CHANGE DETECTION MAPPINHG

PRESENTED BY

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Introduction

Composite models of space and time were developed in the study of human behaviour.

- Time geography developed at Lund University (Sweden) during the 1970s.

Spatio-temporal data

Modern society regulates its activities according to the Gregorian calendar:

- forward passage of time
- conventional measures (seconds, hours days, years).

T = {0, 1, 2, ... now .....}

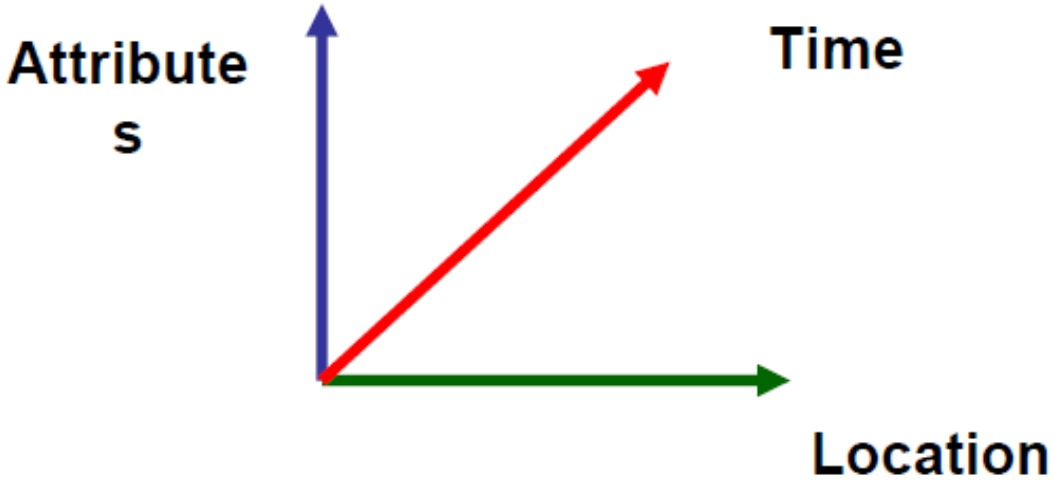
past future

Change detection

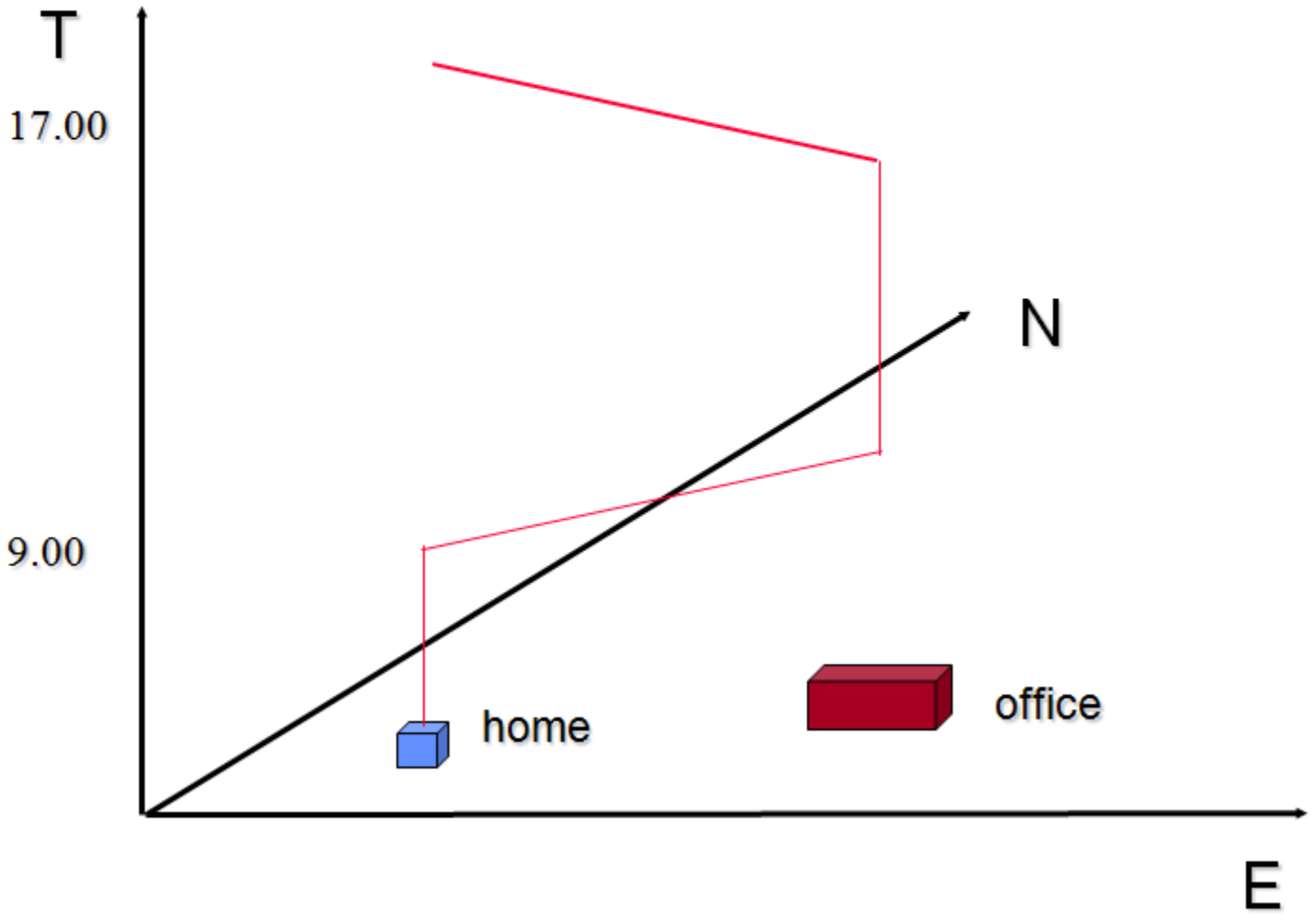
In Theory

Spatio-Temporal GIS

Change in spatial data through time



Space-time diagram

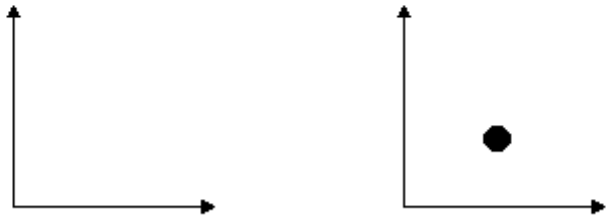


Spatio-temporal behaviour

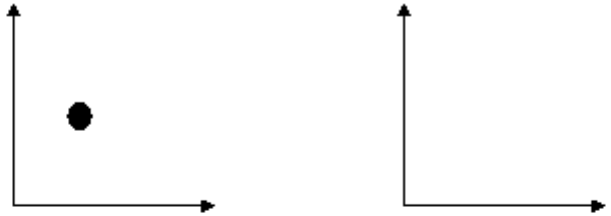
Geographical features exhibit a wide variety of temporal behaviour:

- *isolated events*
- *continuity*
- *fluctuation*
- *sequential time-series*

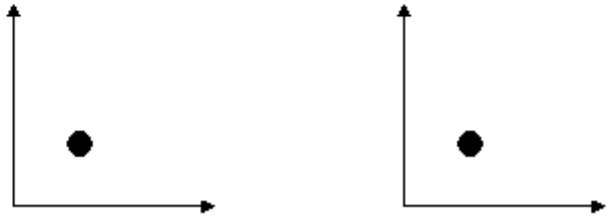
Spatio-temporal behaviour : basic processes



Appearance (“birth”)

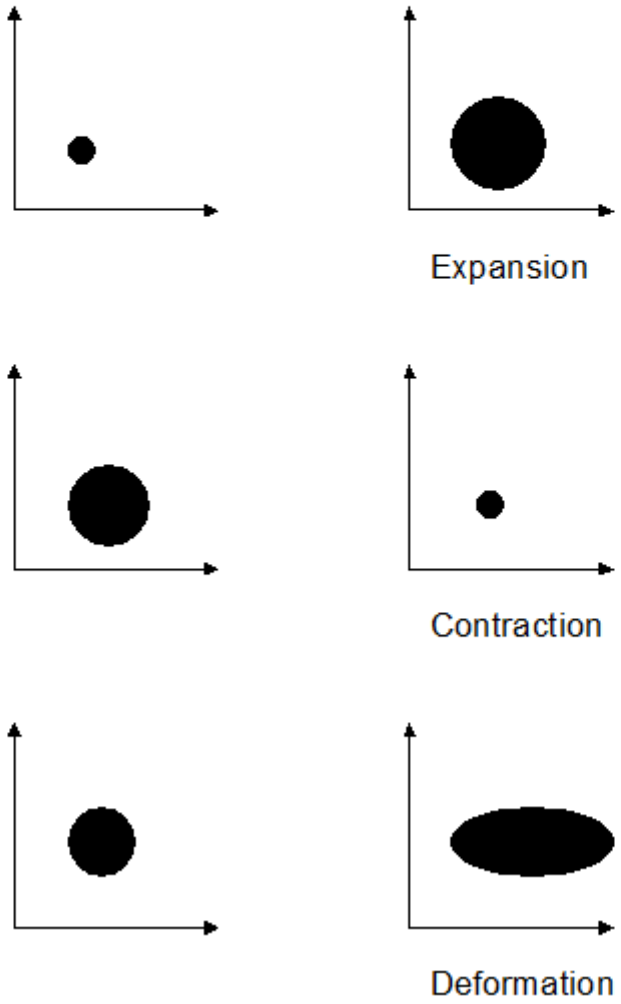


Disappearance (“death”)

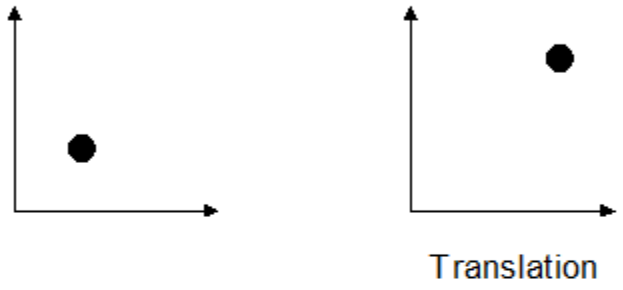


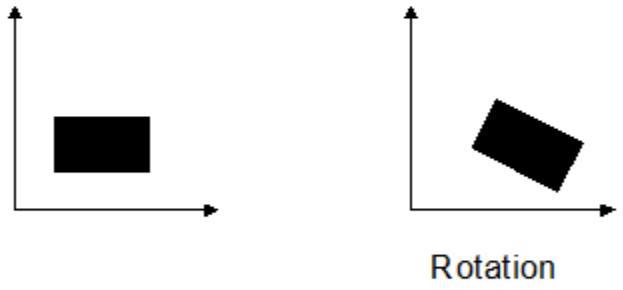
Stability

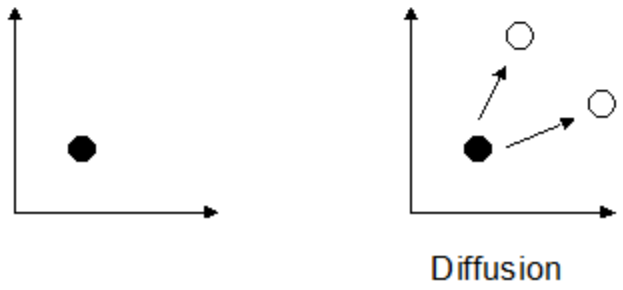
Spatio-temporal behaviour : transformations



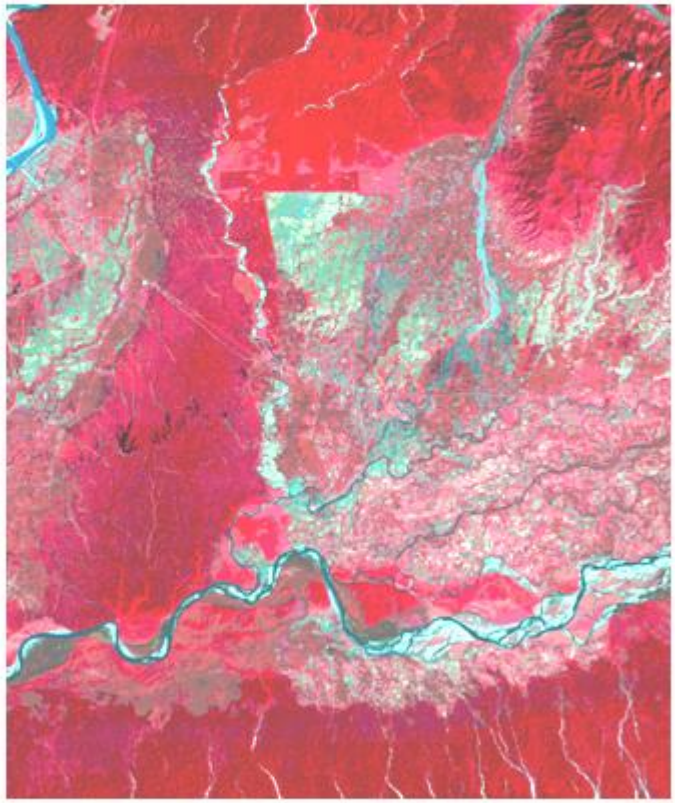
Spatio-temporal behaviour : movements



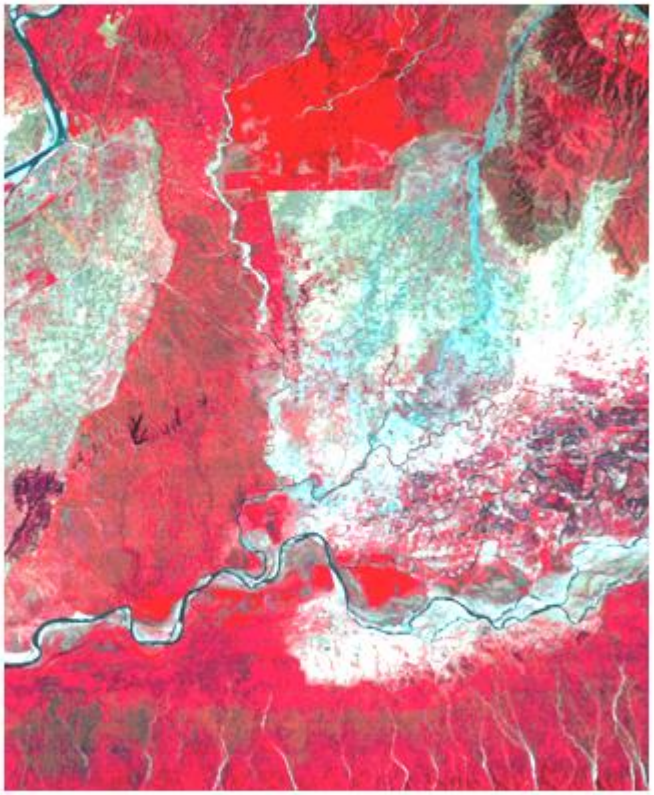




Time slices or snapshots

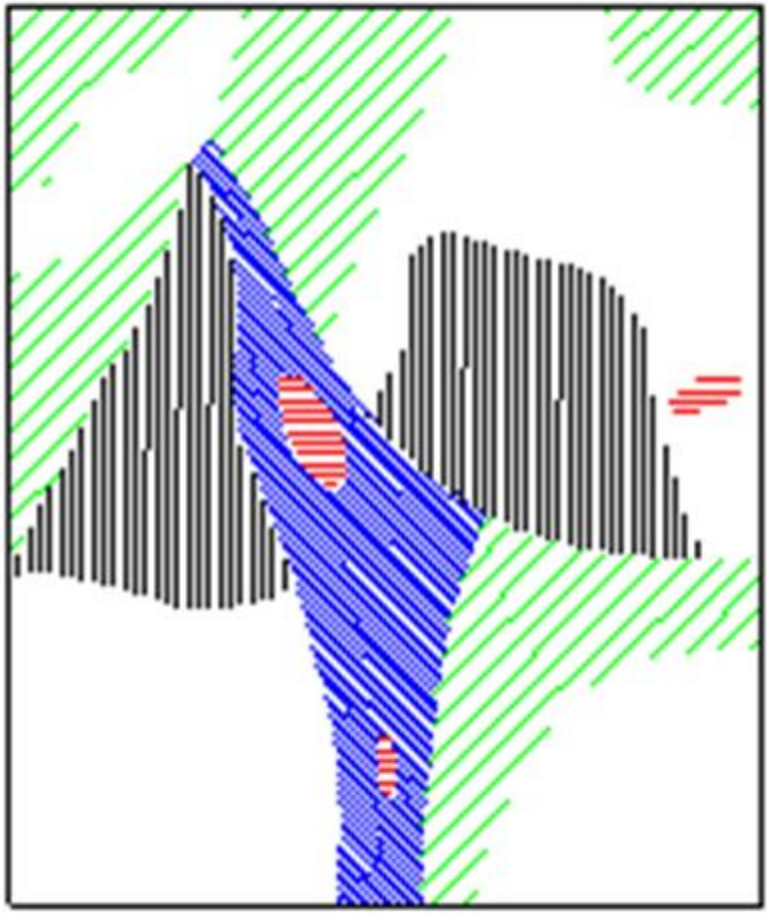


October 1988



May 1992

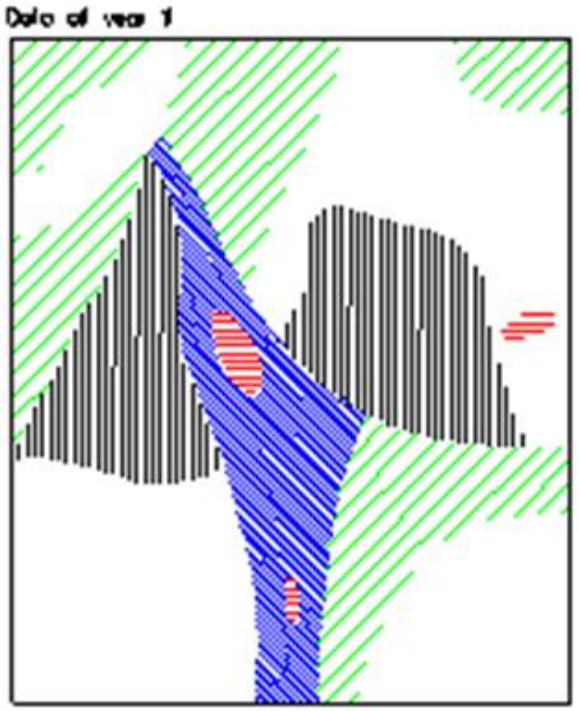
Change detection

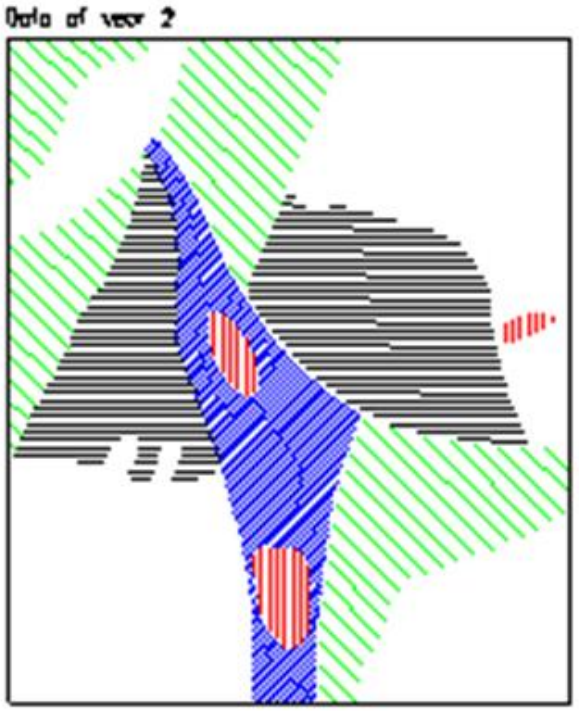


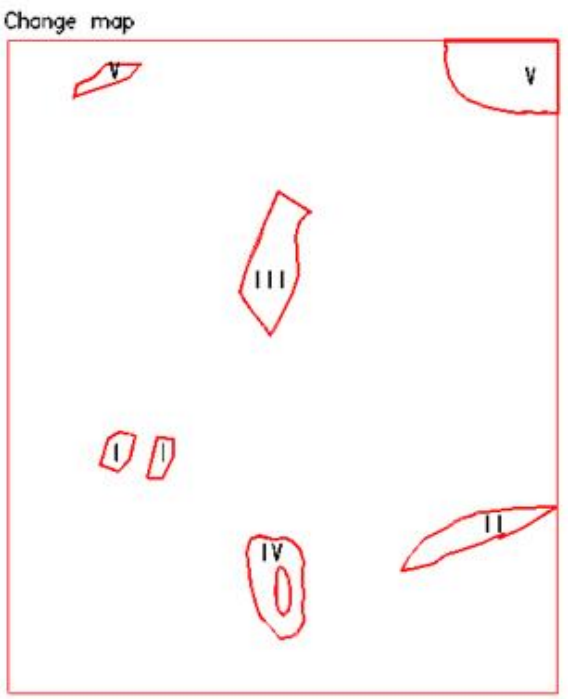
Year X

Year X+5

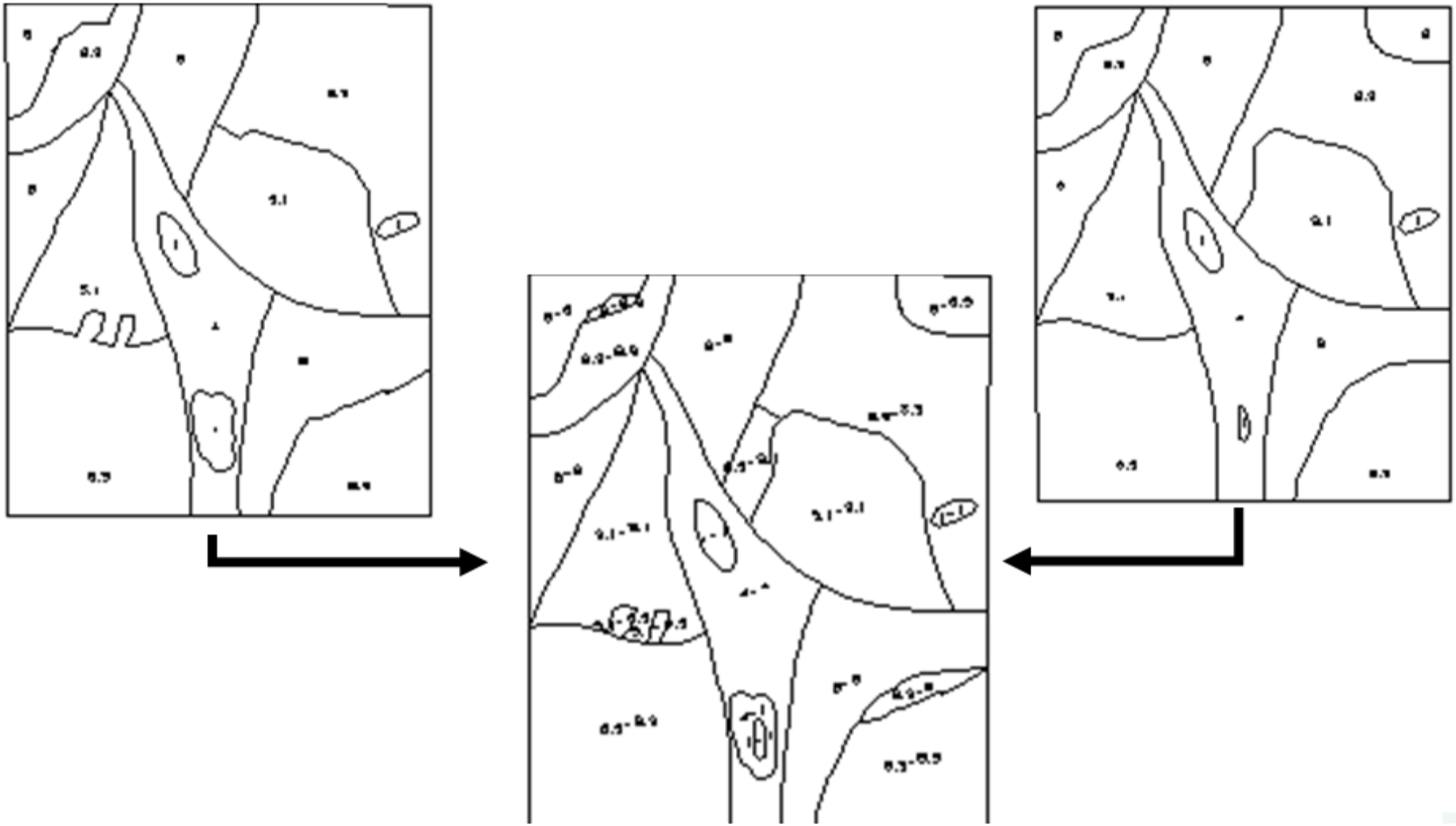
Change detection



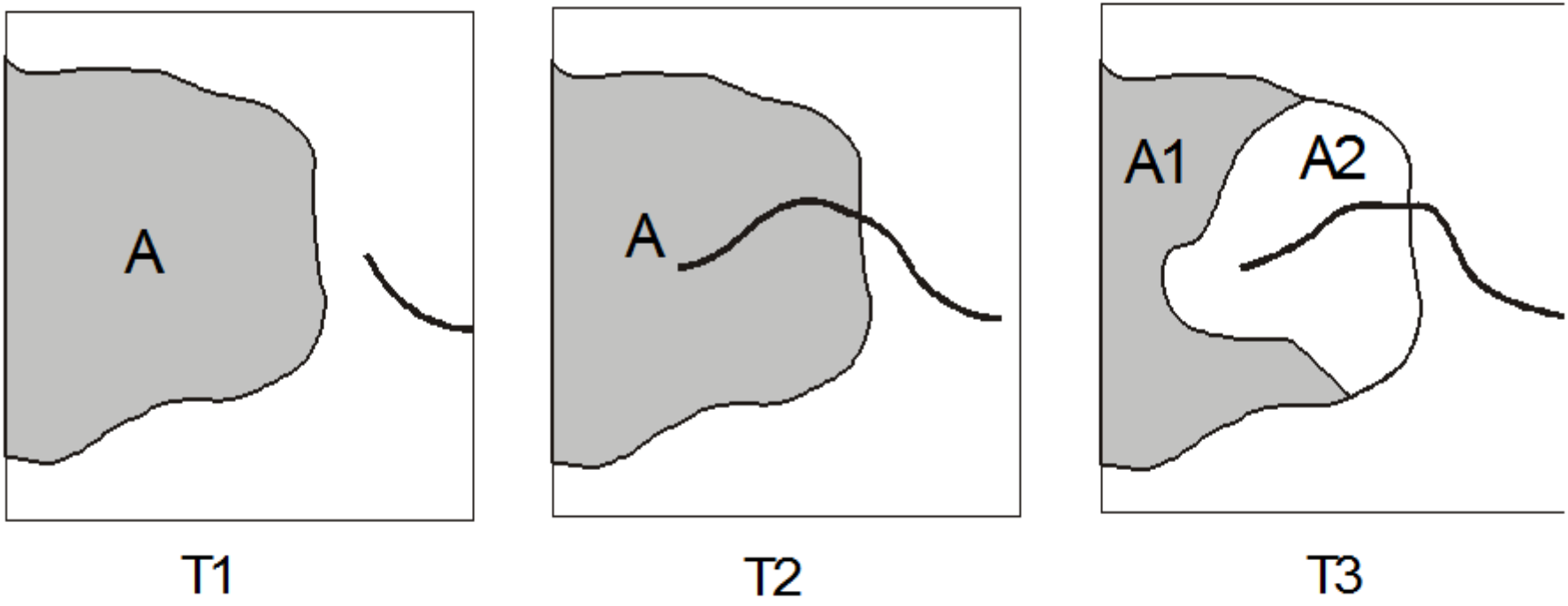




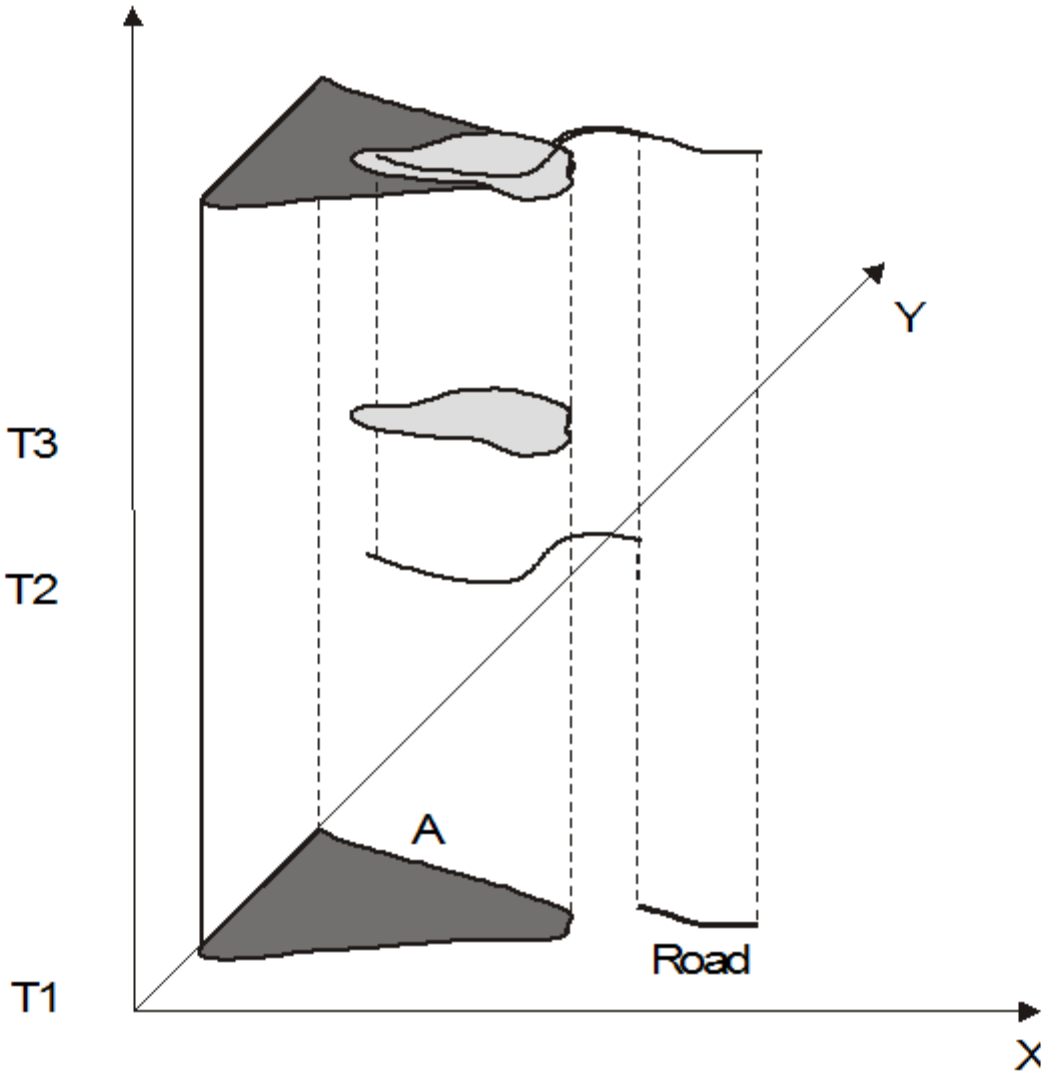
Change detection



Object oriented ST data model



Object oriented ST data model

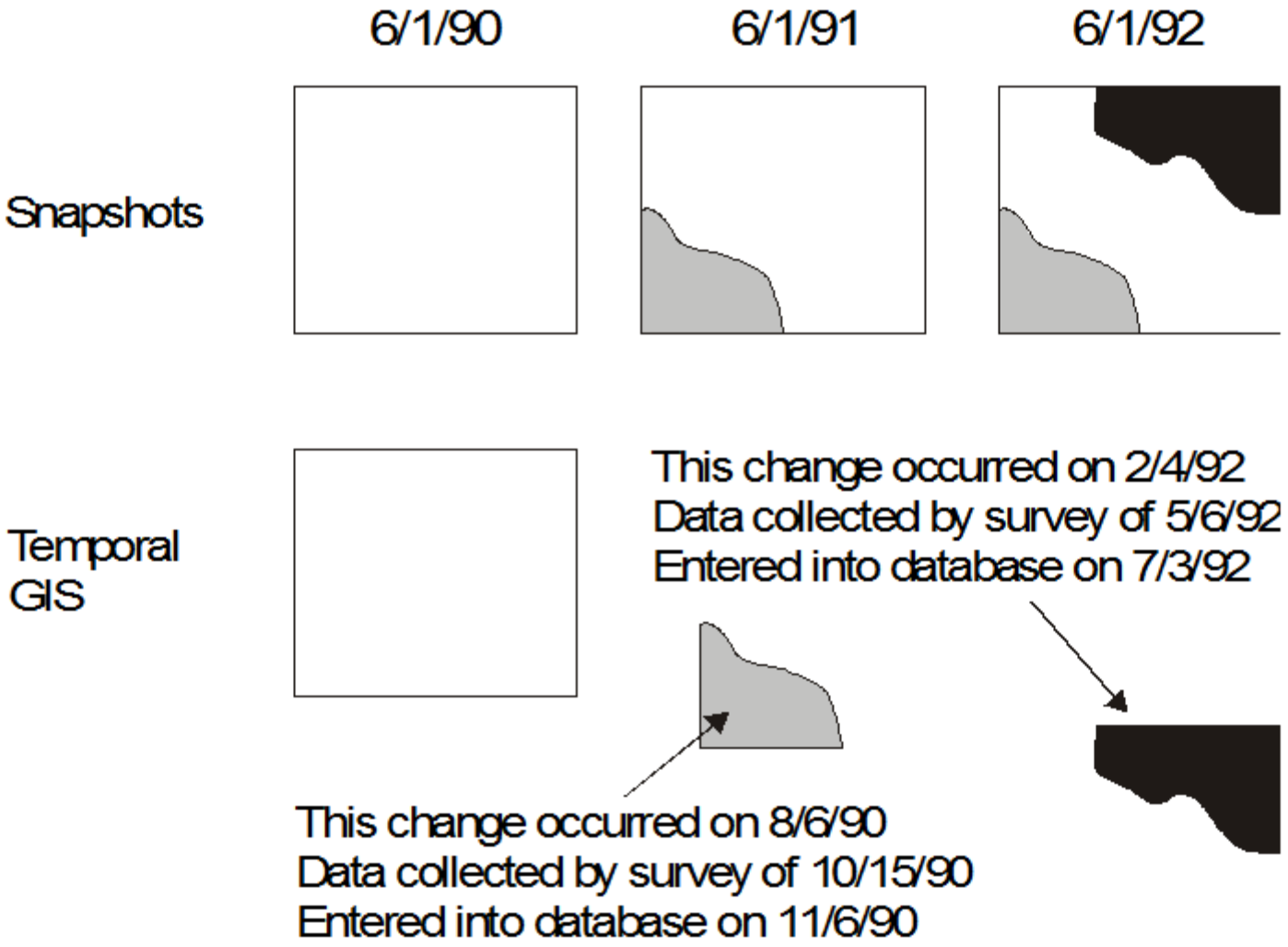


World and database times

Temporal database theory makes an important distinction between

- the time when events actually occur or become effective
- the time when these events are recorded by the database.

Base state with amendments



Levels of Change detection

- 1st level

General changed and unchanged areas (changed and persistent areas)

- 2nd level

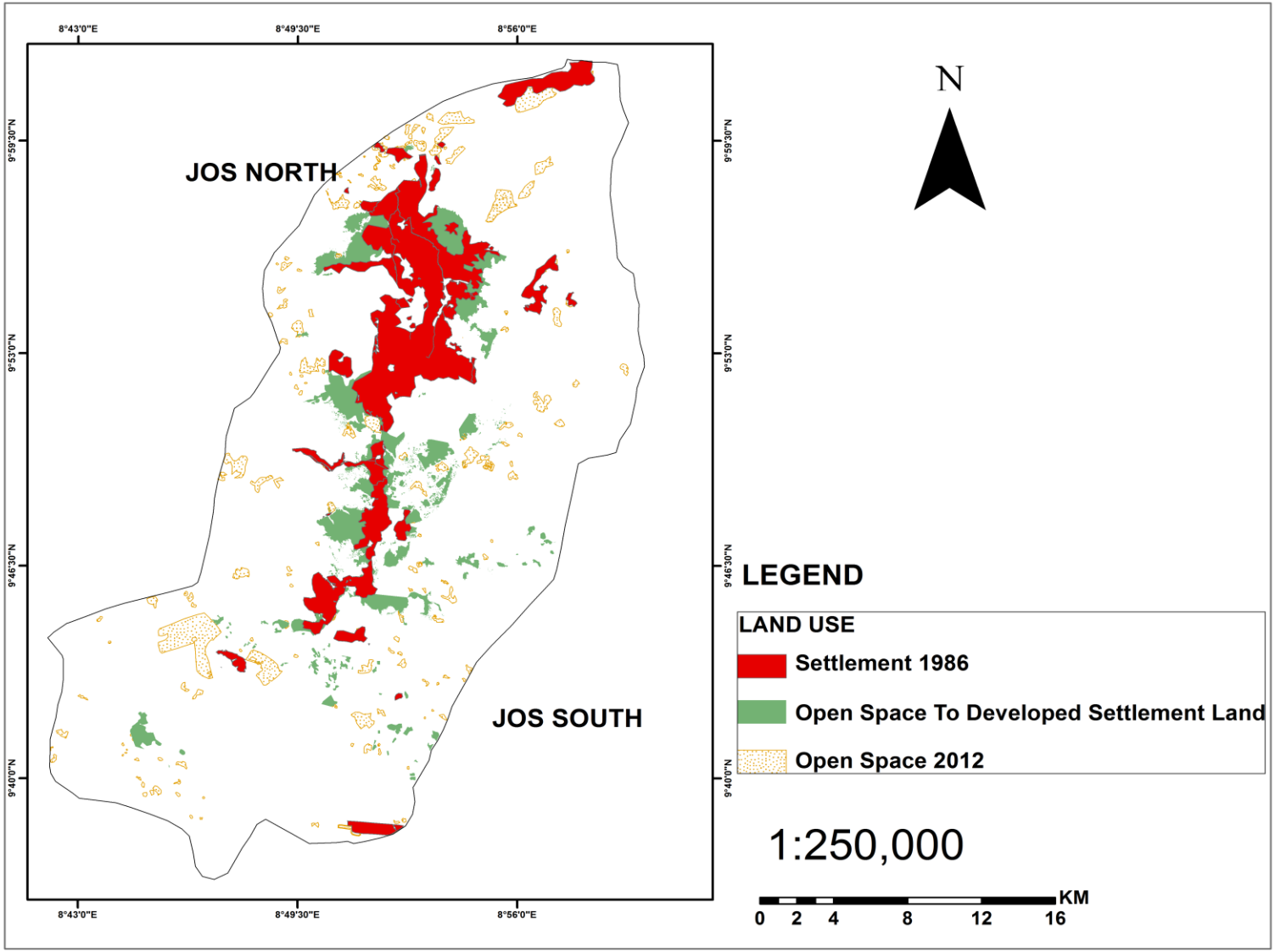
Overall changed and persistent areas in all the classes

- 3rd level

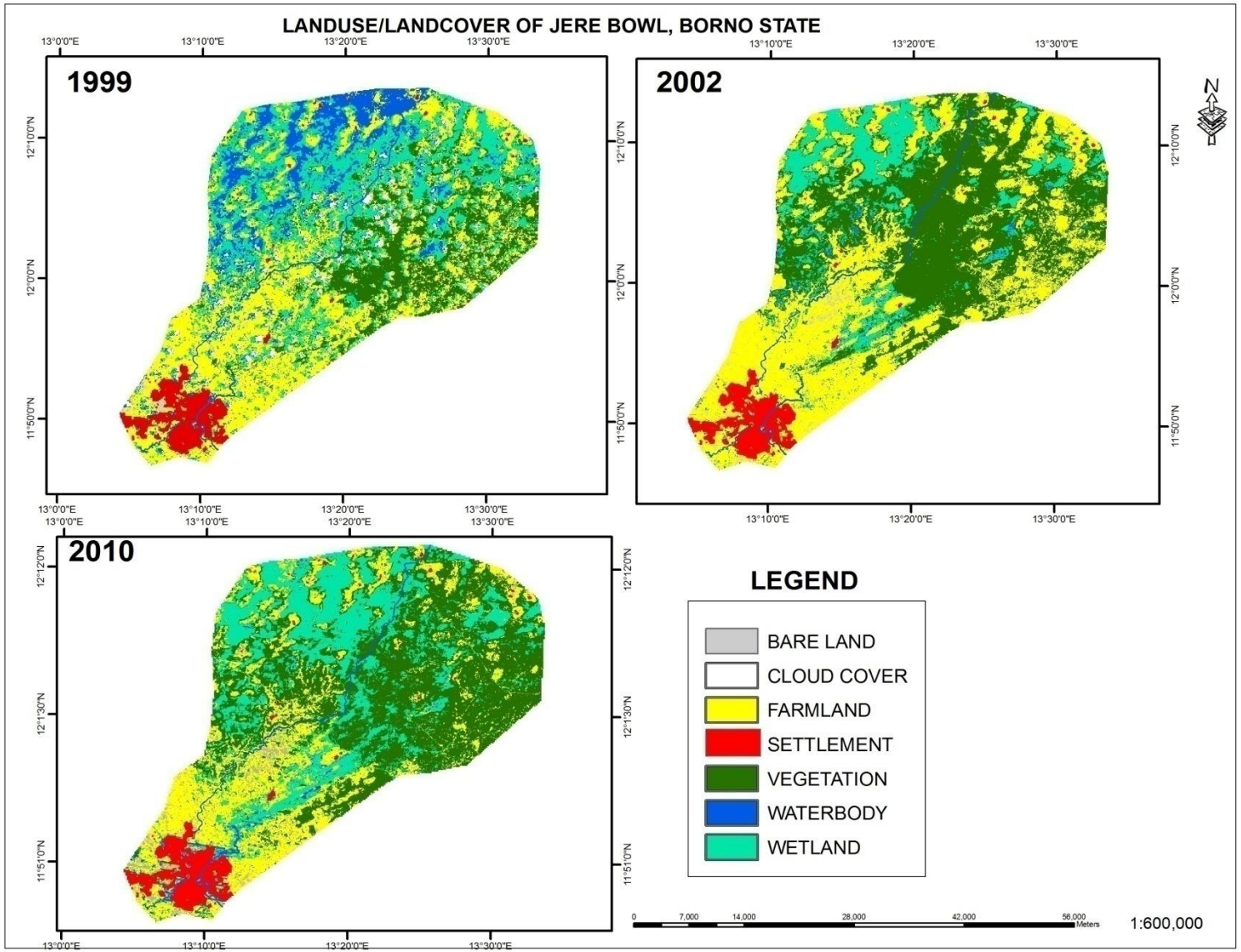
What has changed from what to what

Some examples of change detection

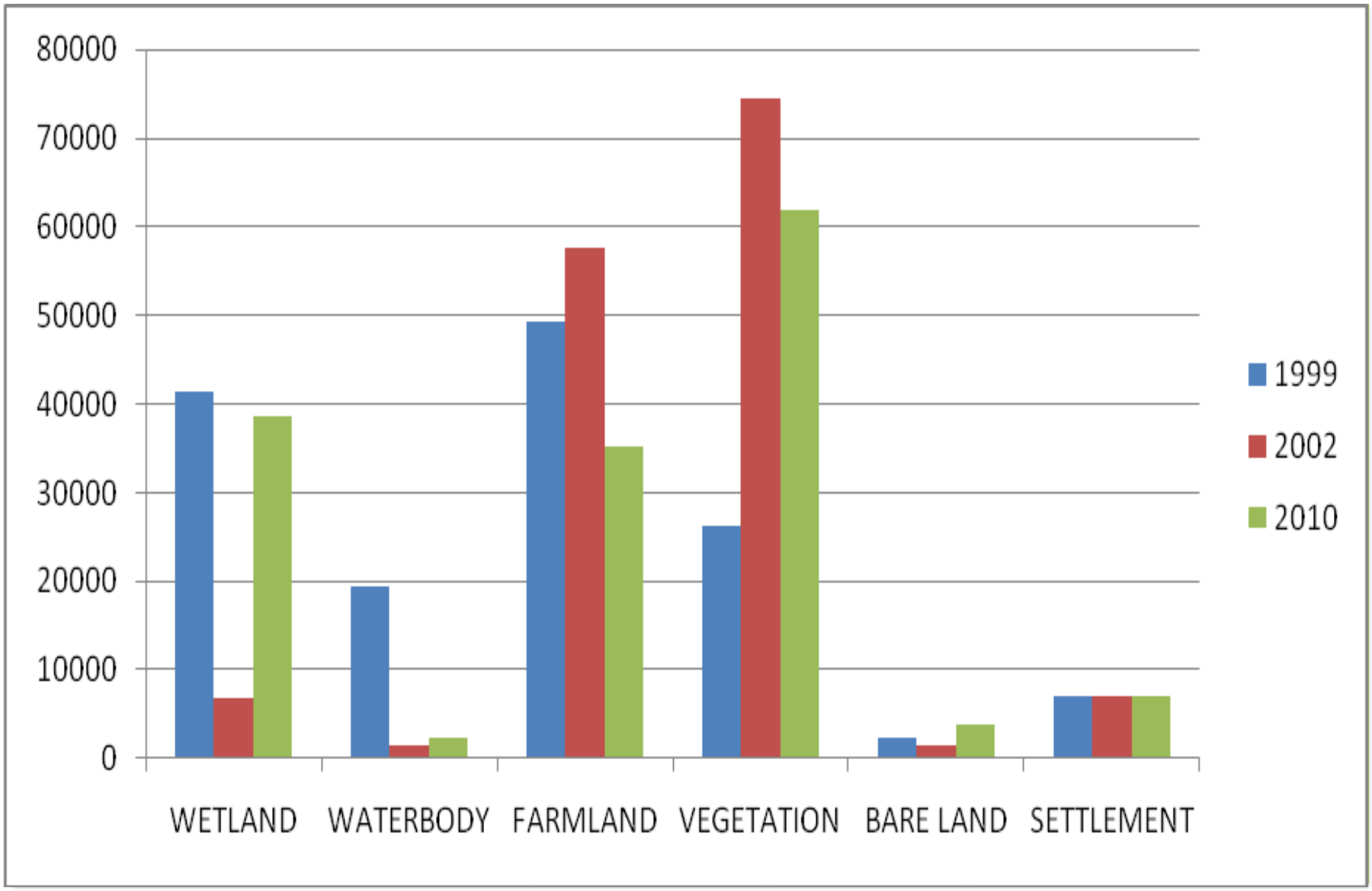

Legend
1 | 1
2 | 1
3 | 1
4 | 1
5 | 1
6 | 1
1 | 2
2 | 2
3 | 2
4 | 2
5 | 2
6 | 2
1 | 3
2 | 3
3 | 3
4 | 3
5 | 3
6 | 3
1 | 4
2 | 4
3 | 4
4 | 4
5 | 4
6 | 4
1 | 5
2 | 5
3 | 5
4 | 5
5 | 5
6 | 5
1 | 6
2 | 6
3 | 6
4 | 6
5 | 6
6 | 6


8°43'0"E
8°49'30"E
8°56'0"E
9°59'30"N
9°53'0"N
9°46'30"N
9°40'0"N
JOS NORTH
JOS SOUTH
N
LEGEND
LAND USE
Settlement 1986
Open Space To Developed Settlement Land
Open Space 2012
1:250,000
KM
0 2 4 8 12 16

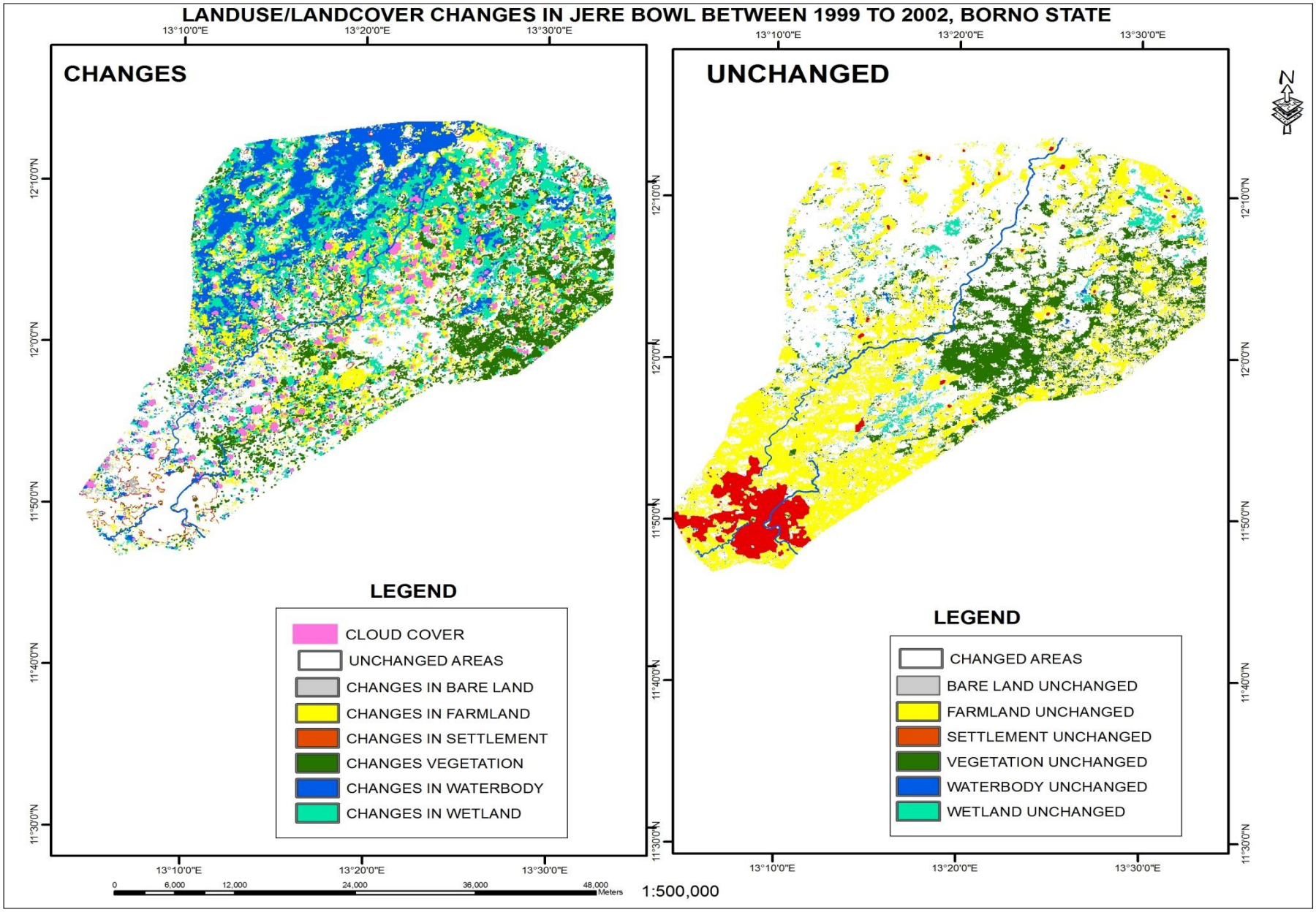
Vegetation change analysis



Vegetation change analysis



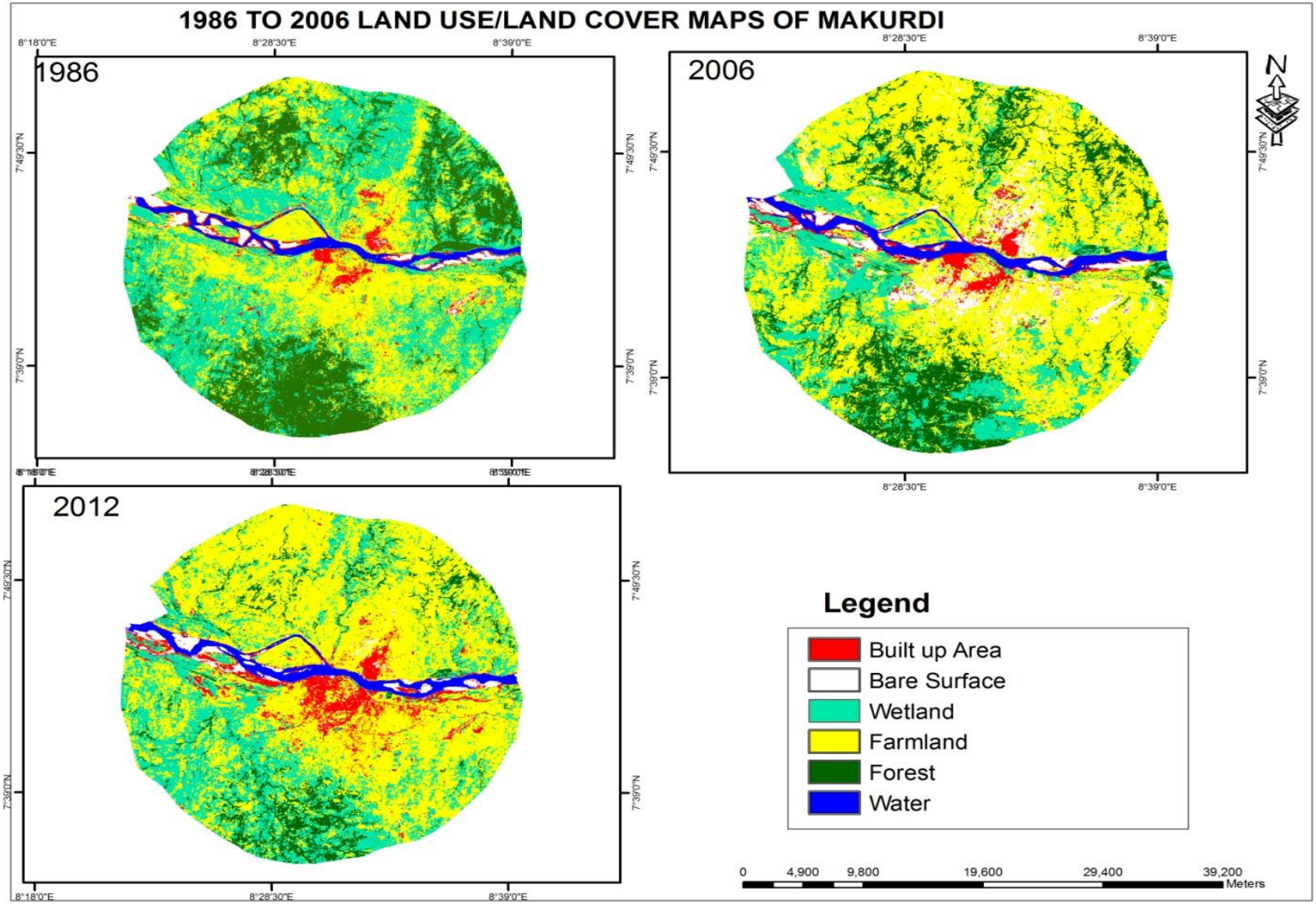
CHANGE DETECTION



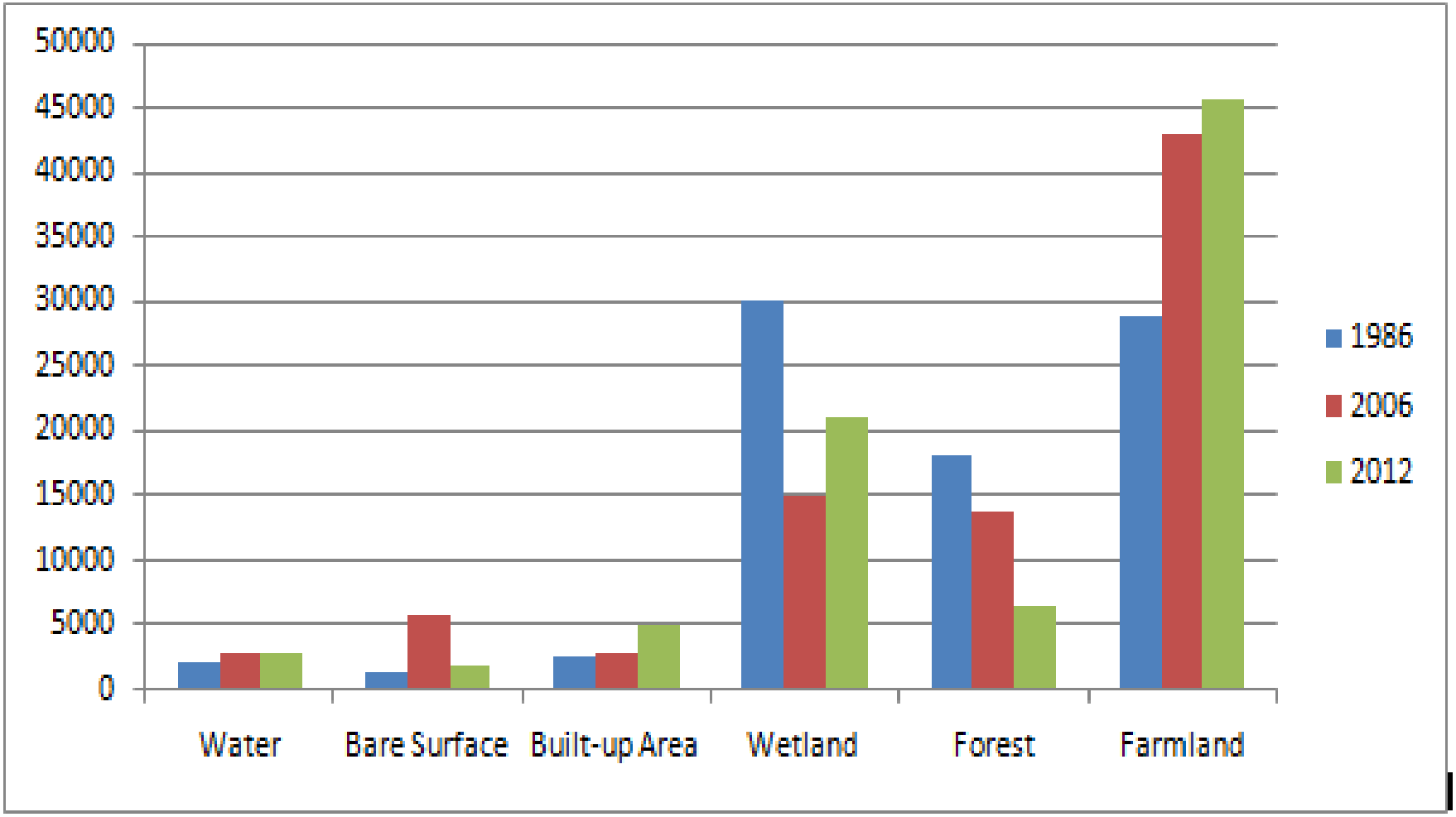
Cross table

CLASSES	1999							
2002	BARE LAND	CLOUD COVER	FARMLAND	SETTLEMENT	VEGETATION	WATERBODY	WETLAND	Grand Total
BARE LAND	1824544	305599.1	11218654.66	67429.8254	22334.91504	1561705.2	530986.21	**15531254.2**
FARMLAND	14920910	12392969	363018695.7	1836503.54	65391602.75	37451124	80364591	**575376395**
SETTLEMENT	118890.5	35258.02	1600953.023	67628253.5	64638.84554	260191.12	220974.83	**69929159.9**
VEGETATION	5763876	17475533	100753346.6	122863.767	192774261.4	133248835	294945038	**745083753**
WATERBODY	240329.6	386217.7	5538225.401	242076.12	205857.0389	4646997.9	3622474.9	**14882178.6**
WETLAND	297351.2	1204437	11295352.56	76023.5994	4074102.988	16219949	34363579	**67530795.5**
Grand Total	**23165902**	**31800013**	**493425227.9**	**69973150.4**	**262532797.9**	**193388802**	**414047643**	**1488333536**

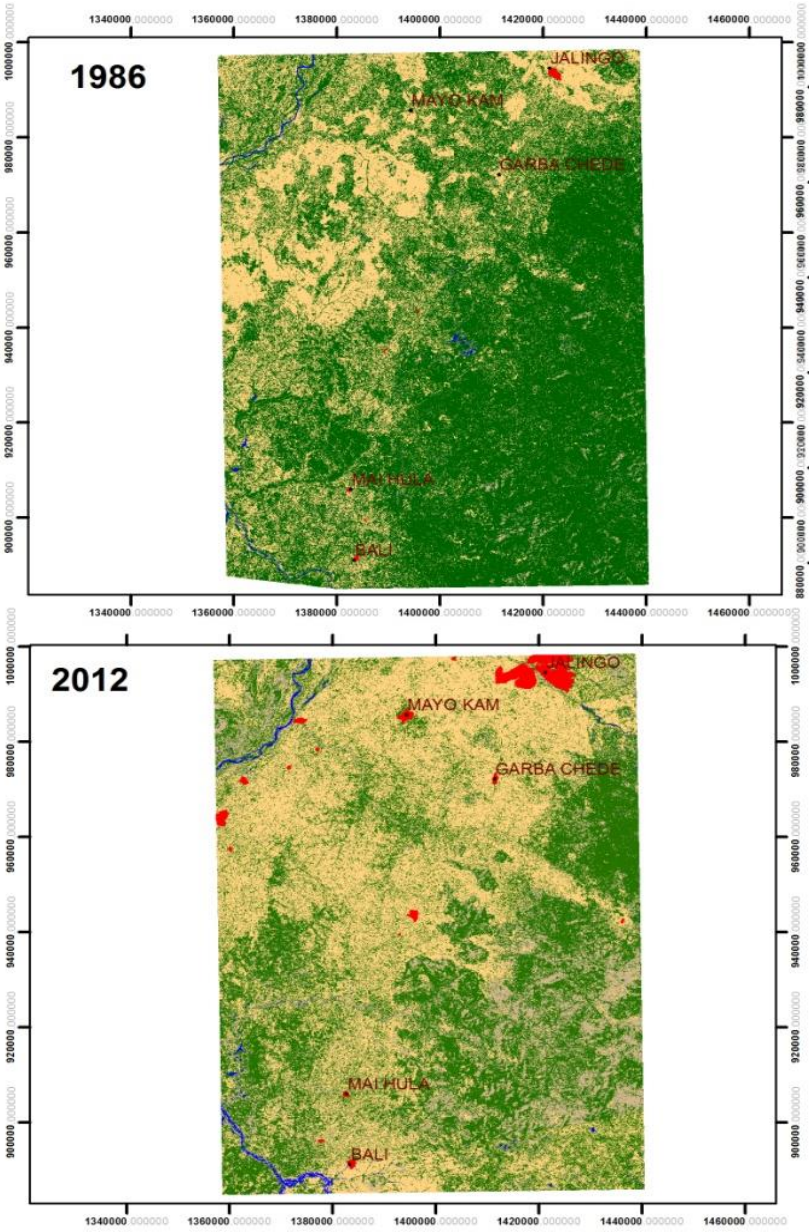
Wetland change analysis



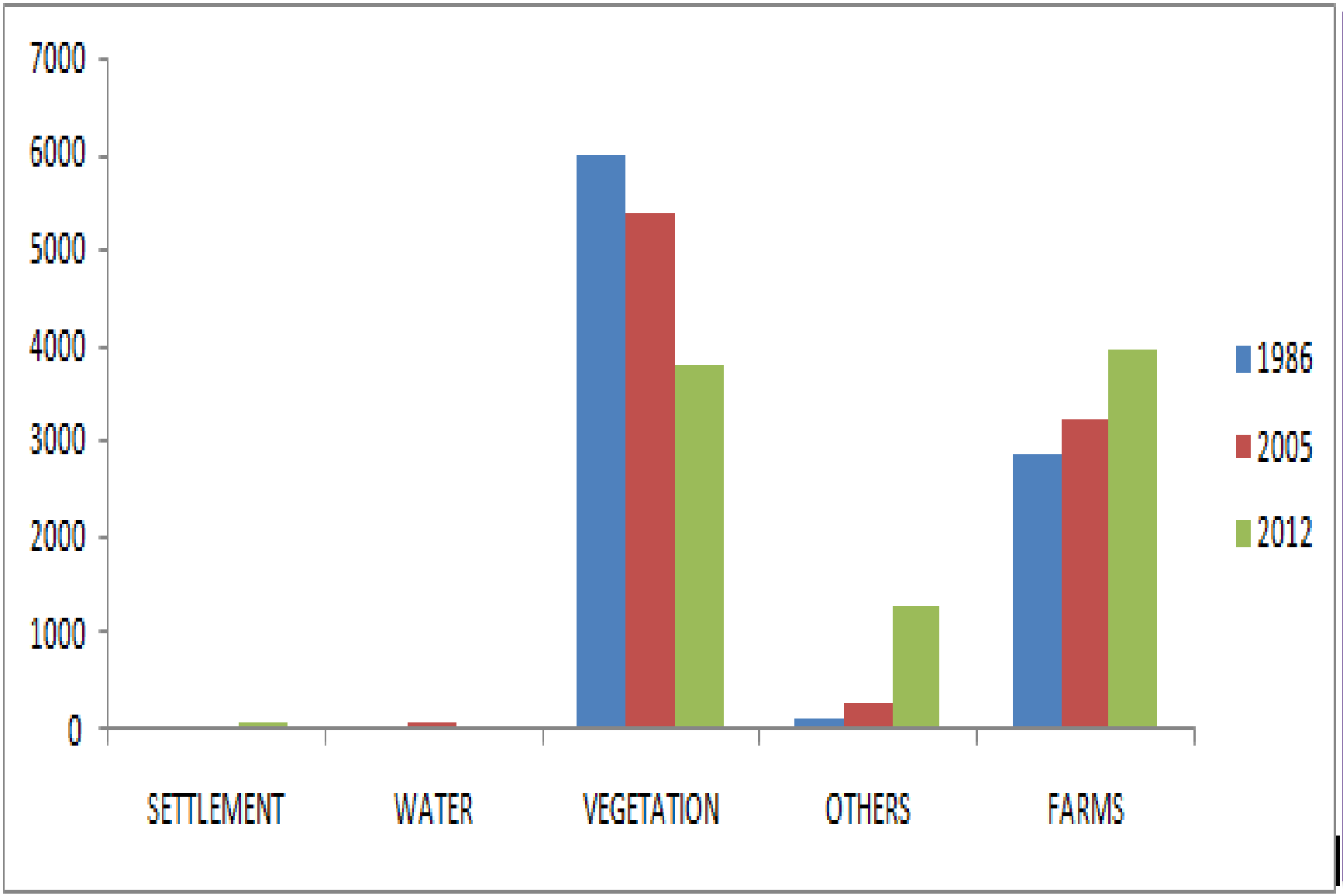
Wetland change analysis



Settlement change analysis



Settlement change analysis



CHANGE DETECTION

WHAT IS THE DIFFERECE BETWEEN RASTER

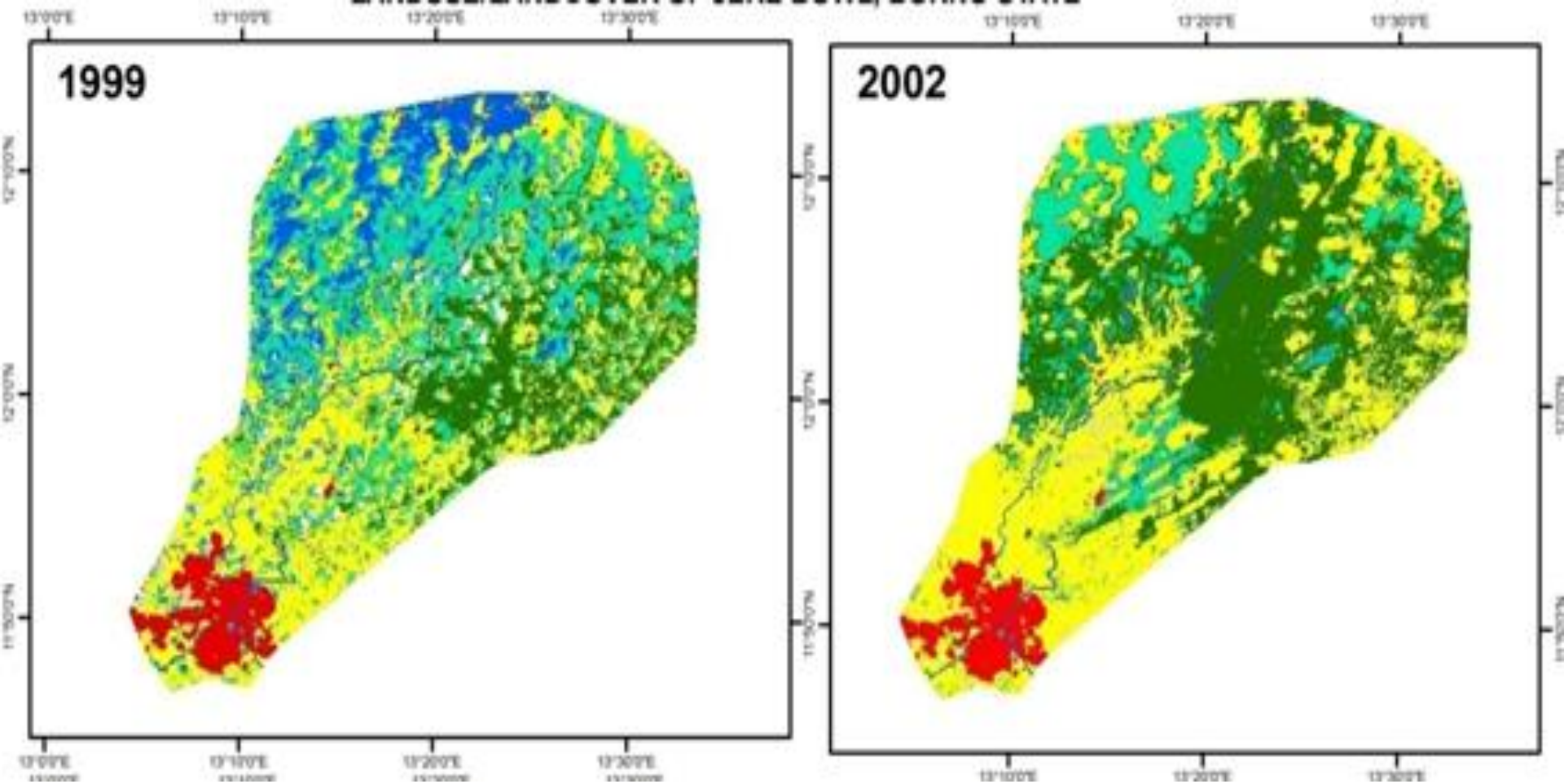
AND VECTOR DATA

ARC GIS - SUITABLE FOR CHANGE DETECTION USING VECTOR DATA

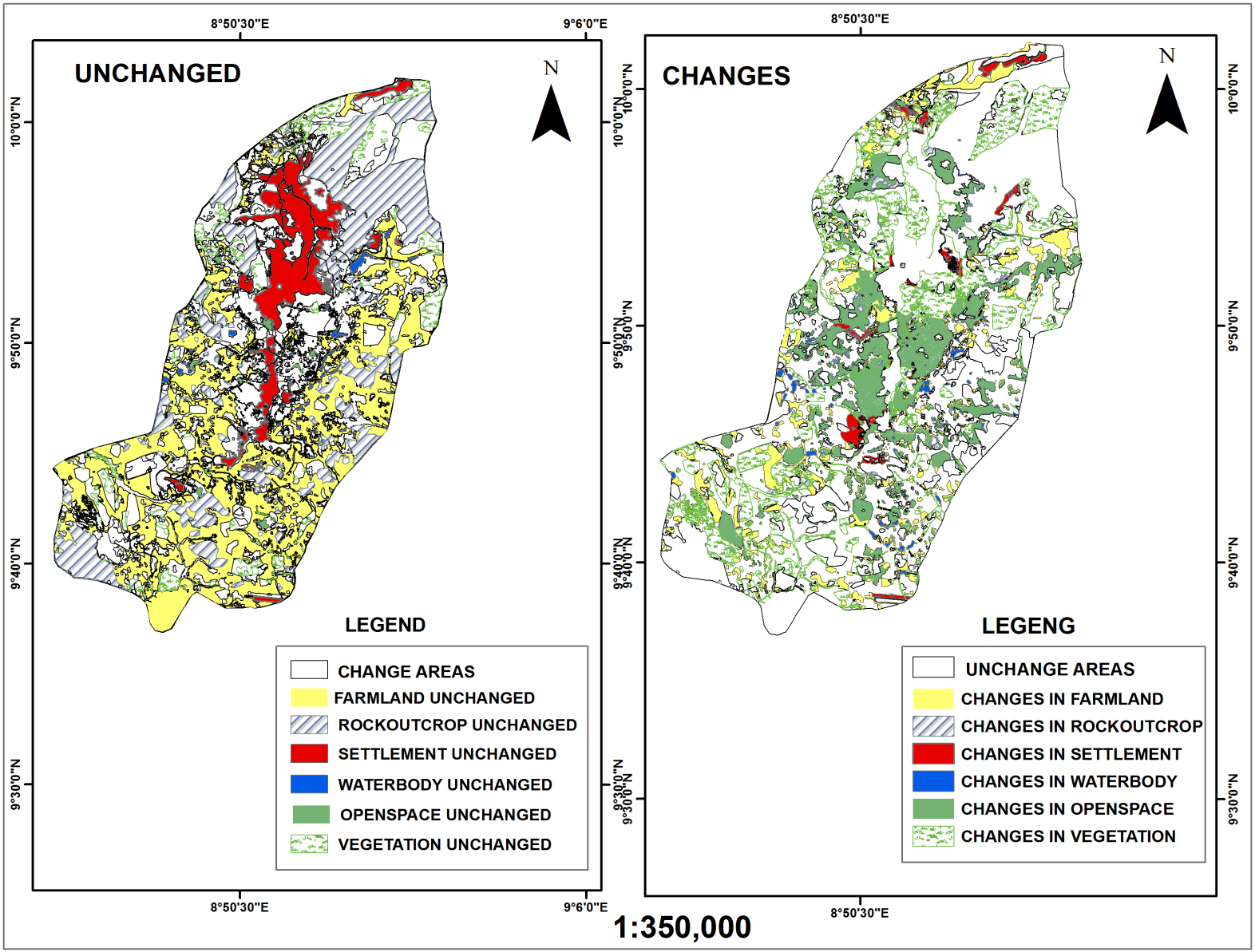
Q GIS - SUITABLE FOR CHANGE DETECTION USING VECTOR DATA AND RASTER

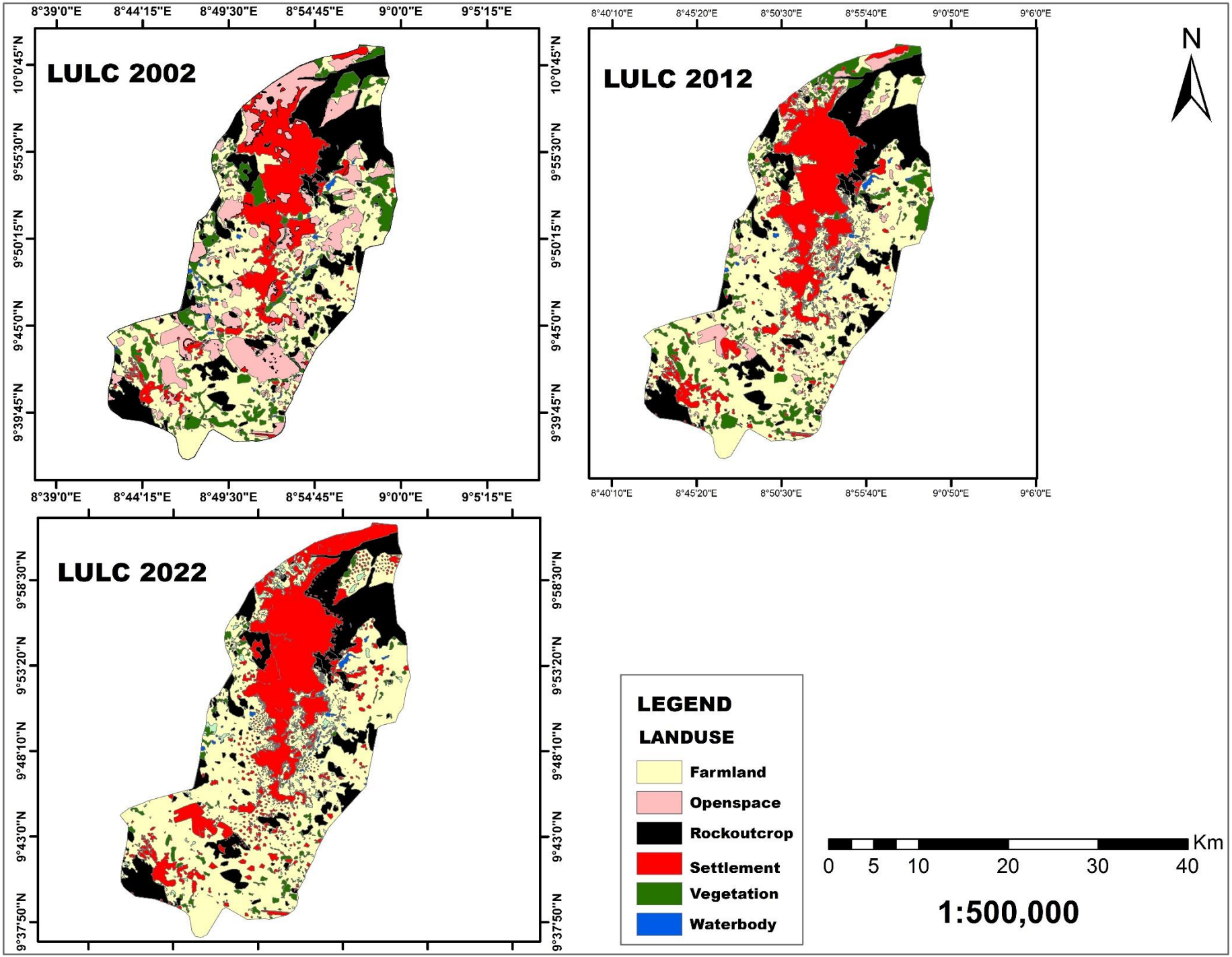
ERDAS IMAGINE- SUITABLE FOR CHANGE DETECTION USING RASTER DATA

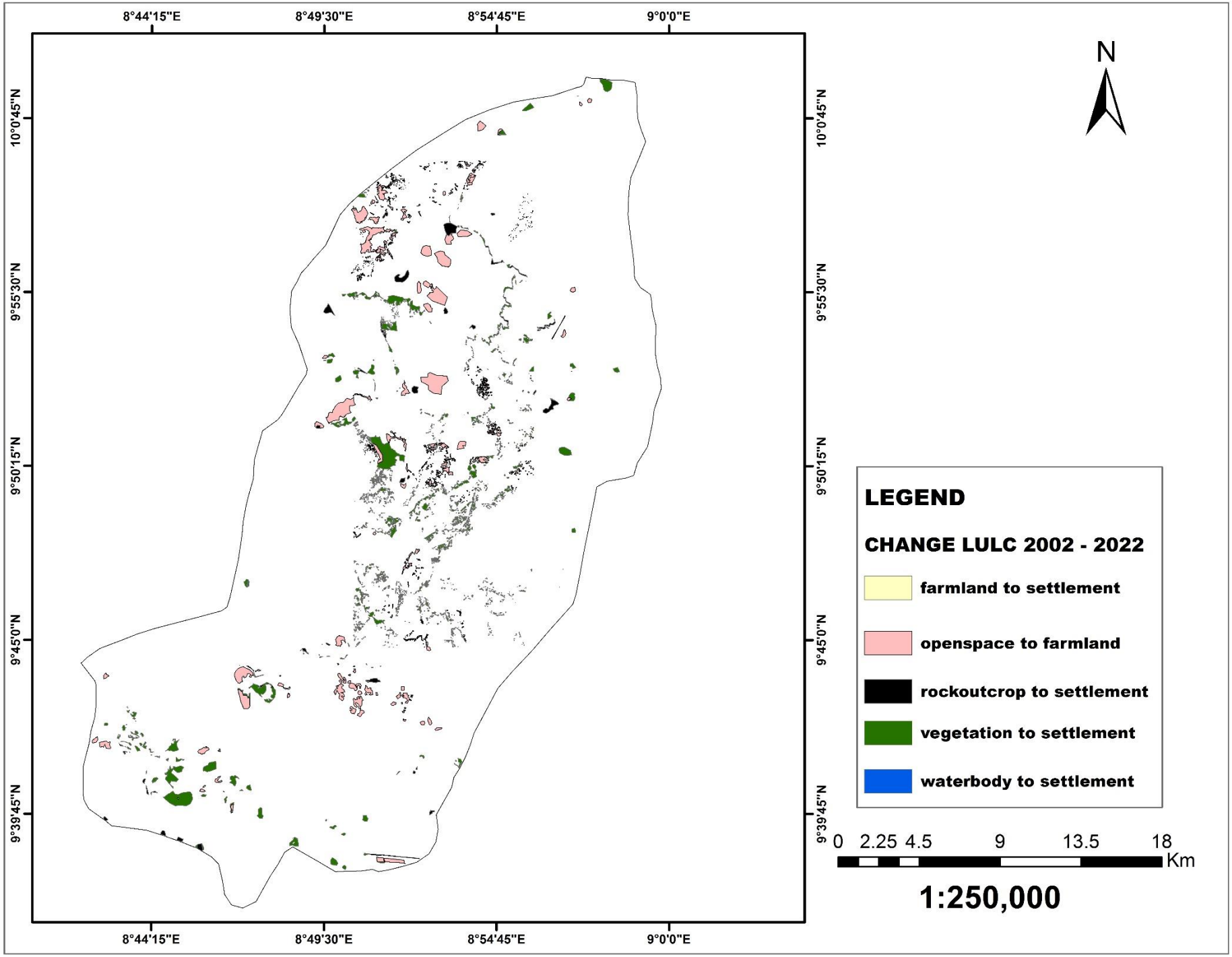
IDRISI SELVA-SUITABLE FOR CHANGE DETECTION USING RASTER DATER

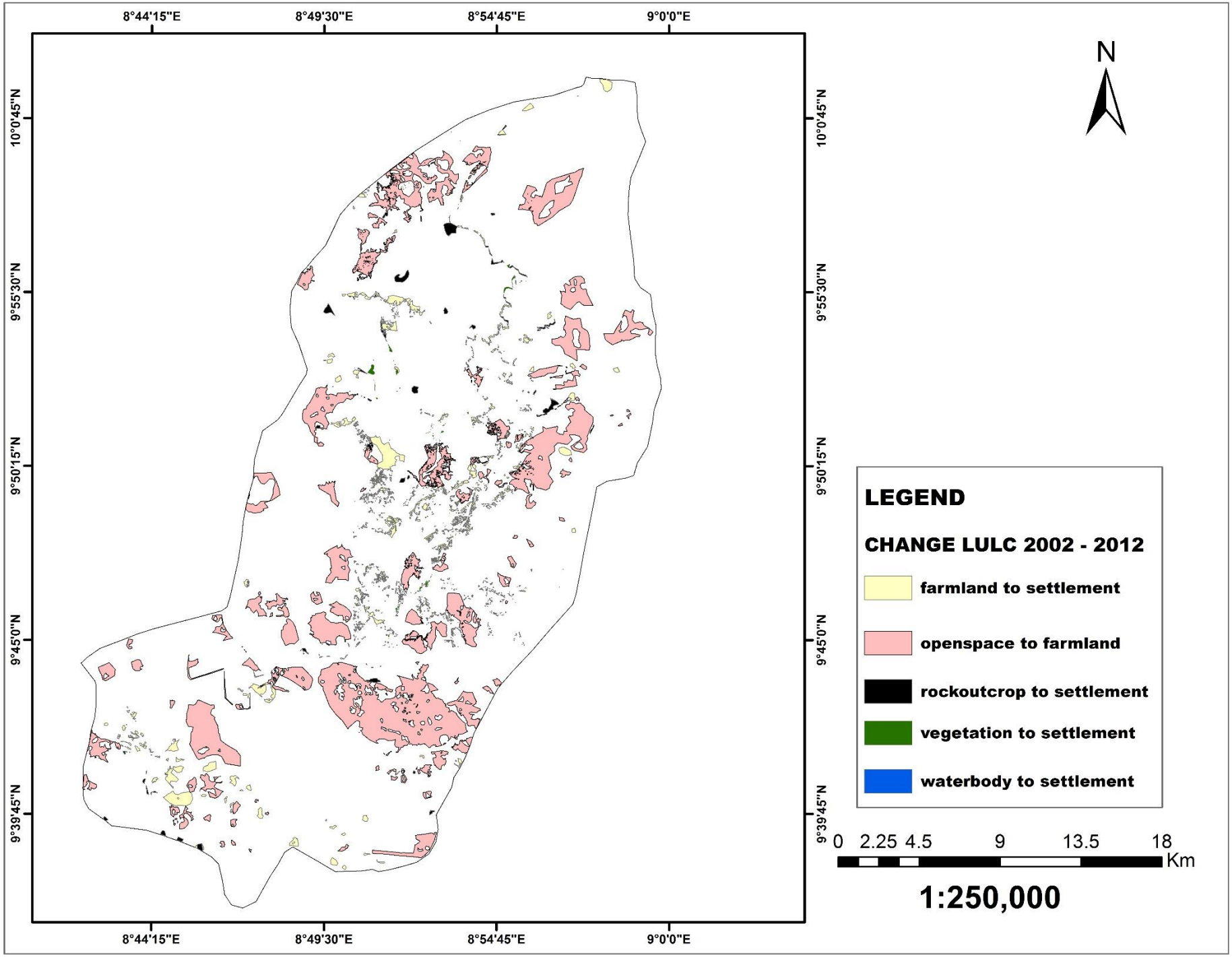


CHANGE DETECTION MAPPING


UNCHANGED
N
8°50'30"E
9°6'0"E
10°0'0"N
9°50'0"N
9°40'0"N
9°30'0"N
LEGEND
CHANGE AREAS
FARMLAND UNCHANGED
ROCKOUTCROP UNCHANGED
SETTLEMENT UNCHANGED
WATERBODY UNCHANGED
OPENSPACE UNCHANGED
VEGETATION UNCHANGED
CHANGES
LEGENG
UNCHANGE AREAS
CHANGES IN FARMLAND
CHANGES IN ROCKOUTCROP
CHANGES IN SETTLEMENT
CHANGES IN WATERBODY
CHANGES IN OPENSPACE
CHANGES IN VEGETATION
1:350,000


LULC 2002
LULC 2012
LULC 2022
8°39'0"E
8°44'15"E
8°49'30"E
8°54'45"E
9°0'0"E
9°5'15"E
8°40'10"E
8°45'20"E
8°50'30"E
8°55'40"E
9°0'50"E
9°6'0"E
10°0'45"N
9°55'30"N
9°50'15"N
9°45'0"N
9°39'45"N
9°58'30"N
9°53'20"N
9°48'10"N
9°43'0"N
9°37'50"N
N
LEGEND
LANDUSE
Farmland
Openspace
Rockoutcrop
Settlement
Vegetation
Waterbody
0 5 10 20 30 40
Km
1:500,000


8°44'15"E
8°49'30"E
8°54'45"E
9°0'0"E
10°0'45"N
9°55'30"N
9°50'15"N
9°45'0"N
9°39'45"N
N
LEGEND
CHANGE LULC 2002 - 2022
farmland to settlement
openspace to farmland
rockoutcrop to settlement
vegetation to settlement
waterbody to settlement
0 2.25 4.5 9 13.5 18
Km
1:250,000


8°44'15"E
8°49'30"E
8°54'45"E
9°0'0"E
10°0'45"N
9°55'30"N
9°50'15"N
9°45'0"N
9°39'45"N
N
LEGEND
CHANGE LULC 2002 - 2012
farmland to settlement
openspace to farmland
rockoutcrop to settlement
vegetation to settlement
waterbody to settlement
0 2.25 4.5 9 13.5 18
Km
1:250,000

THANK YOU