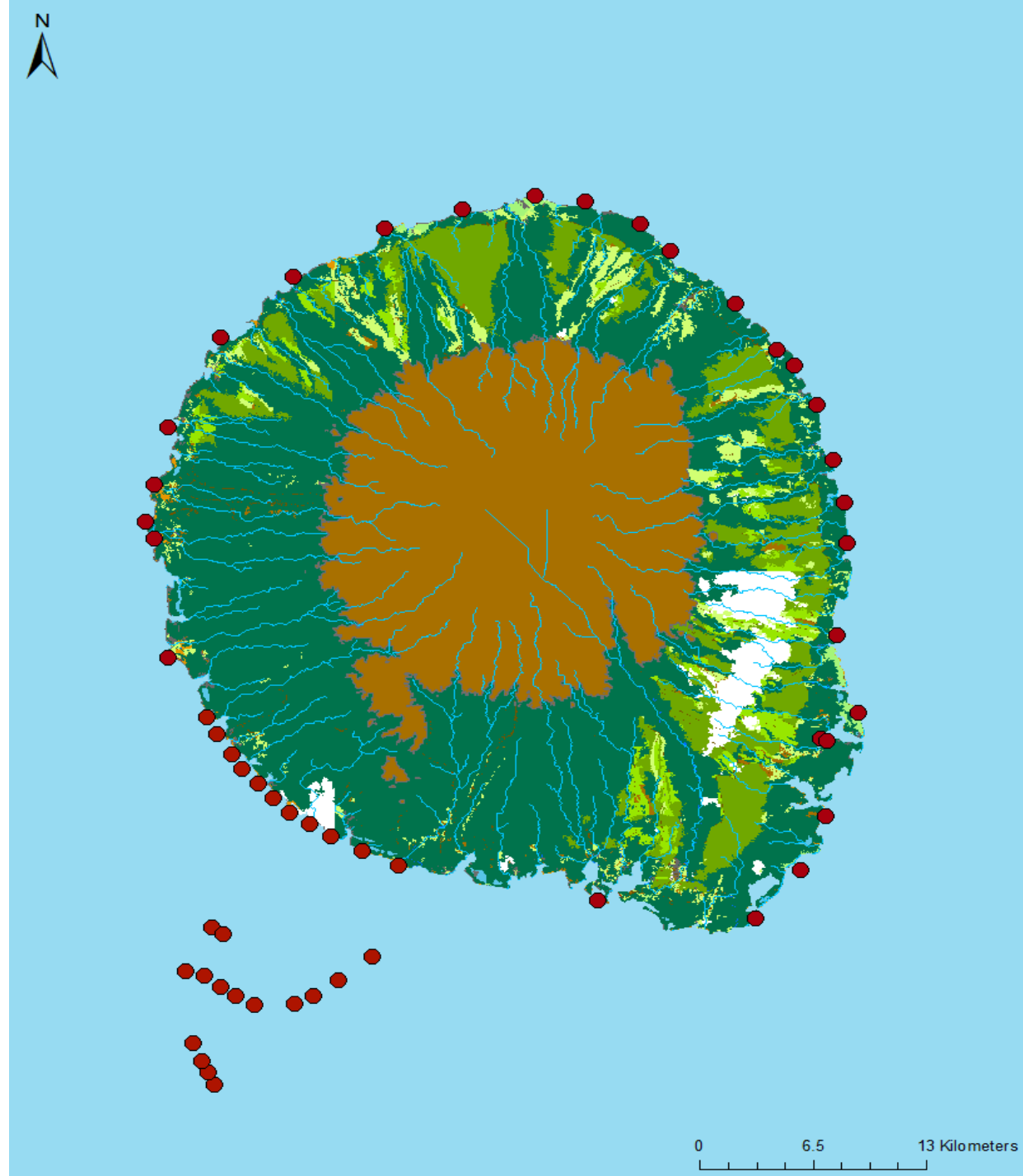
Grass
Rainforest
Beach
Ocean
Forestry
Reef
Bare ground
Settlements
Agriculture
0
3.5
7 Kilometers


N
0
6.5
13 Kilometers

SOLOMON ISLANDS
GOVERNMENT

FIJI FOREST HARVESTING
**CODE OF PRACTICE**

The Revised
**Solomon Islands**
**Code of Logging Practice**

# Limitations of logging codes of practice

- Soil erodibility not considered as an important risk factor to consider in planning of clearing activities
- Unclear how well mitigation strategies work as clearing extent increases
- No information on how to assess potential impact to downstream resources

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- Cannot properly consider trade-offs between short and long-term land-use plans
- Unclear how well mitigation strategies work as clearing extent increases
- No information on how to assess potential impact to downstream resources

# Limitations of logging codes of practice

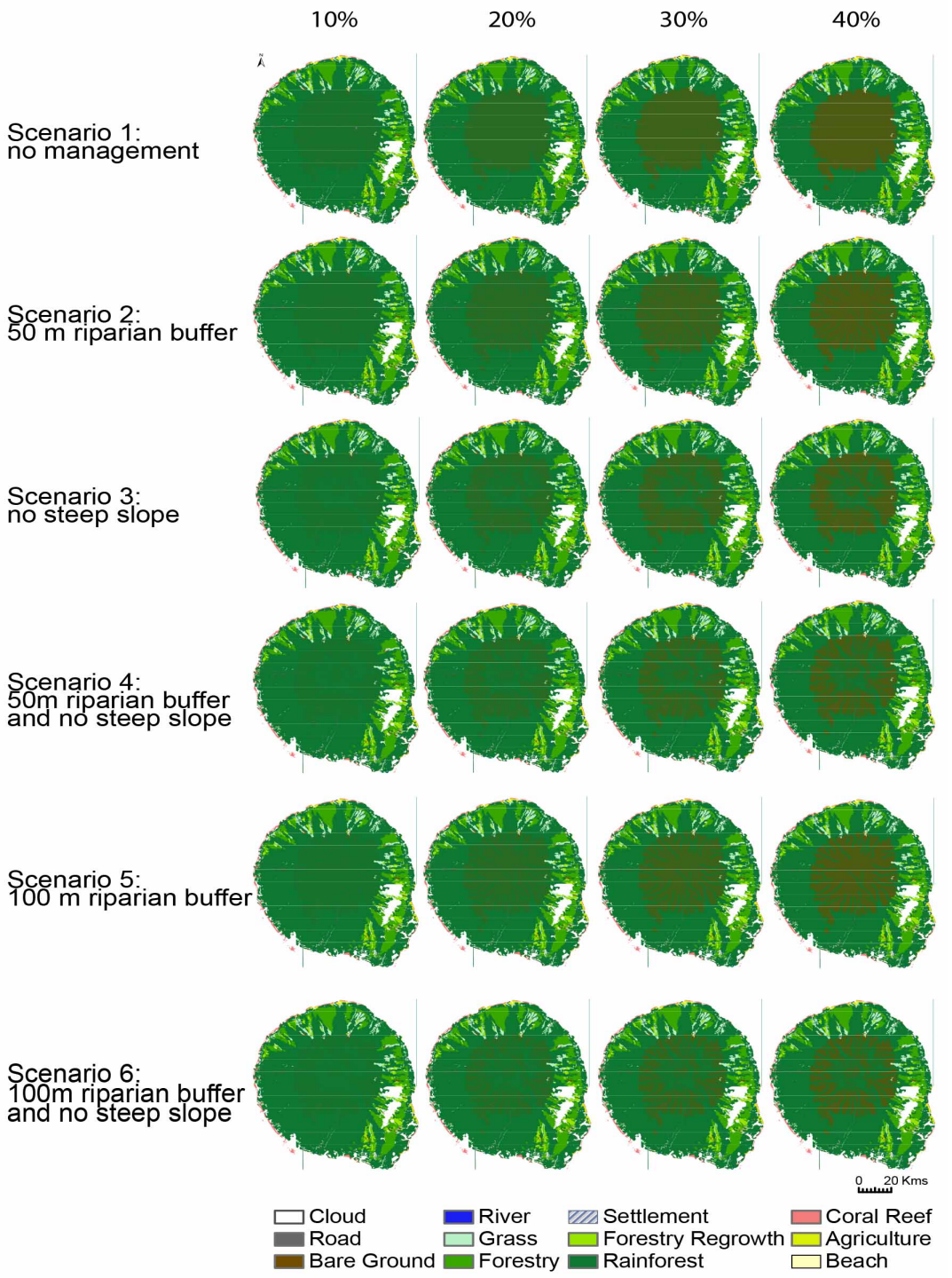
- Cannot properly consider trade-offs between short and long-term land-use plans
- can undermine decision-making around how much development activity can occur before ecosystem services are unduly impacted
- No information on how to assess potential impact to downstream resources

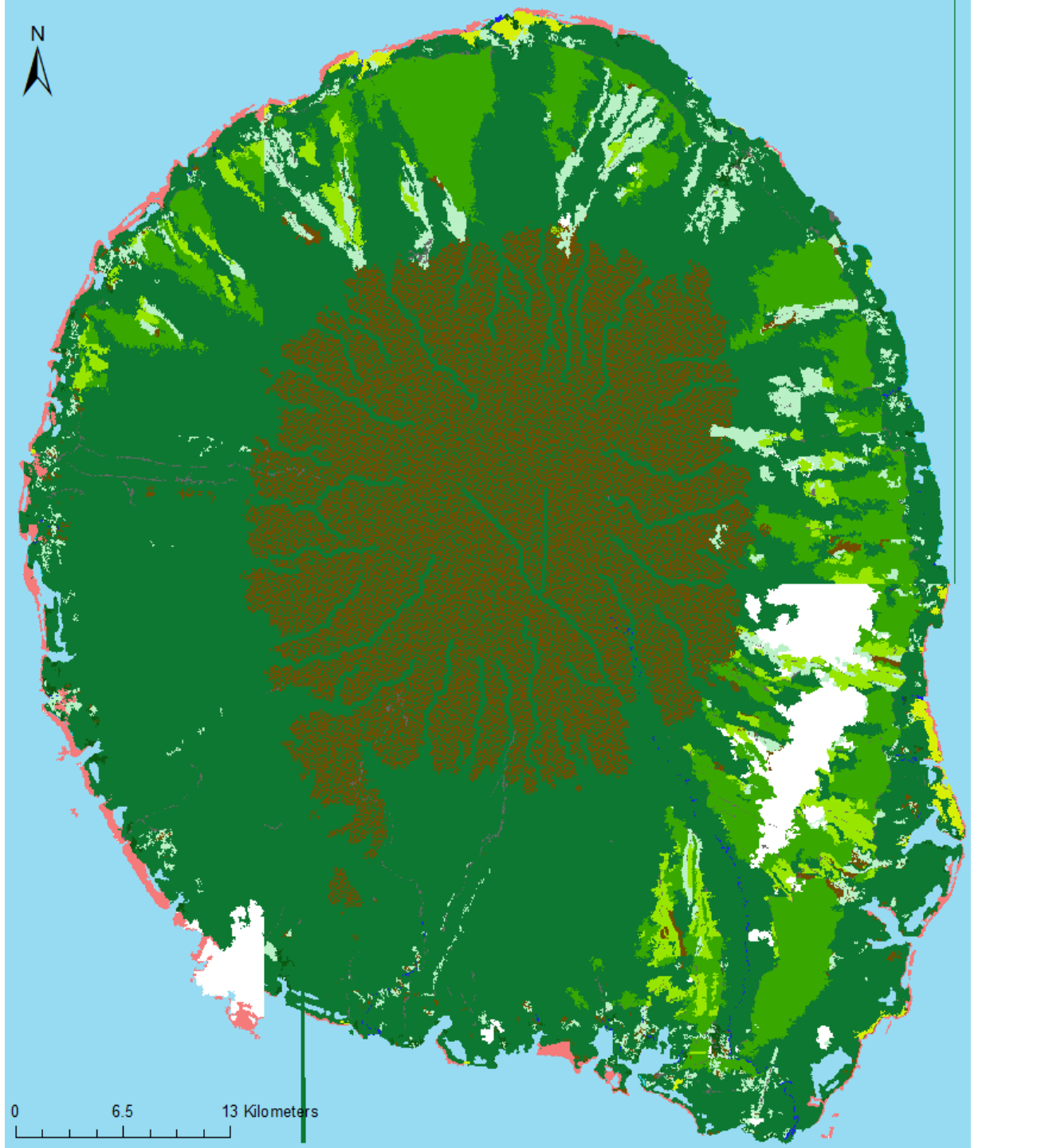
# Limitations of logging codes of practice

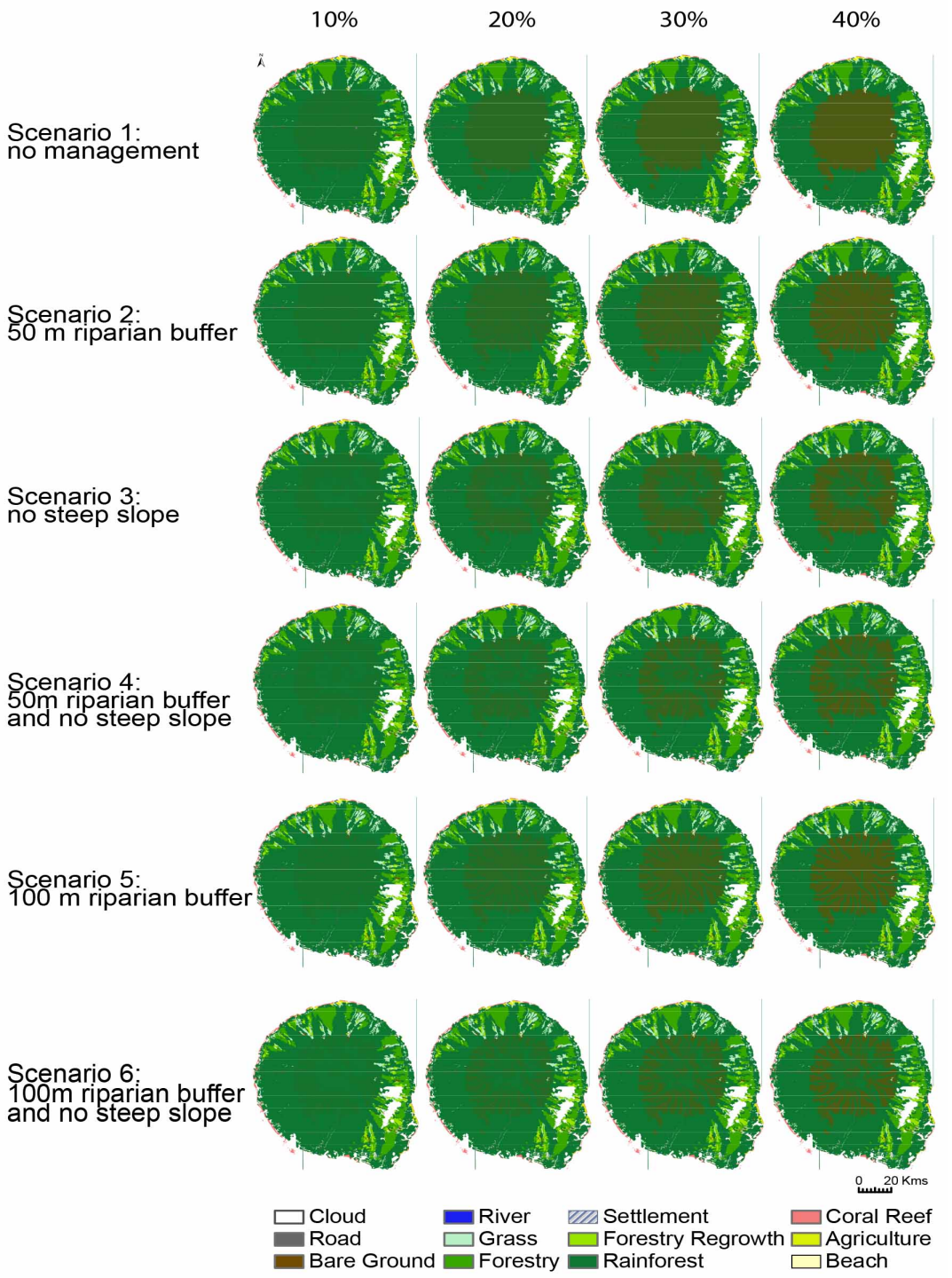
- Soil erodibility not considered as an important risk factor to consider in planning of clearing activities
- Unclear how well mitigation strategies work as clearing extent increases
- How to decide where sustainable development could occur?

# Goals of study

- How well do soil erosion management strategies minimize soil erosion and sediment runoff as the extent of land-clearing increases?
- What proportion of catchments allow for sustainable clearing while minimizing soil erosion risks or downstream impacts?
- How does the incorporation of both the risk of erosion and downstream impacts change the ability to sustainably clear?


10%
20%
30%
40%
Scenario 1:
no management
Scenario 2:
50 m riparian buffer
Scenario 3:
no steep slope
Scenario 4:
50m riparian buffer
and no steep slope
Scenario 5:
100 m riparian buffer
Scenario 6:
100m riparian buffer
and no steep slope
0 20 Kms
Cloud
Road
Bare Ground
River
Grass
Forestry
Settlement
Forestry Regrowth
Rainforest
Coral Reef
Agriculture
Beach


N
0
6.5
13 Kilometers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Cloud
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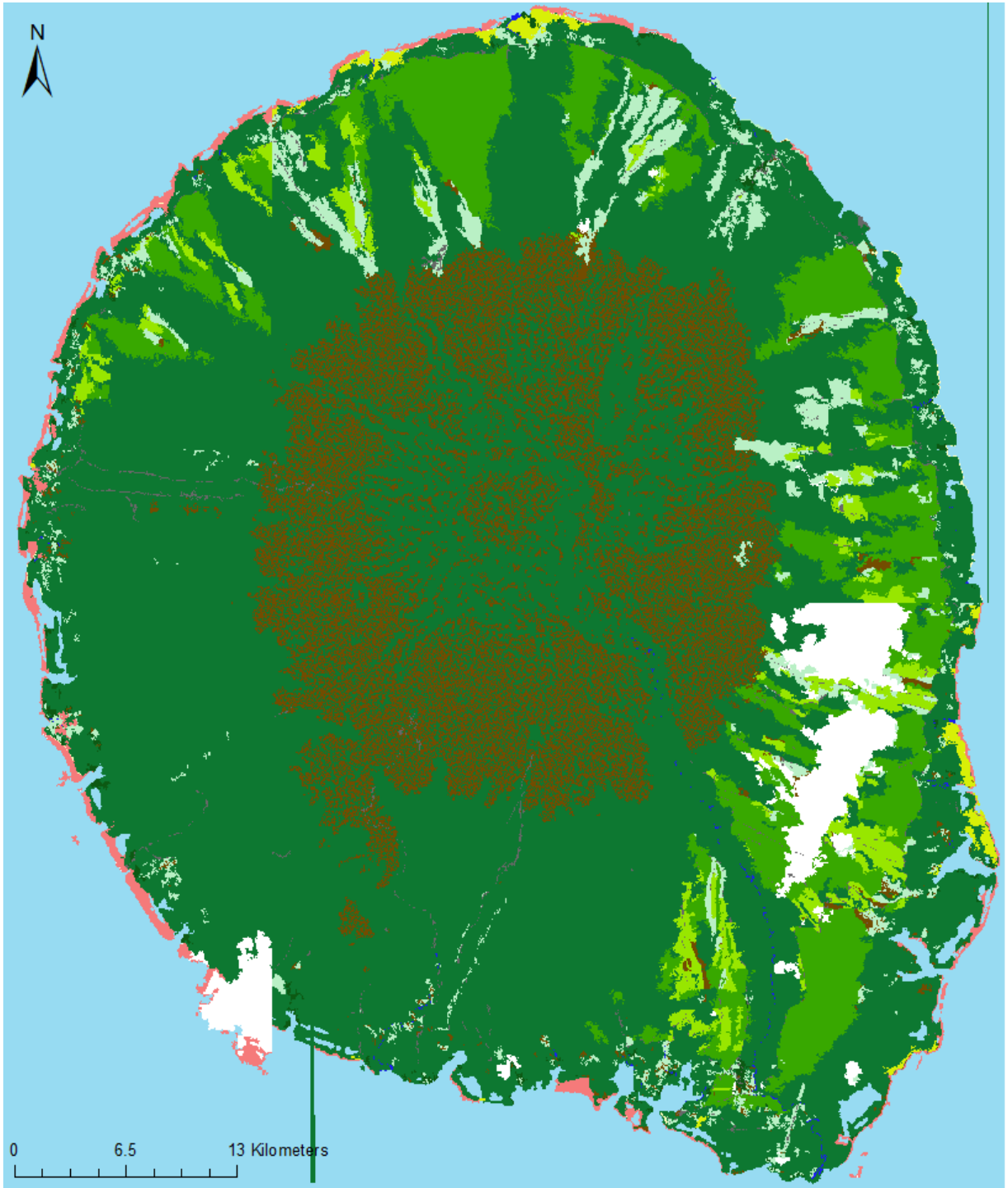
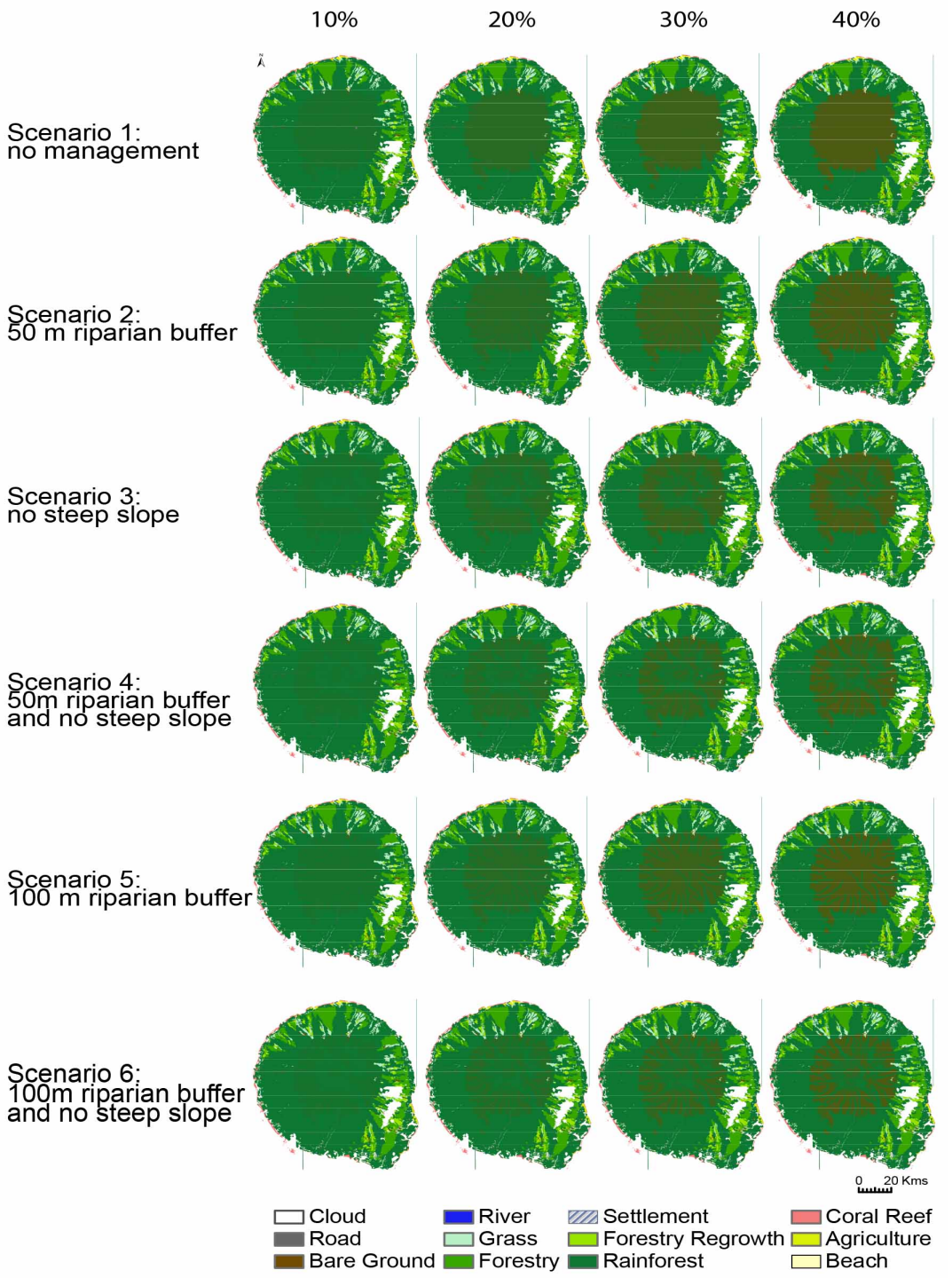

N
0
6.5
13 Kilometers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Cloud
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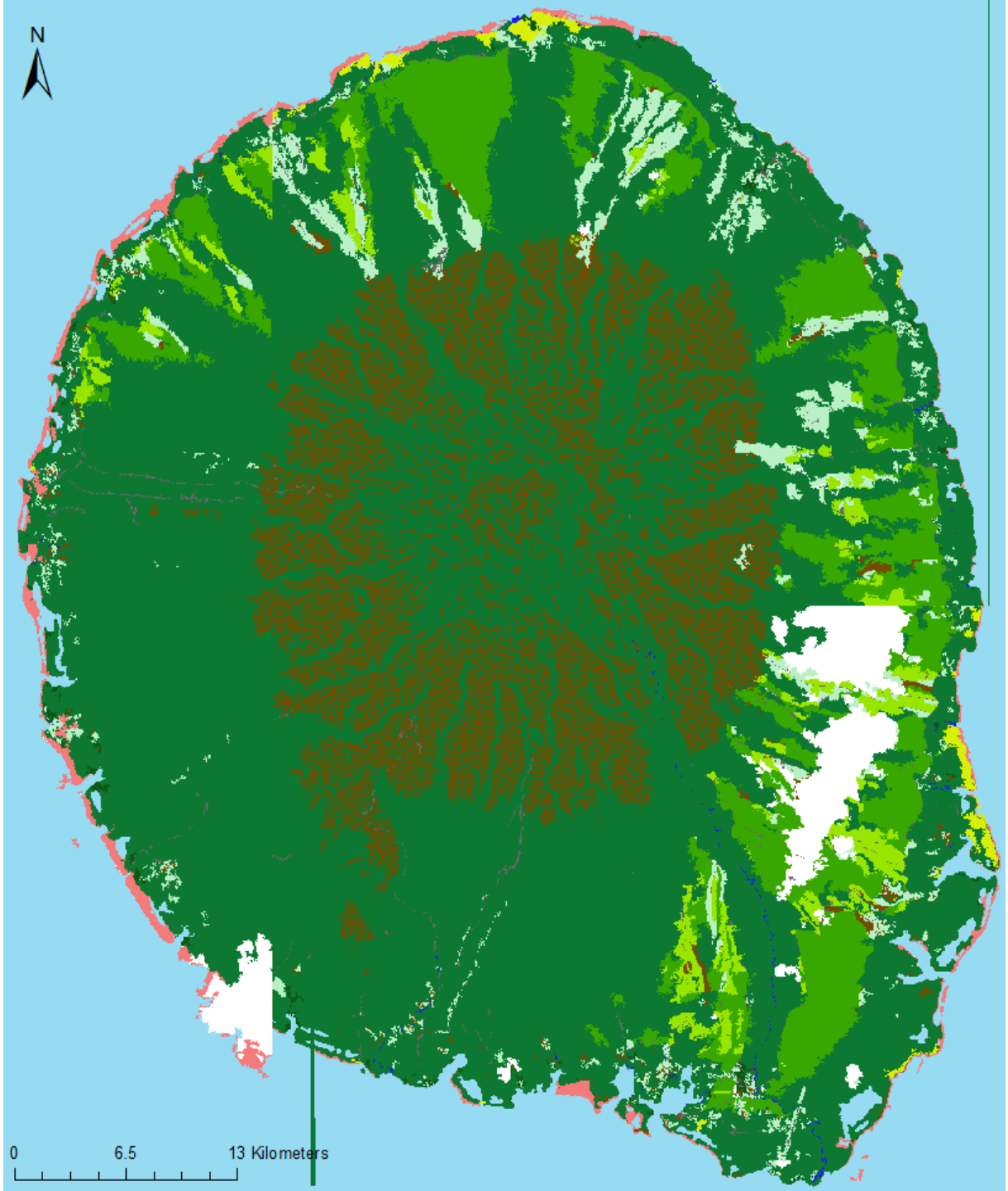
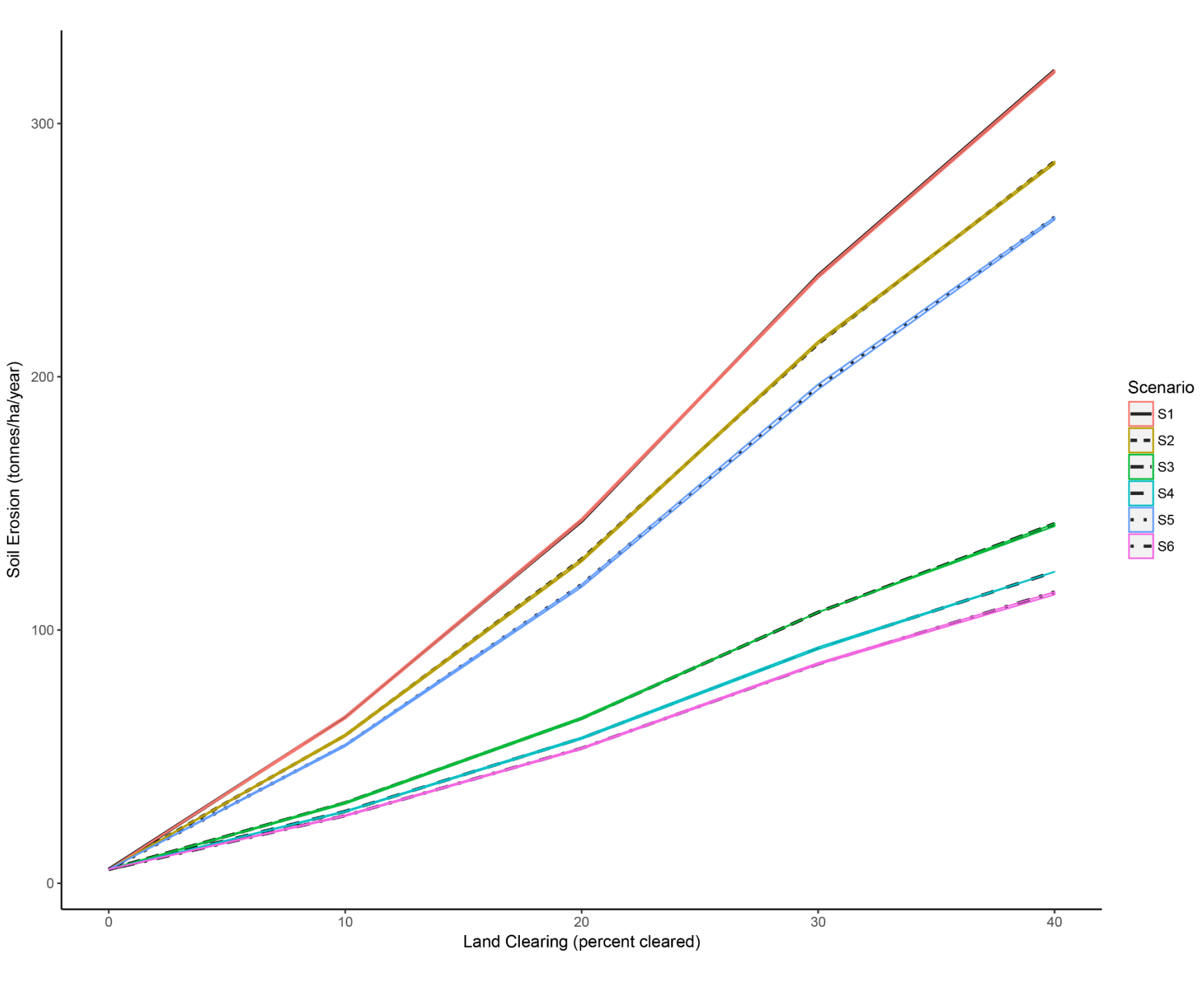
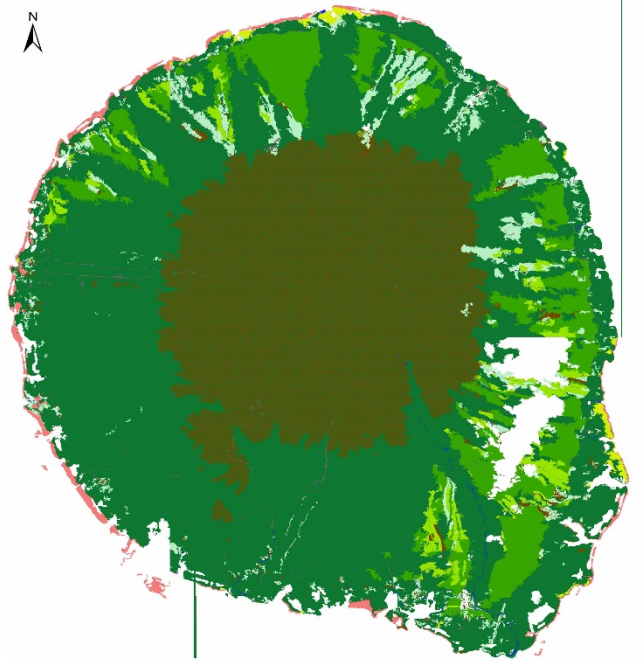
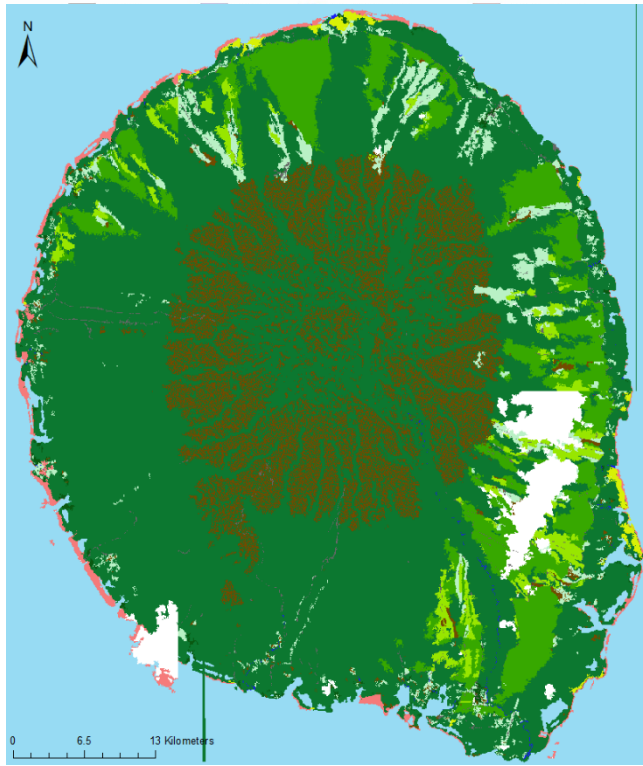
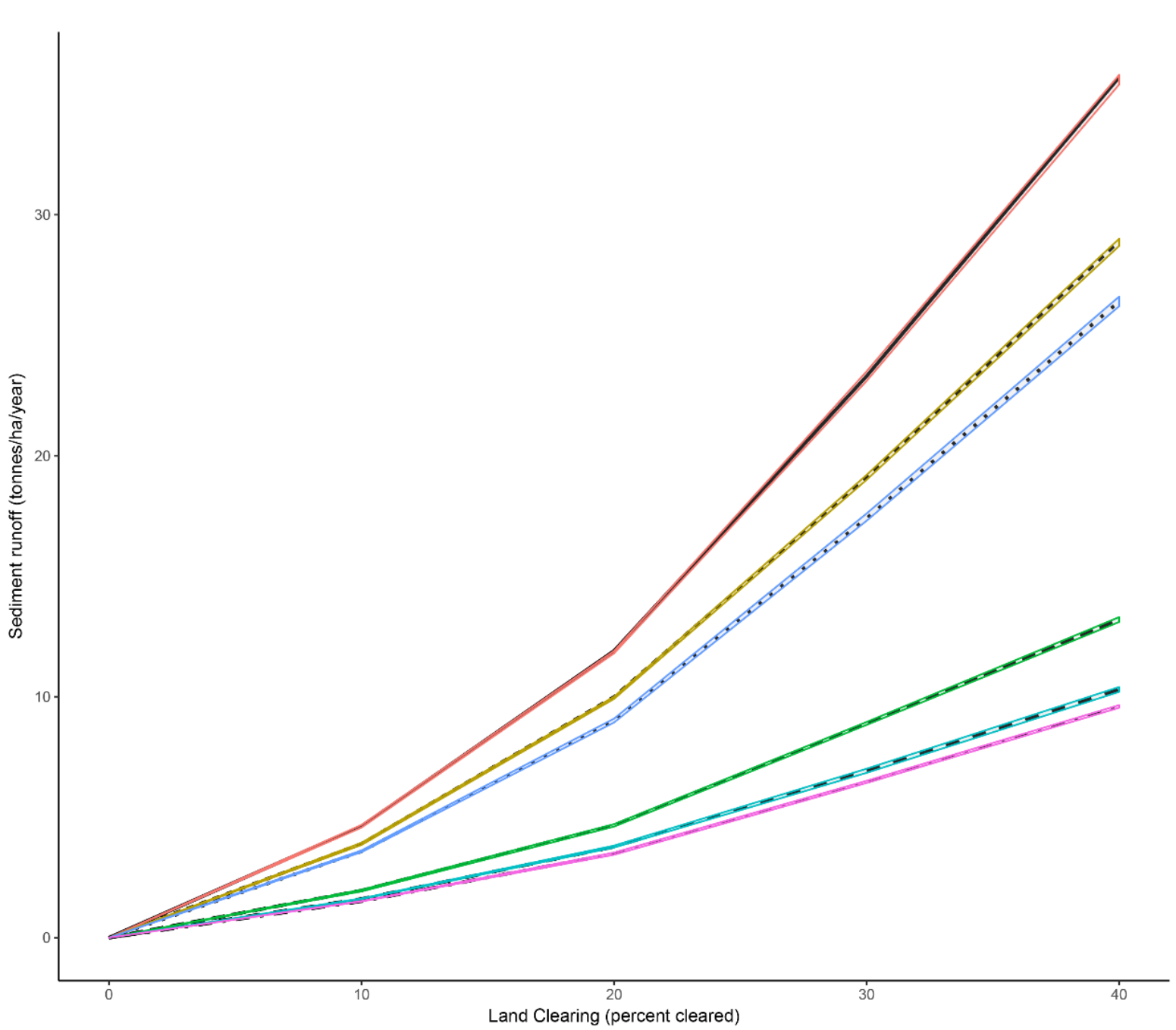

N
0
6.5
13 Kilometers

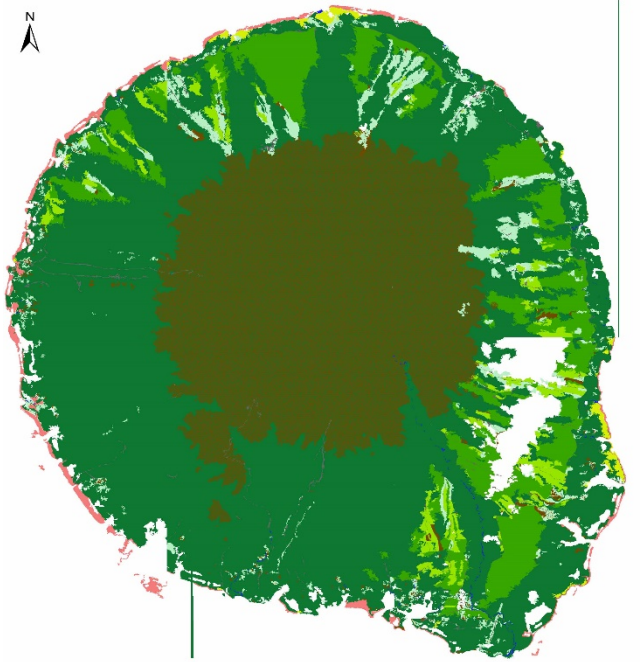

Soil Erosion (tonnes/ha/year)
300
200
100
0
0
10
20
30
40
Land Clearing (percent cleared)
Scenario
S1
S2
S3
S4
S5
S6

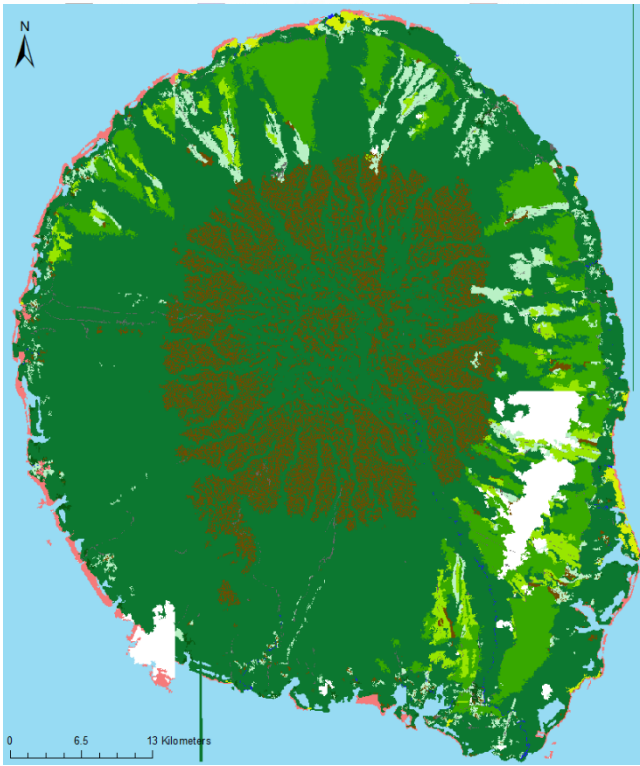

N


N
0
6.5
13 Kilometers


Sediment runoff (tonnes/ha/year)
0
10
20
30
0
10
20
30
40
Land Clearing (percent cleared)
Scenario
S1
S2
S3
S4
S5
S6

~75%


N


N
0
6.5
13 Kilometers

# Goals of study

- How well do soil erosion management strategies minimize soil erosion and sediment runoff as the extent of land-clearing increases?
- What proportion of catchments allow for sustainable clearing while minimizing soil erosion risks or downstream impacts?
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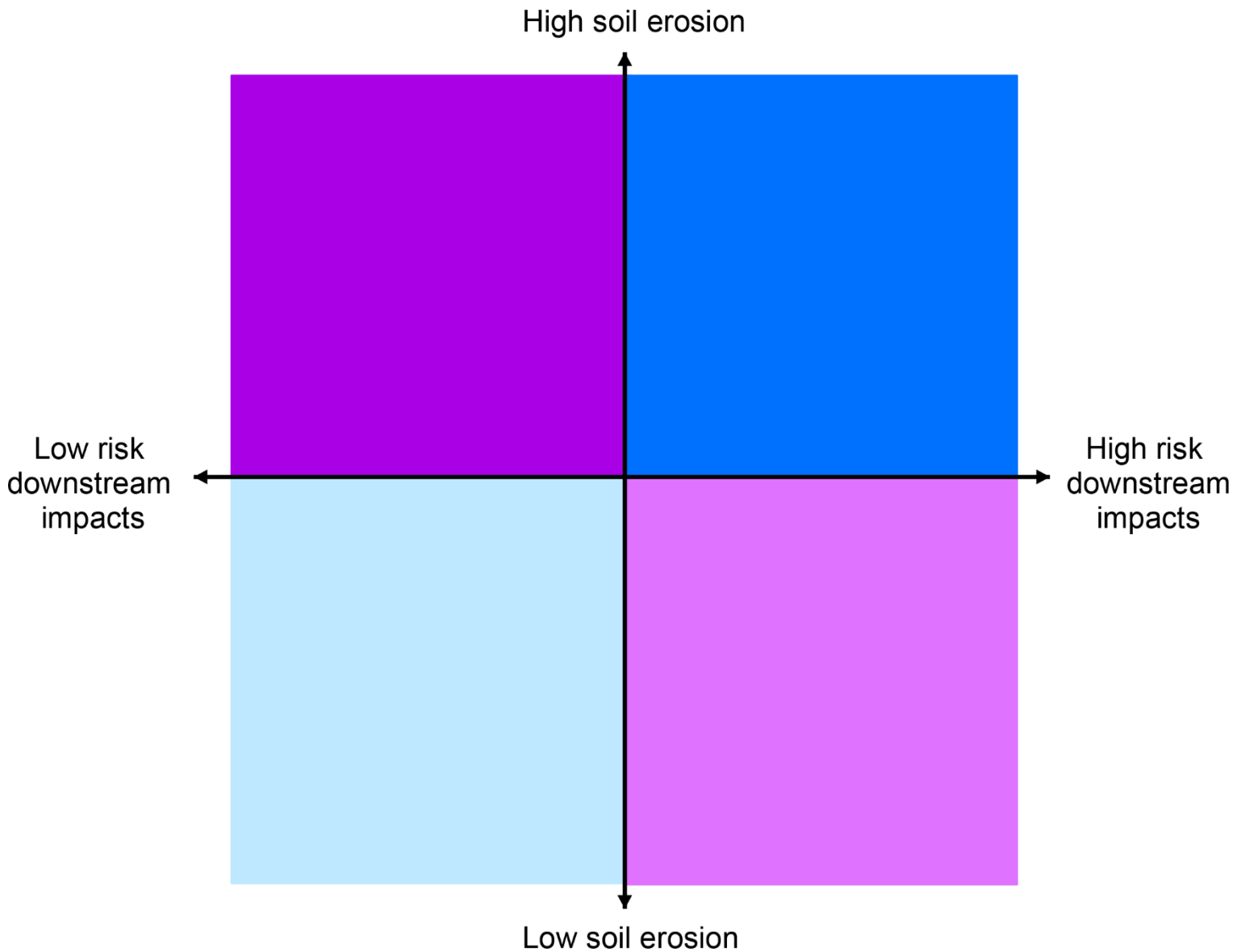
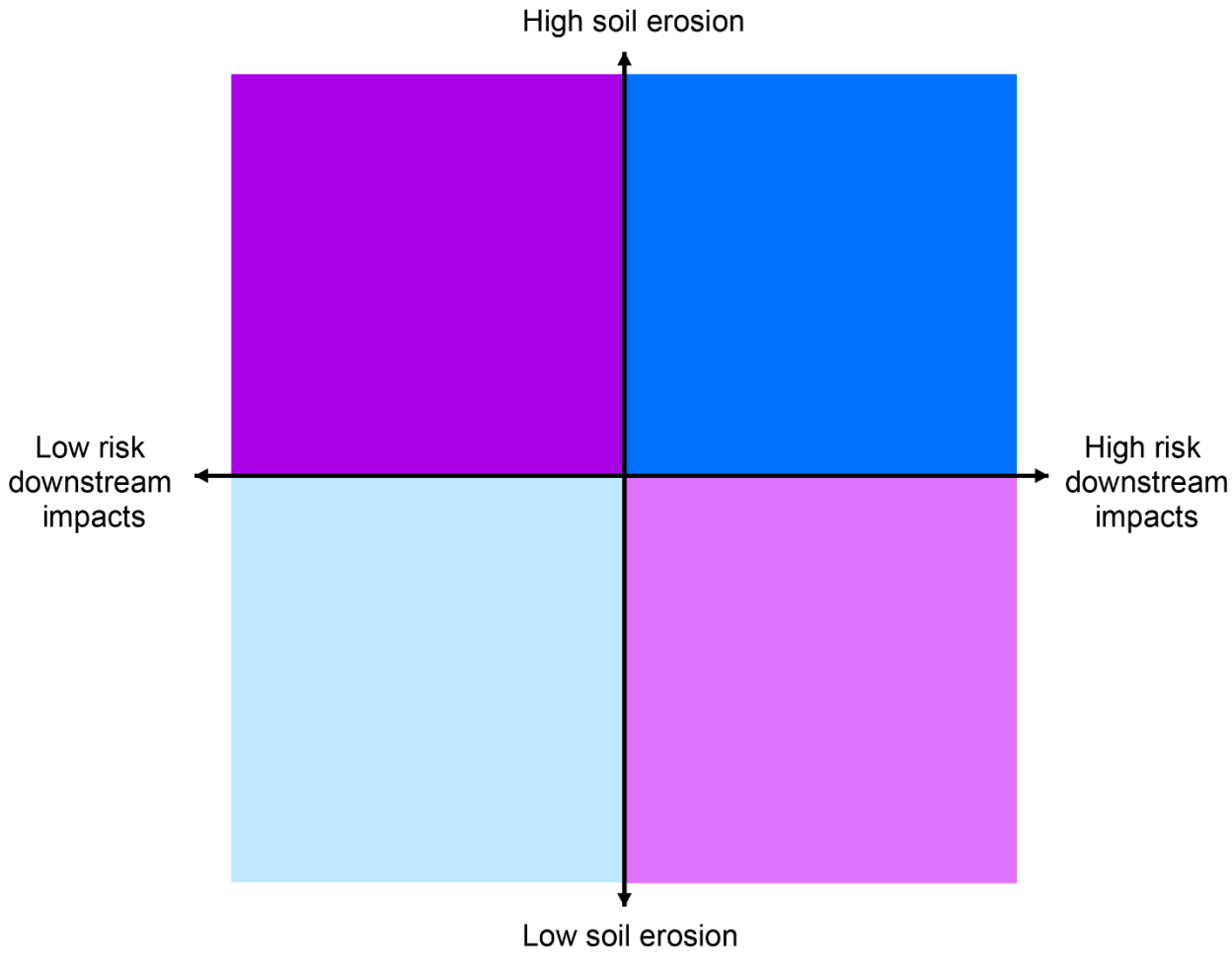

High soil erosion
Low risk downstream impacts
High risk downstream impacts
Low soil erosion

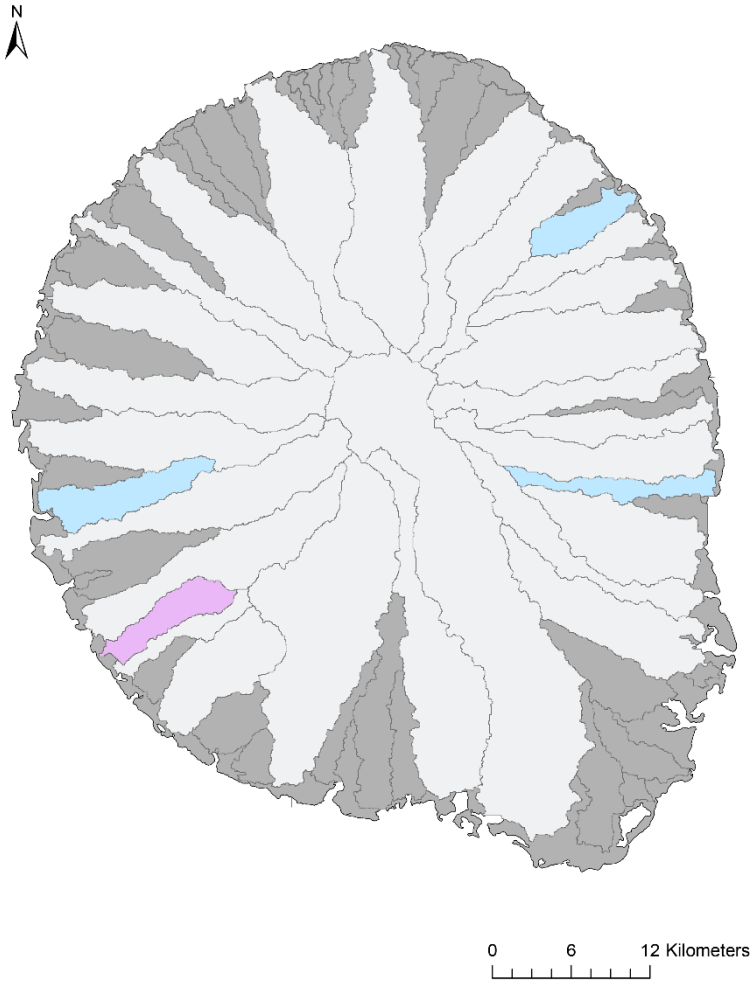
- Identified catchments that had erosion rates of less than 11 t/ha/yr

- Developed downstream impact risk score based on size of settlements and sediment runoff rates

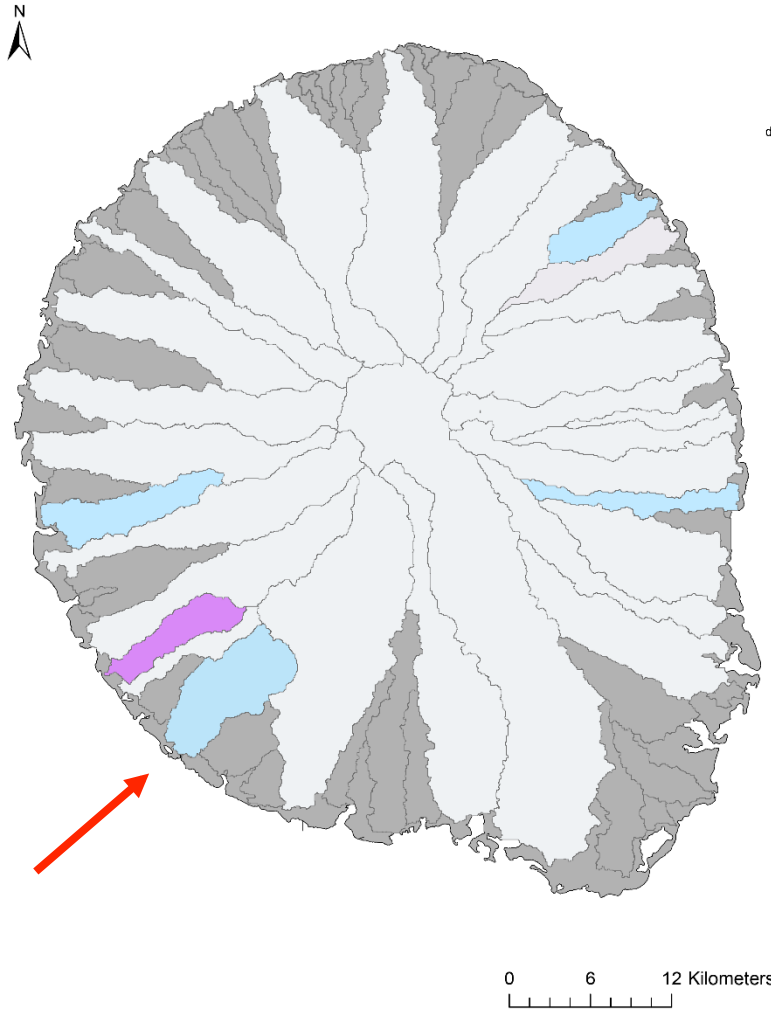


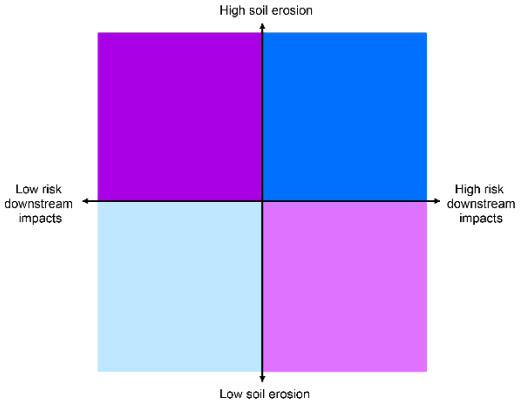
# Only considering soil erosion rates

No management 10% clearing



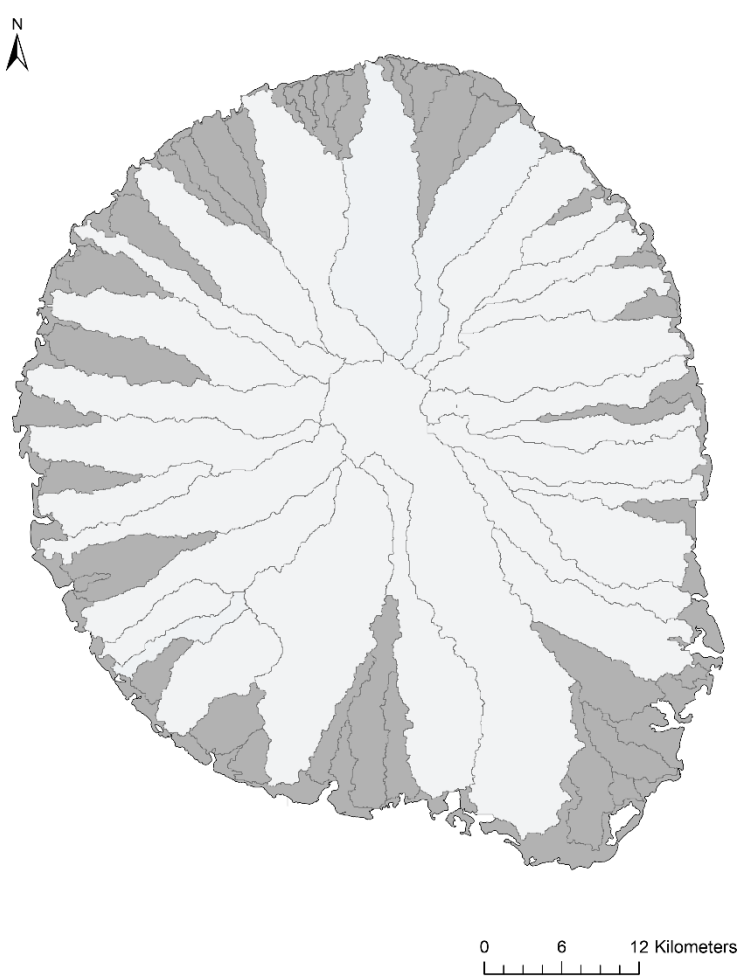

Logging COP 10% clearing



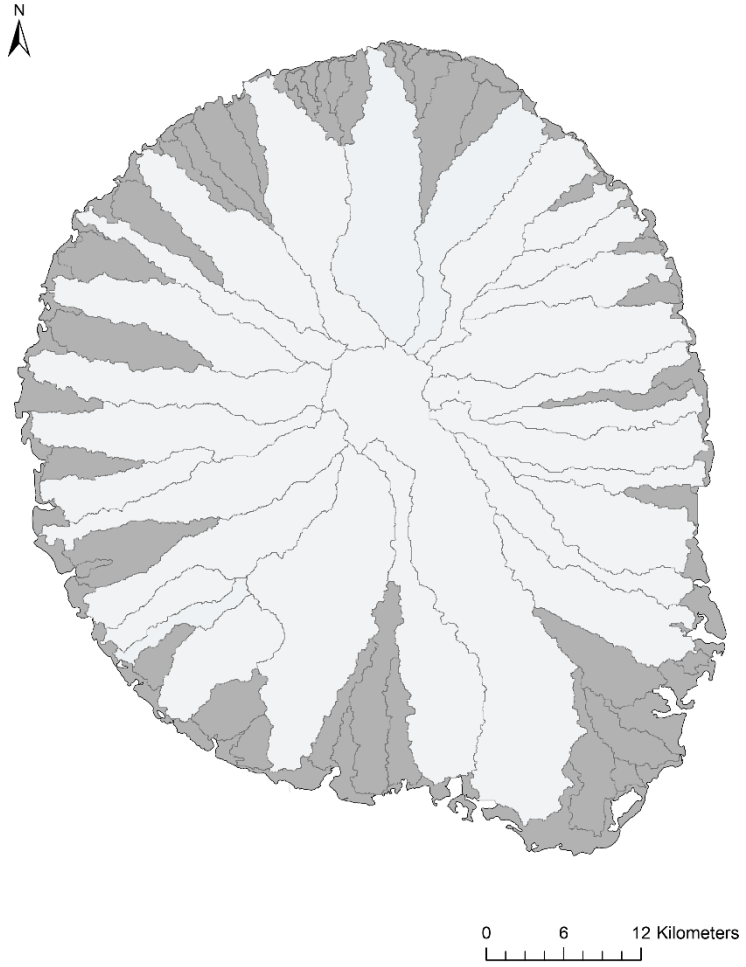



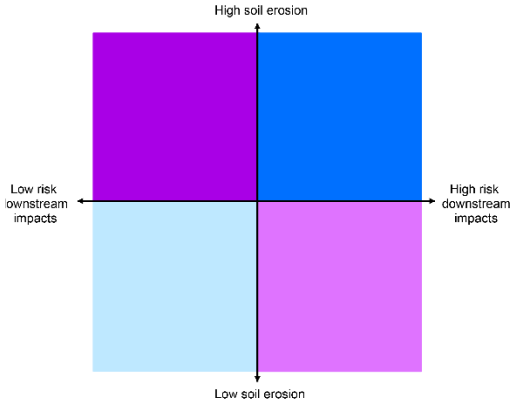
# Only considering soil erosion rates

No management 40% clearing



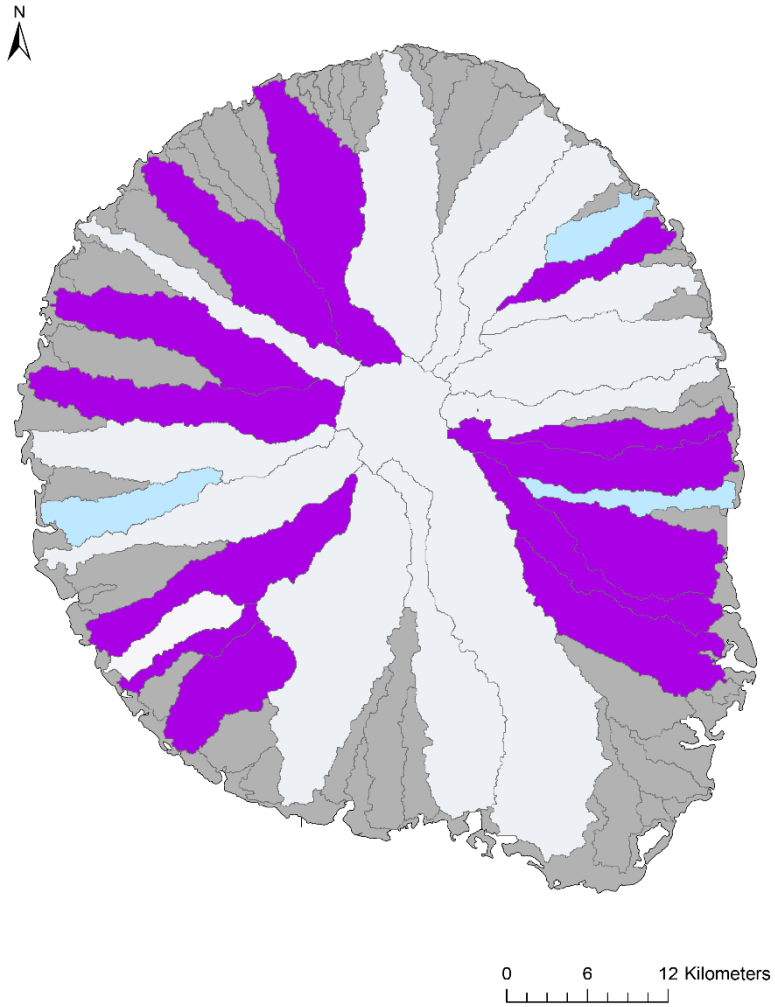

Logging COP 40% clearing



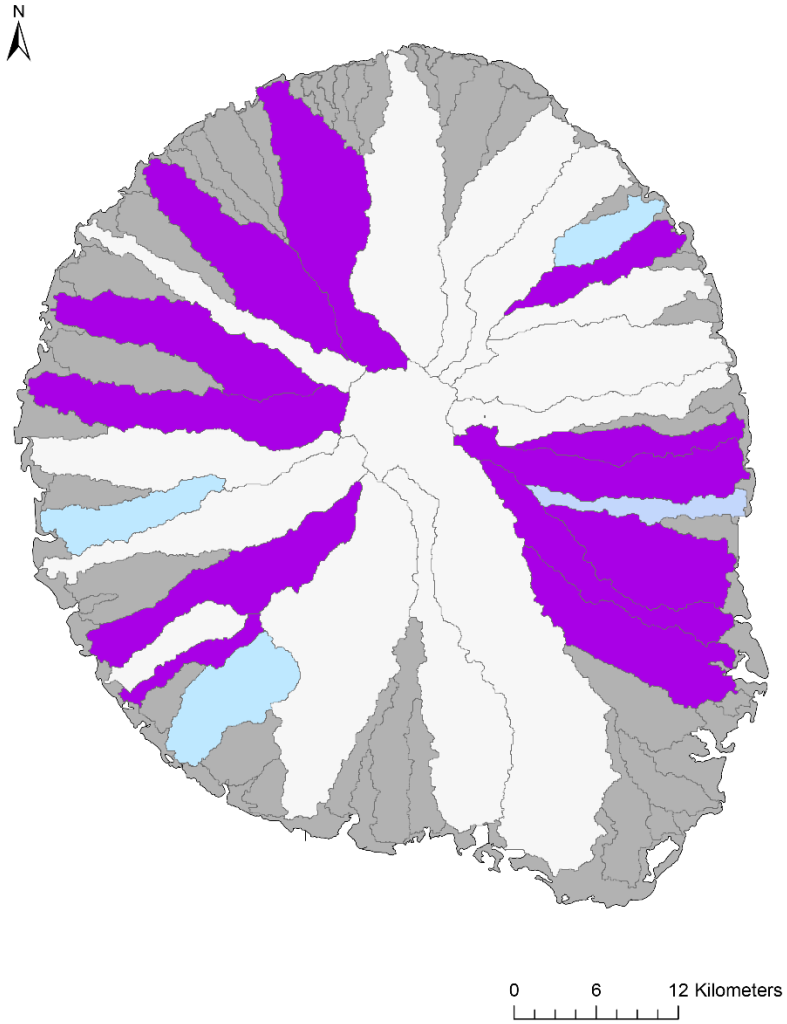



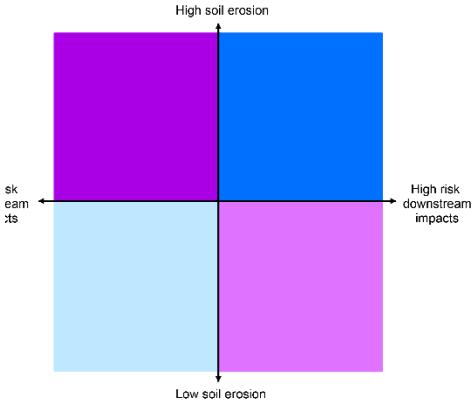
# Only considering downstream impacts

No management 10% clearing




Logging COP 10% clearing



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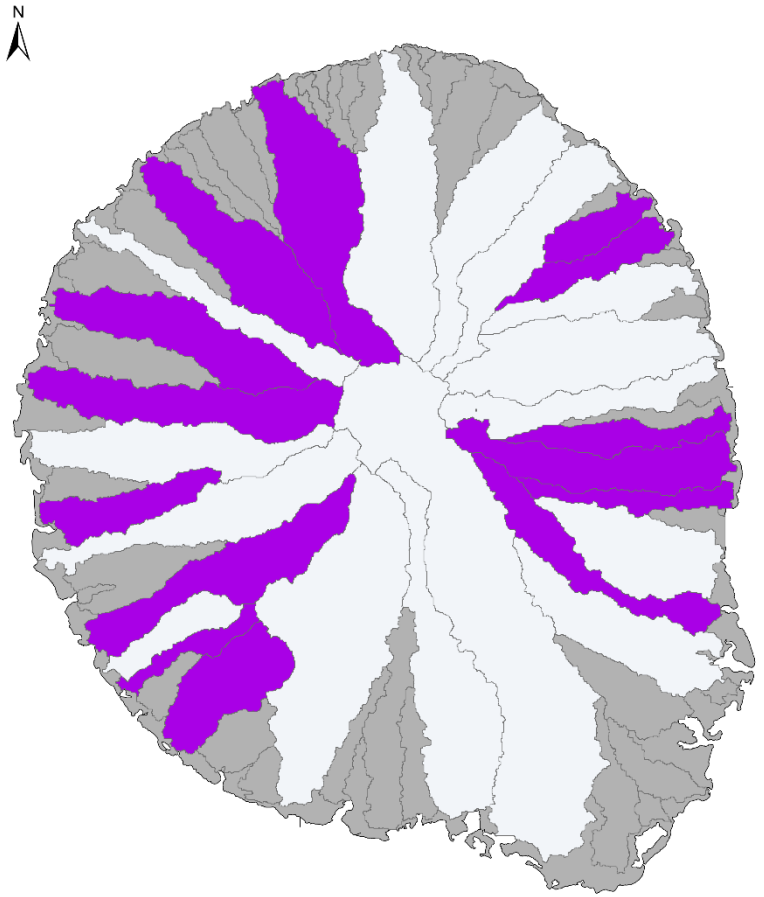
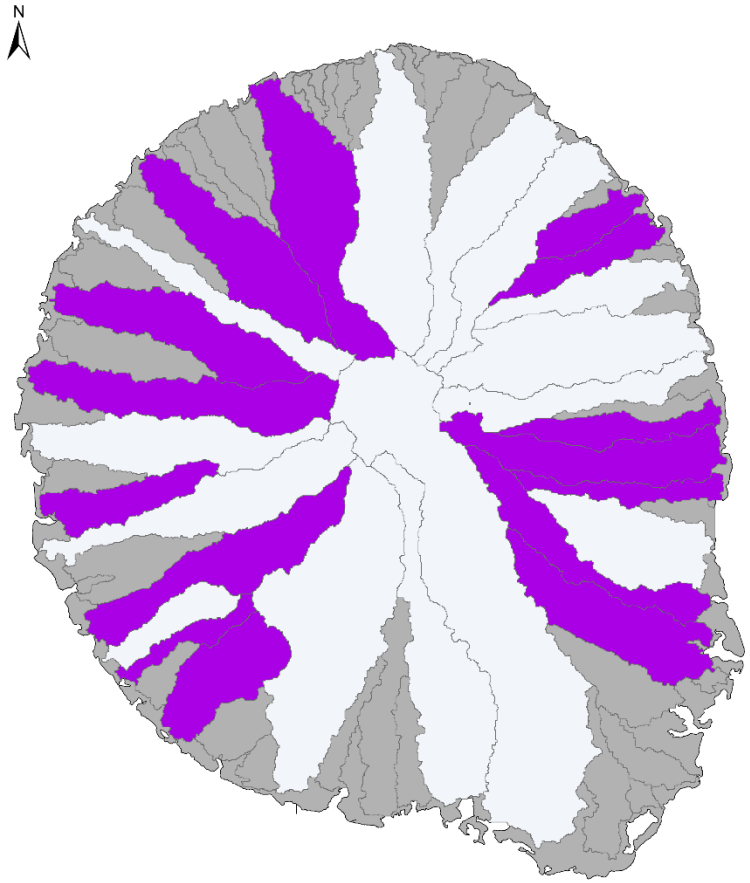
No management 40% clearing

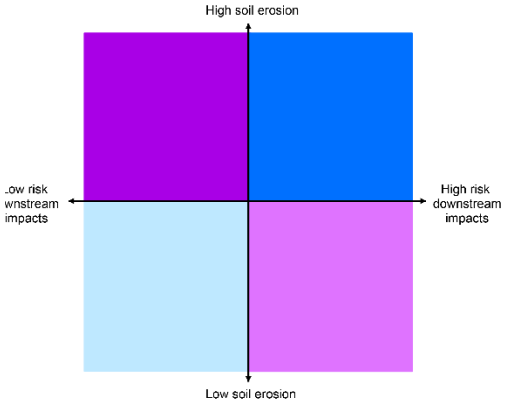



0 6 12 Kilometers

Logging COP 40% clearing

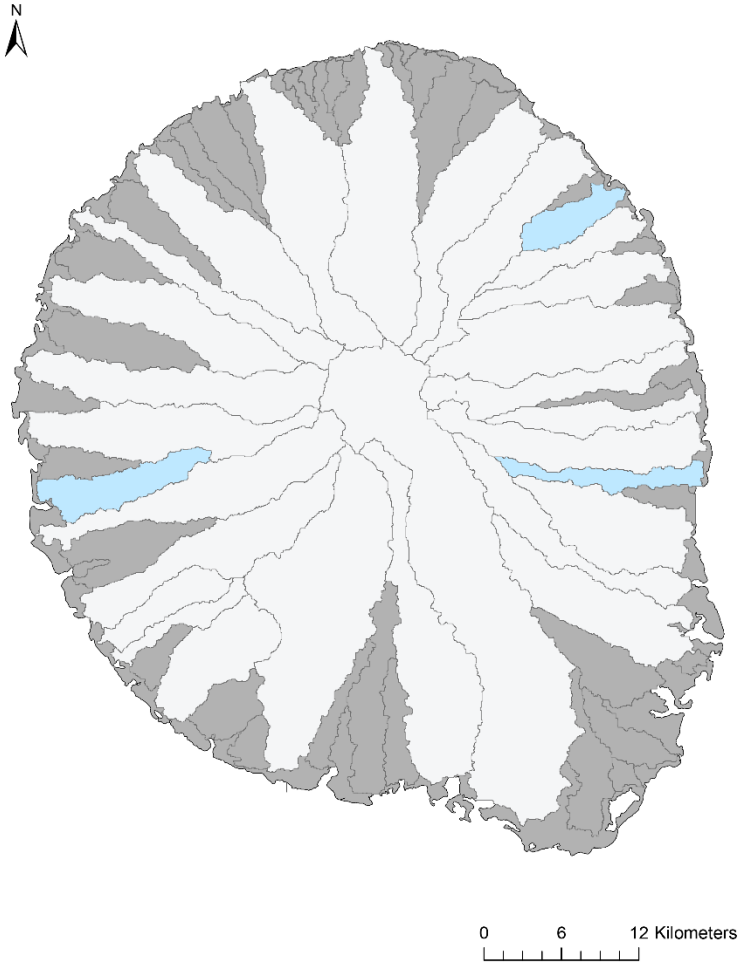



0 6 12 Kilometers

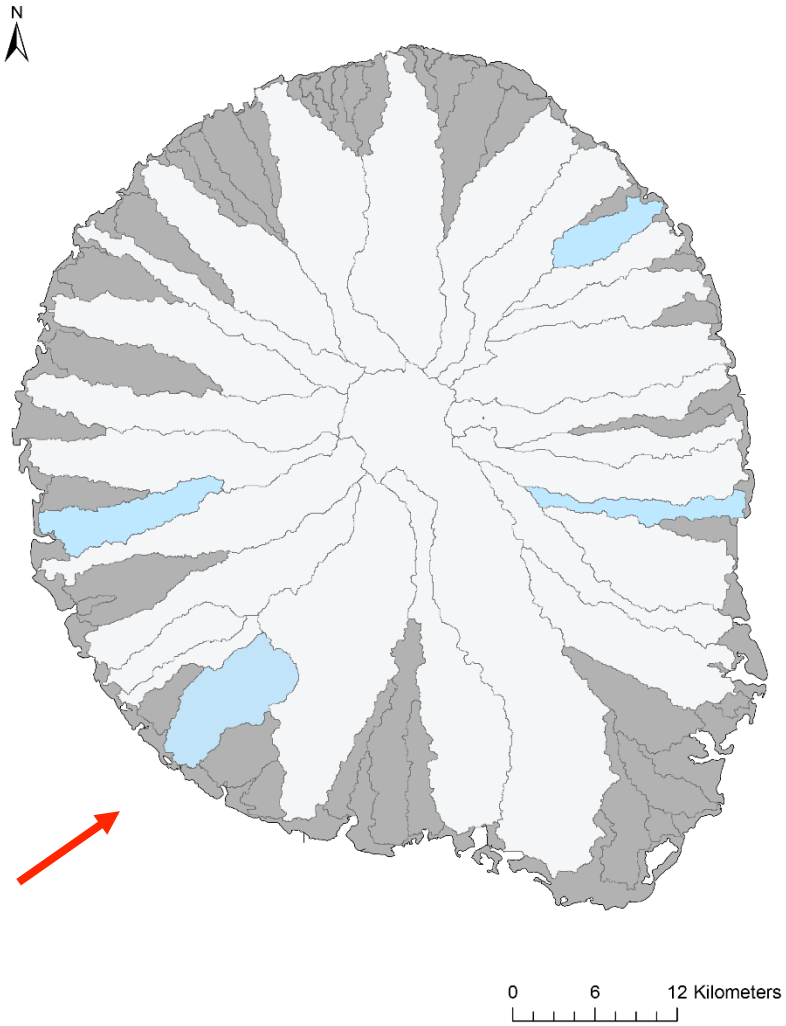


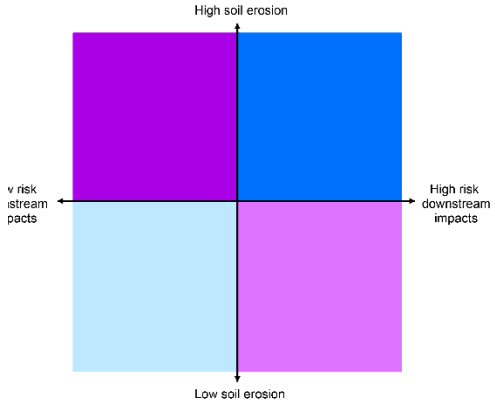
# Considering both erosion and downstream impacts

No management 10% clearing



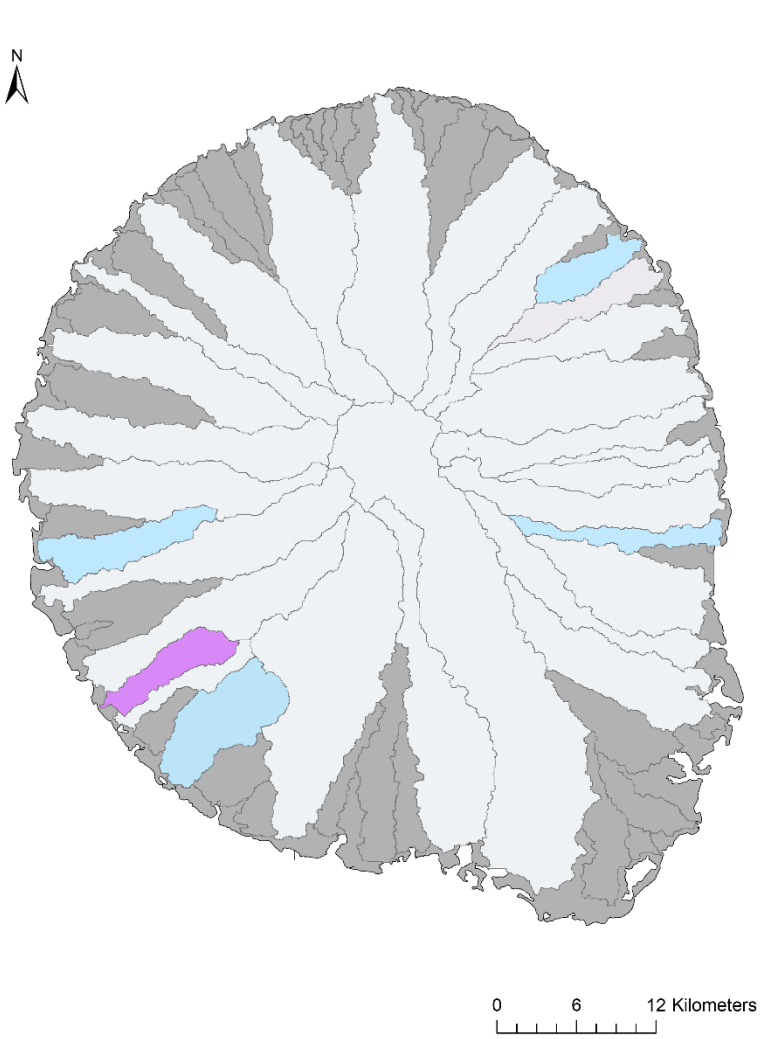

Logging COP 10% clearing



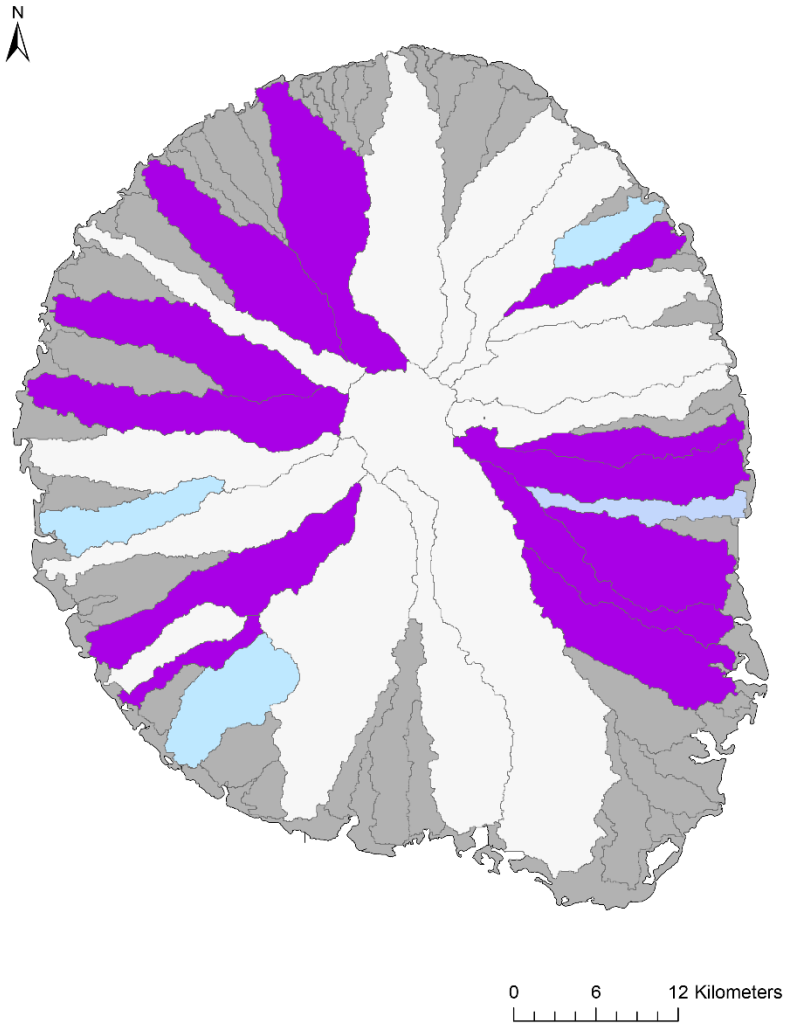



# Considering both erosion and downstream impacts

Erosion only 10% clearing

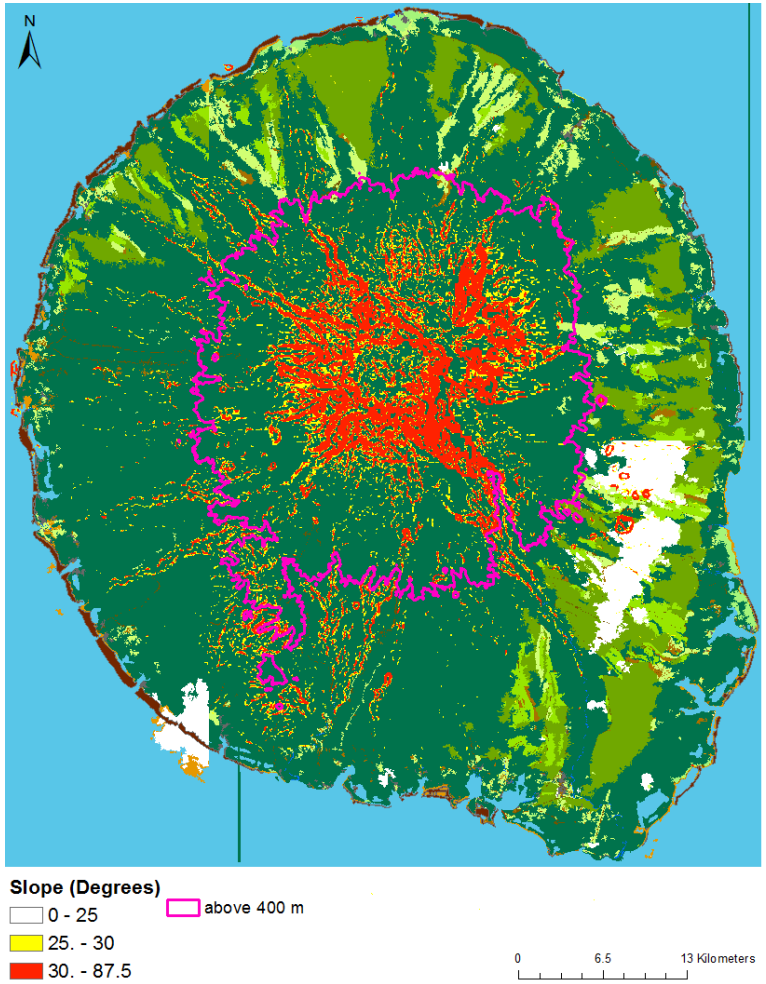



Downstream only 10% clearing



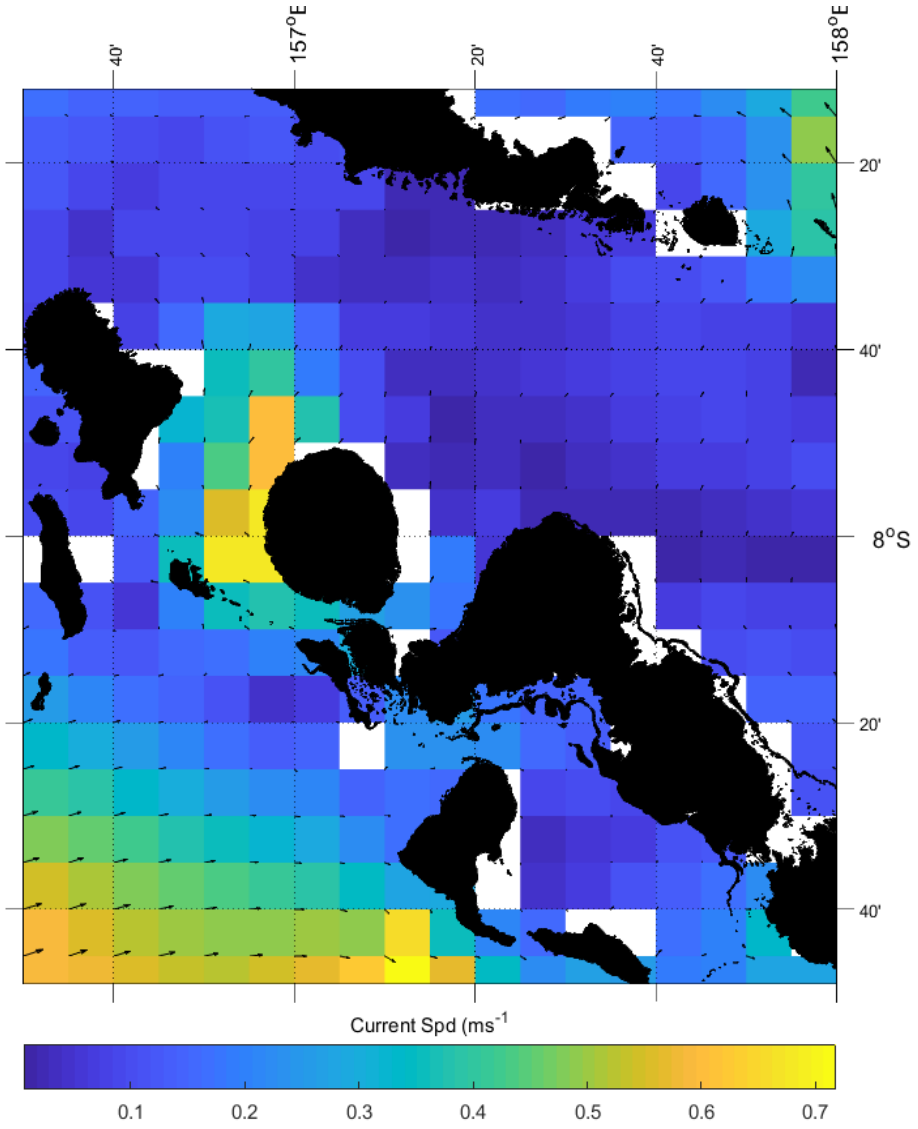

Both 10% clearing

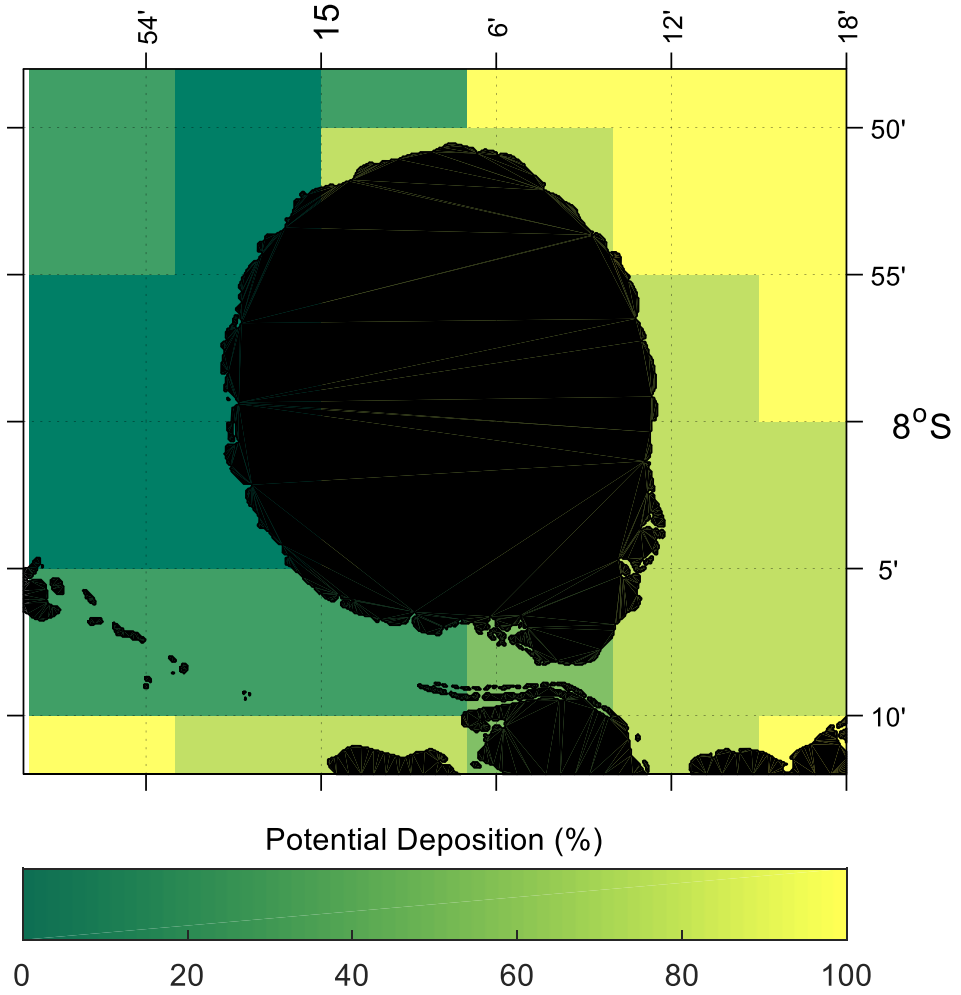
# Considering both erosion and downstream impacts




# Take home messages

- Unlikely that clearing above 400m will be sustainable in the long-term
- Management strategies can reduce soil erosion and sediment runoff but it needs to be linked to relevant thresholds
- Considering both direct and downstream impacts important!!


40'
157°E
20'
40'
158°E
20'
40'
8°S
20'
40'
Current Spd (ms-1
0.1
0.2
0.3
0.4
0.5
0.6
0.7


54'
15
6'
12'
18'
50'
55'
8°S
5'
10'
Potential Deposition (%)
0
20
40
60
80
100


THANK YOU!
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