# Coastal Change in Poole and Christchurch Bays

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## Please Note

This presentation differs from that given at the Poole & Christchurch Bays Shoreline Management Plan workshops (February 2009).

Slide No's 44-57 have been removed due to copyright issues

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# Coastal processes

- Factors affecting change
  - Geology
  - Geomorphology
  - Waves
  - Tides
  - Currents
  - Management

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# Storm events

## Surges
## Atlantic depressions
## Hotspots

- December 1989
- December 1999
- March 2008

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# Land sliding and cliff stability


- Ground water
- Geology
- Sea erosion

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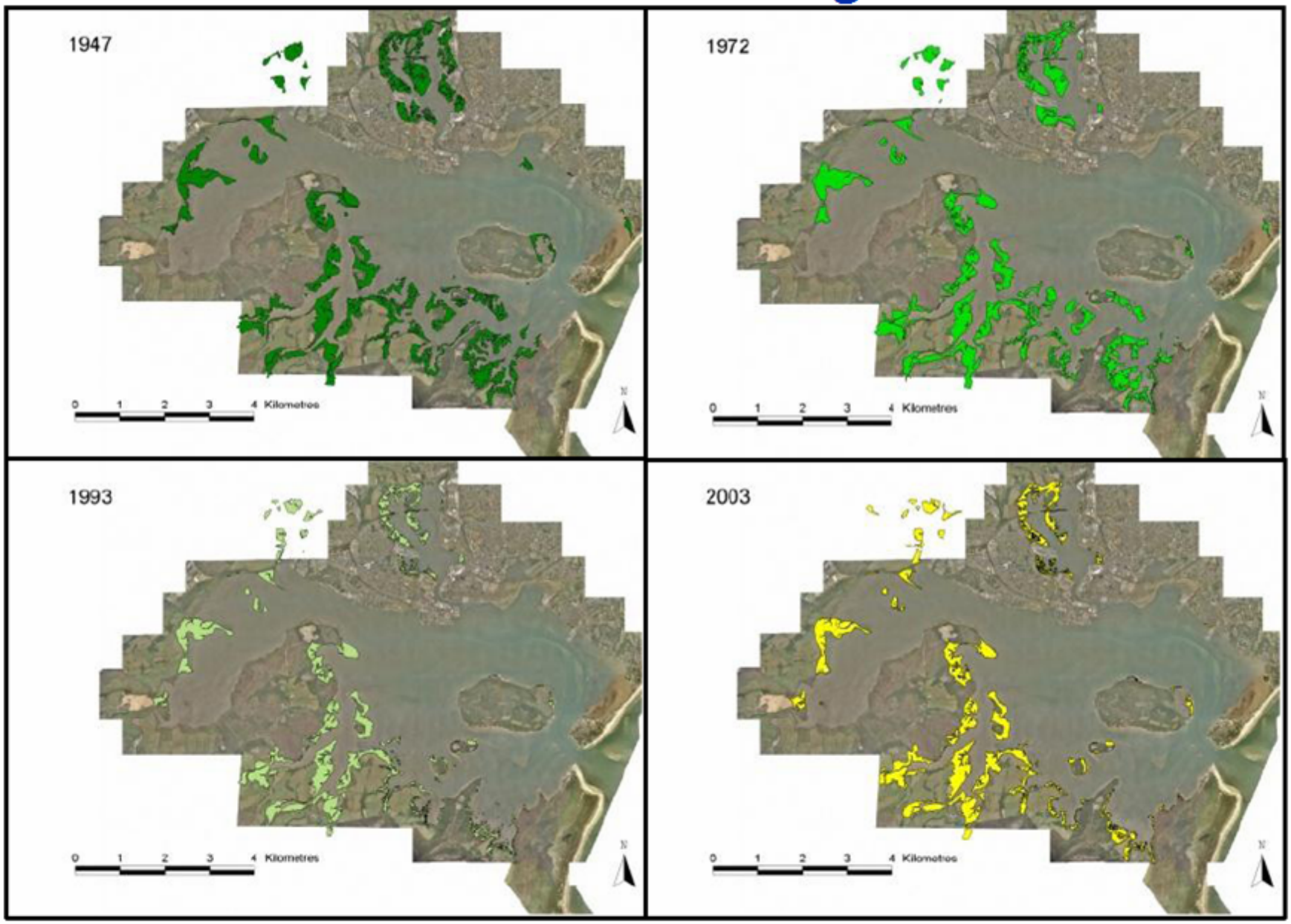
## •Measuring changes

# Saltmarsh change




Saltmarsh (38% of 1947 extent) between 1947-1993,

Reedbed increased by (63% of 1947 extent)

Bohn (2003), DERC (2003)

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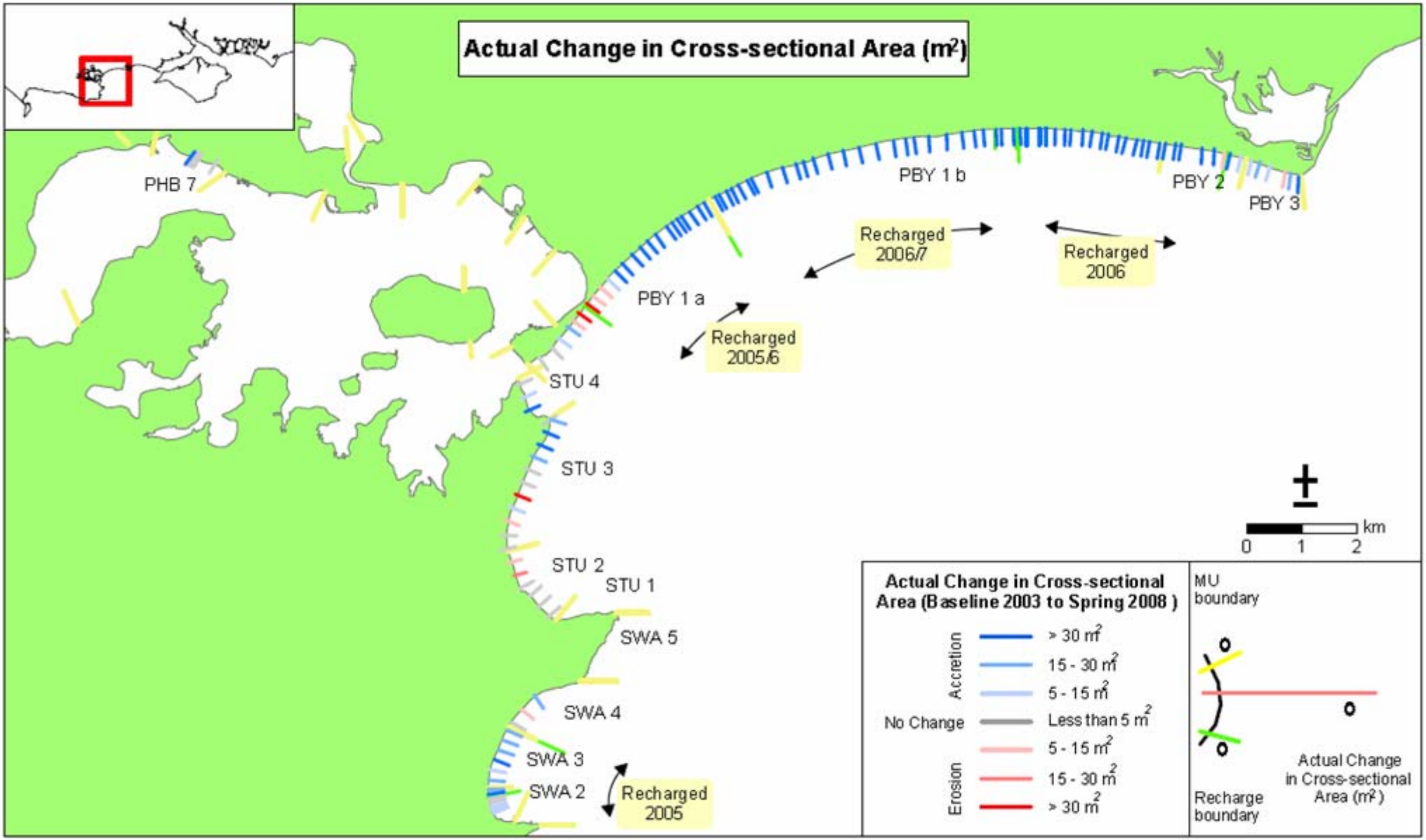
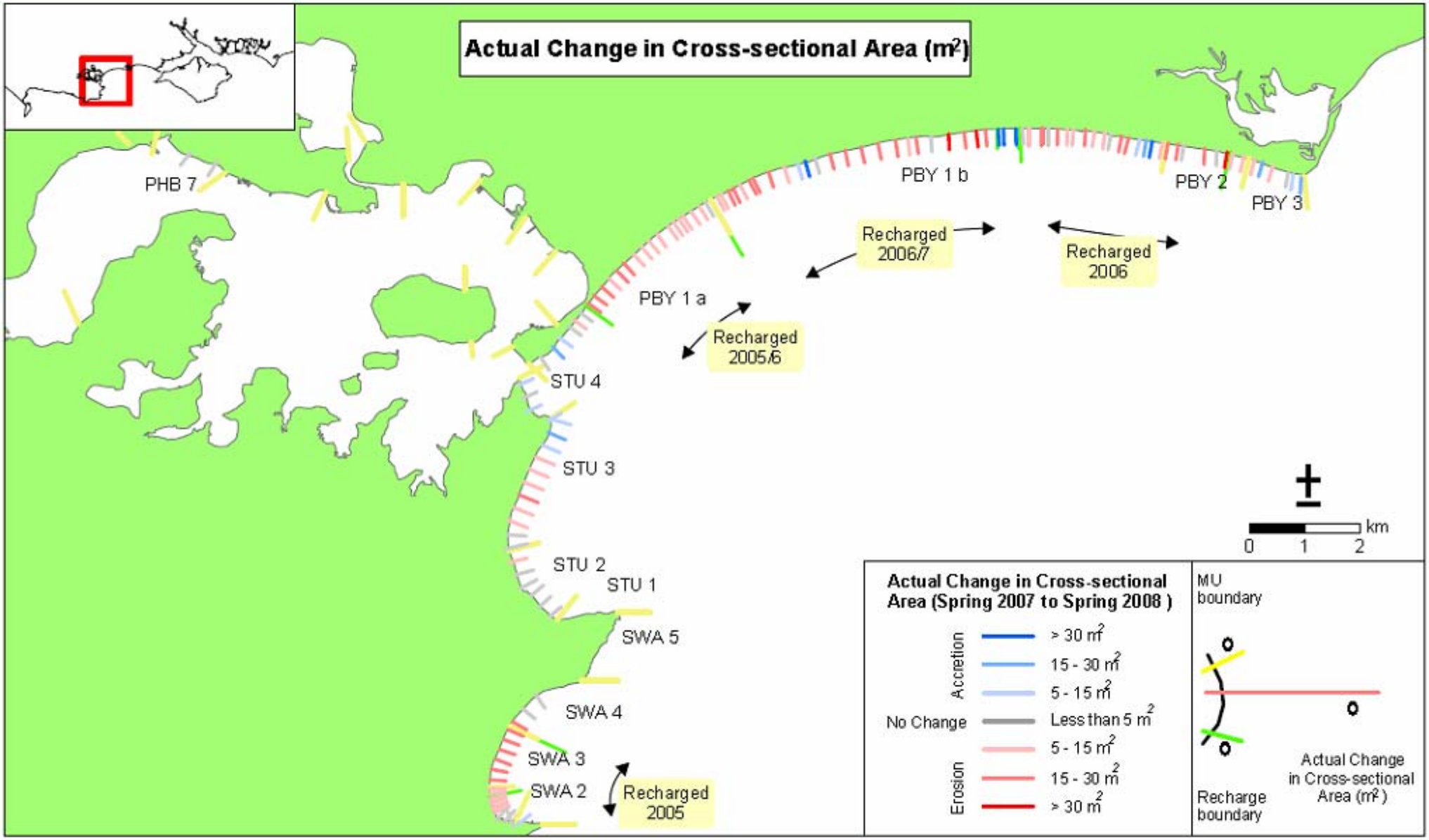
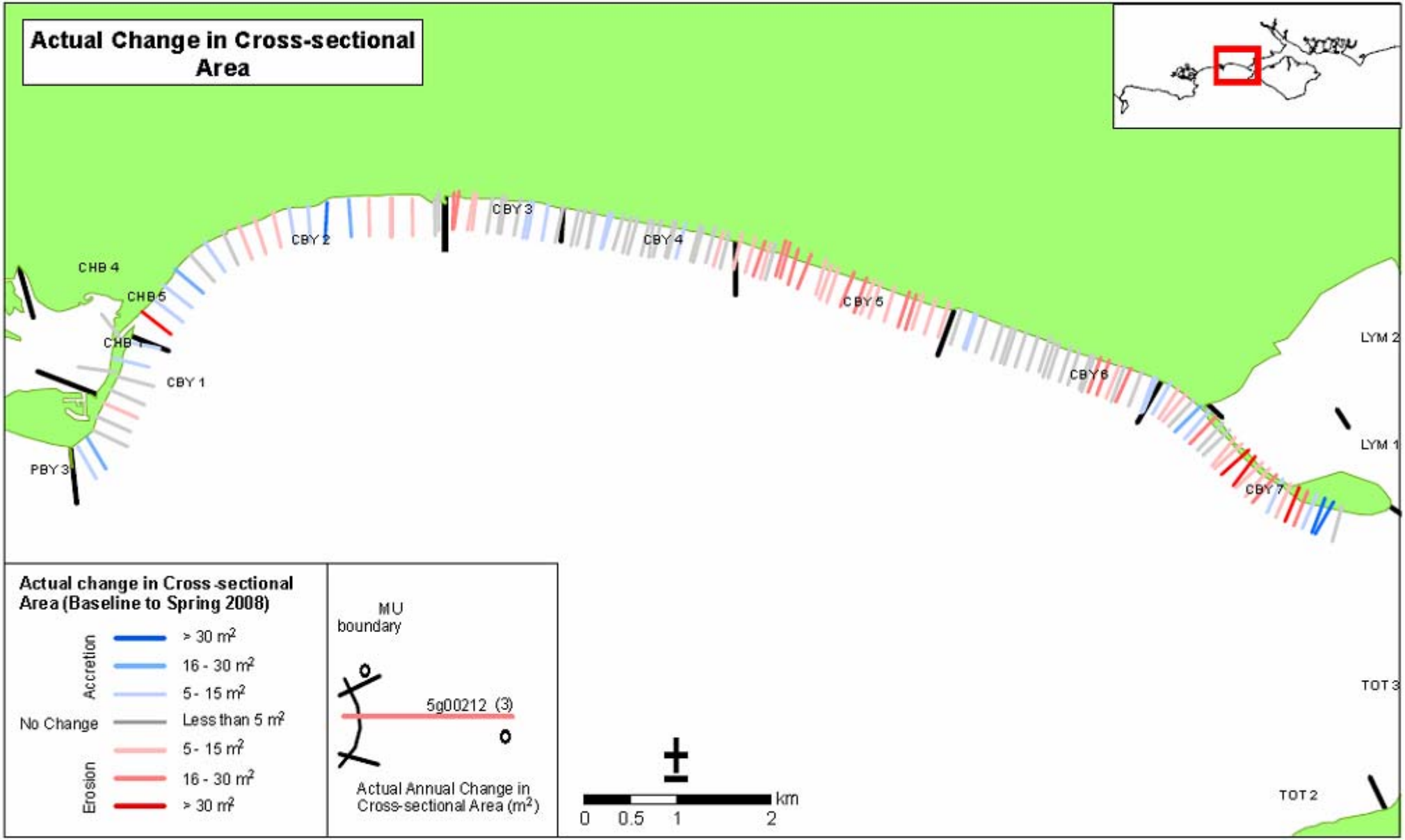

Actual Change in Cross-sectional Area (m²)
PHB 7
PBY 1 b
PBY 2
PBY 3
Recharged 2006/7
Recharged 2006
PBY 1 a
Recharged 2005/6
STU 4
STU 3
STU 2
STU 1
SWA 5
SWA 4
SWA 3
SWA 2
Recharged 2005
km
0 1 2
Actual Change in Cross-sectional Area (Baseline 2003 to Spring 2008 )
Accretion
> 30 m²
15 - 30 m²
5 - 15 m²
No Change
Less than 5 m²
Erosion
5 - 15 m²
15 - 30 m²
> 30 m²
MU boundary
Recharge boundary
Actual Change in Cross-sectional Area (m²)

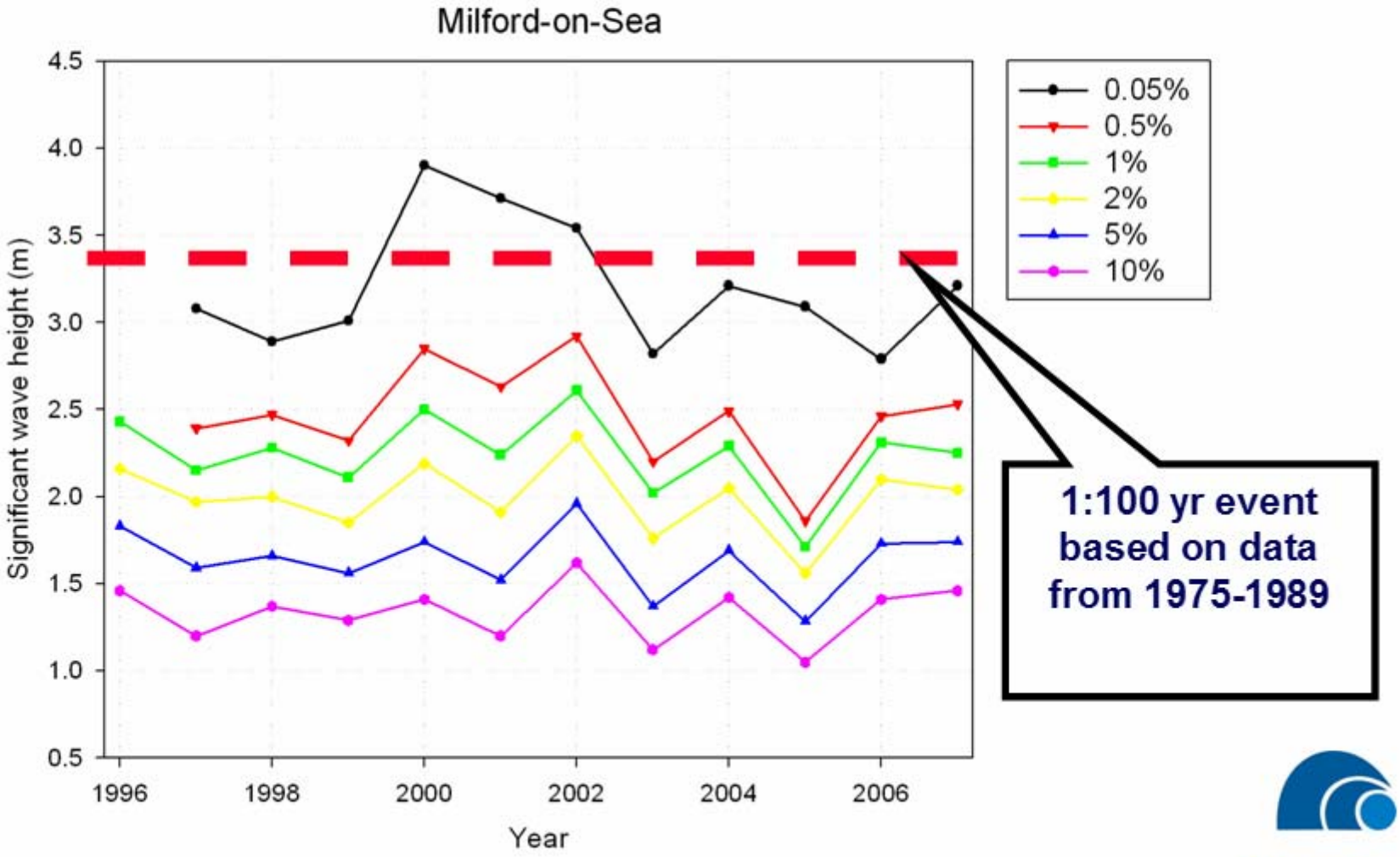



Actual Change in Cross-sectional Area
CBY 3
CBY 2
CBY 4
CHB 4
CHB 5
CBY 5
CHB 1
LYM 2
CBY 1
CBY 6
LYM 1
PBY 3
CBY 7
TOT 3
TOT 2
Actual change in Cross-sectional Area (Baseline to Spring 2008)
Accretion
> 30 m²
16 - 30 m²
5 - 15 m²
No Change
Less than 5 m²
Erosion
5 - 15 m²
16 - 30 m²
> 30 m²
MU boundary
5g00212 (3)
Actual Annual Change in Cross-sectional Area (m²)
km
0 0.5 1 2

# Measuring coastal change

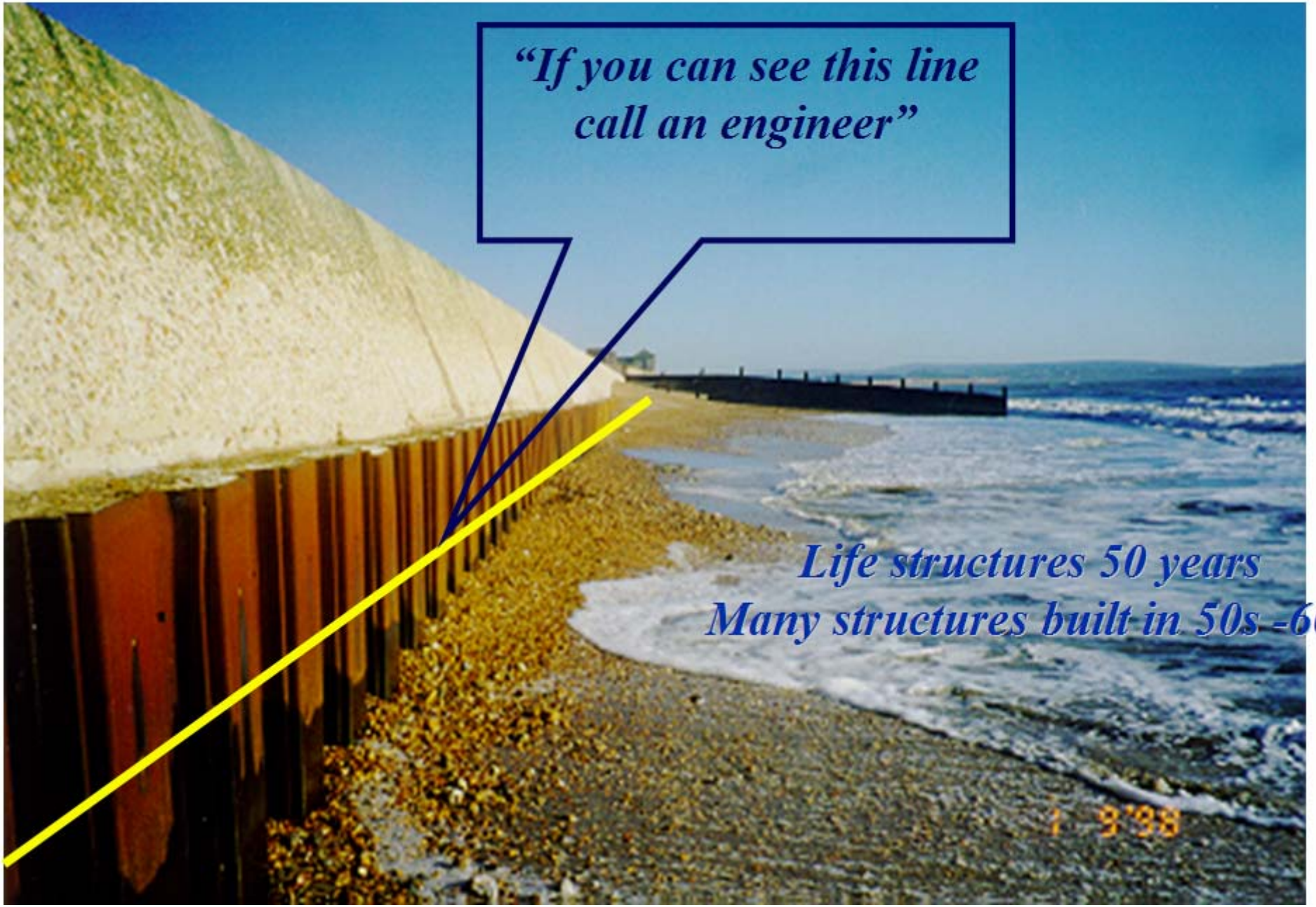

REX

# Is it getting more stormy? How do we know?

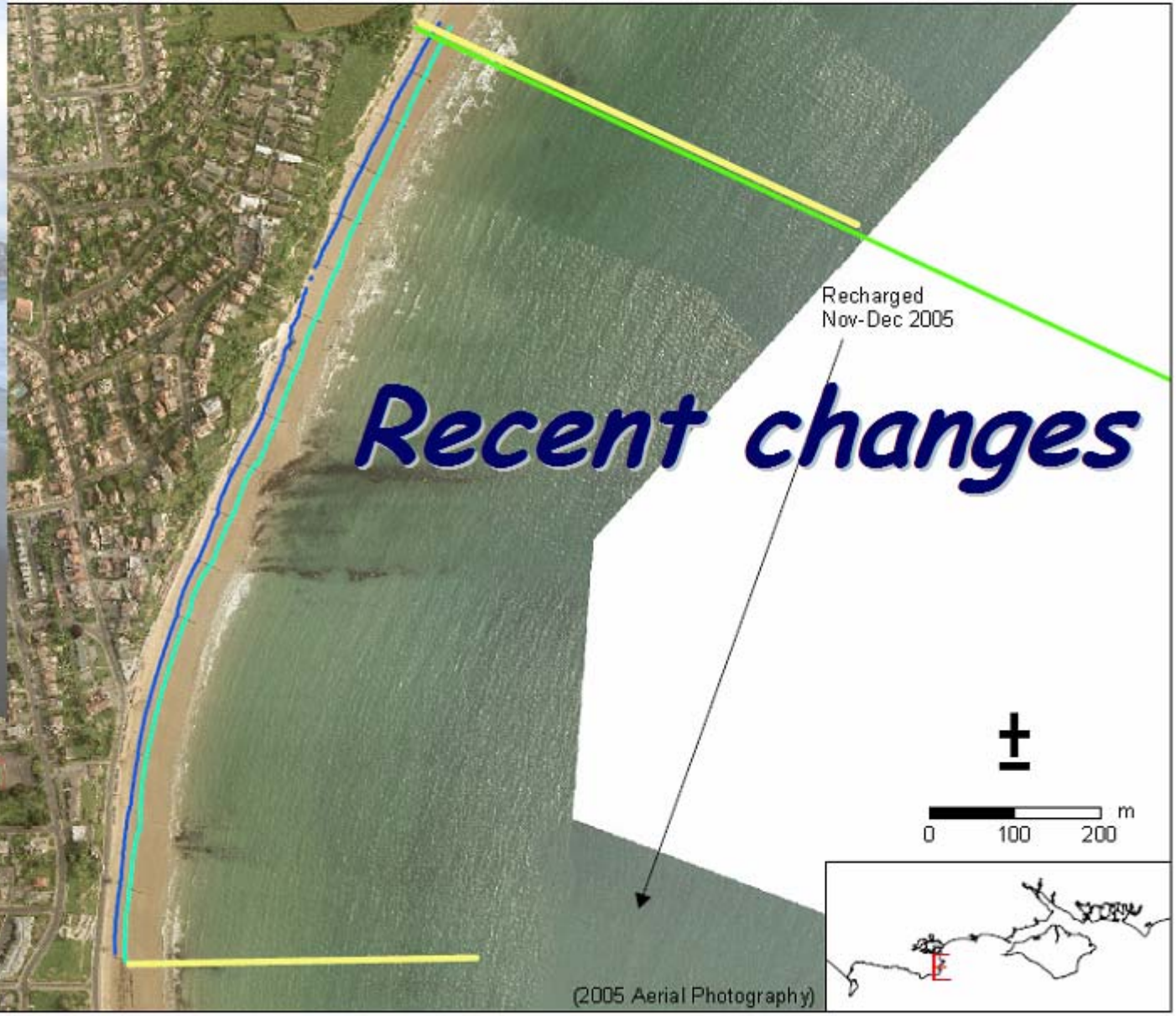


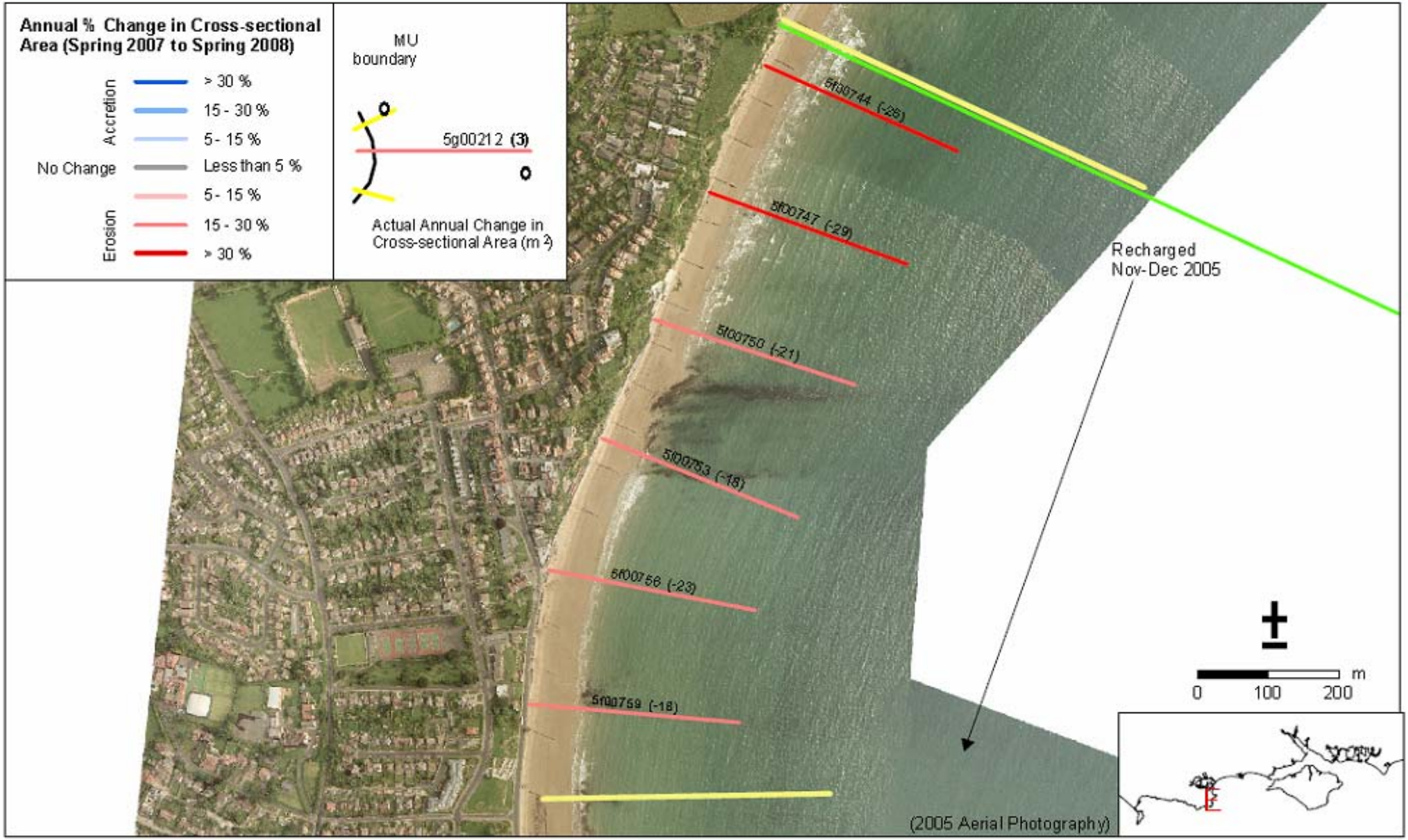
# Impacts of management on change

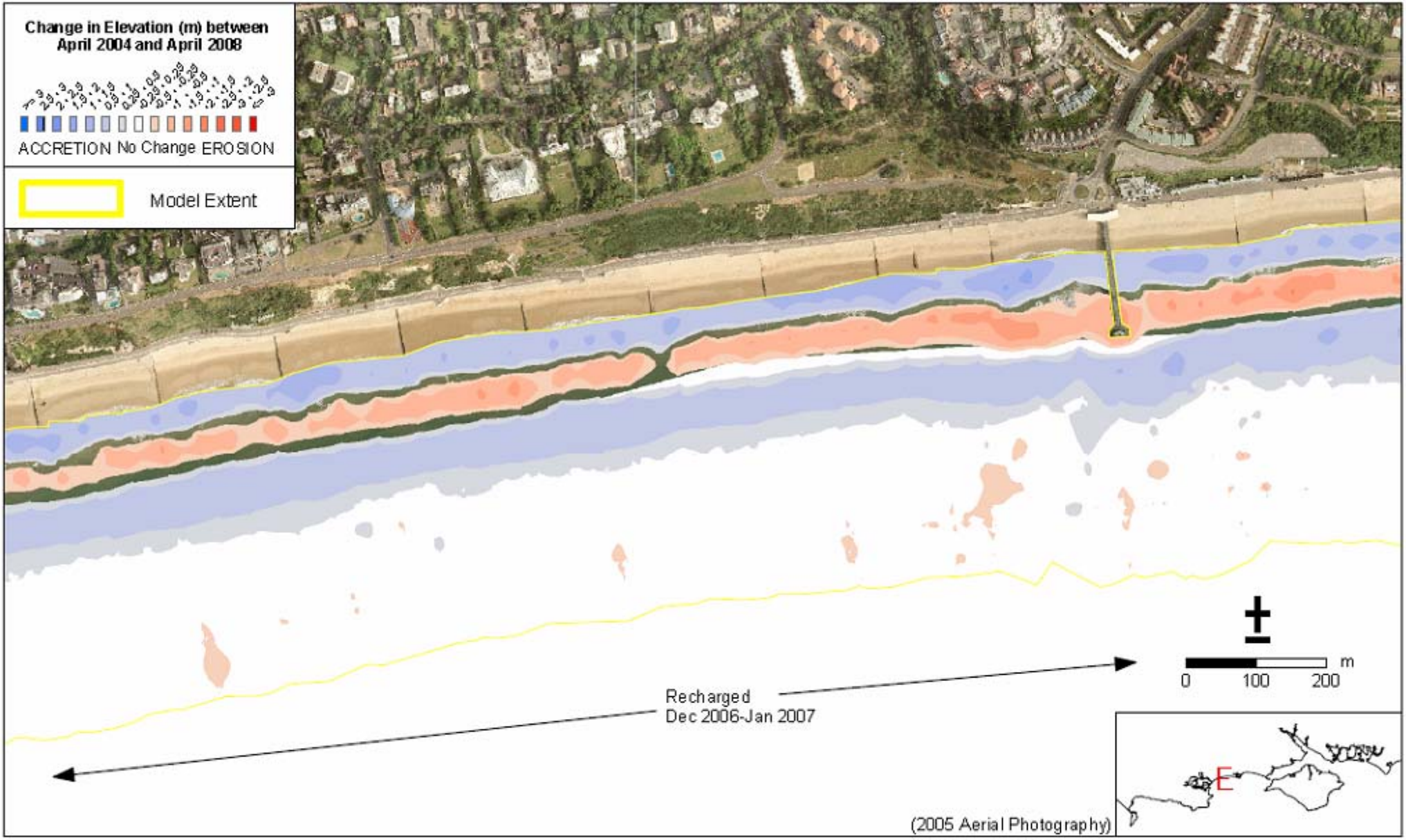
# Aging structures

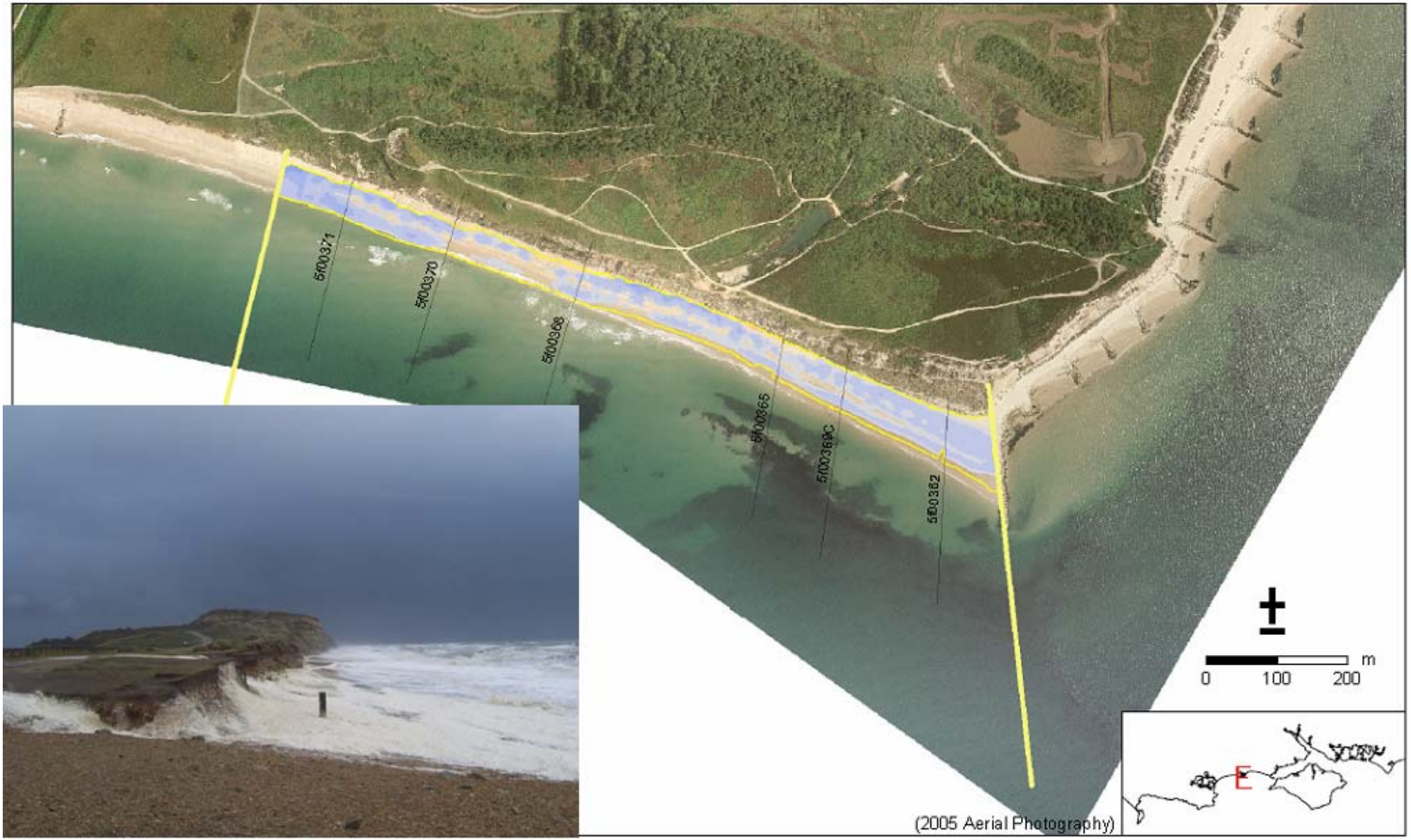


# Recent changes

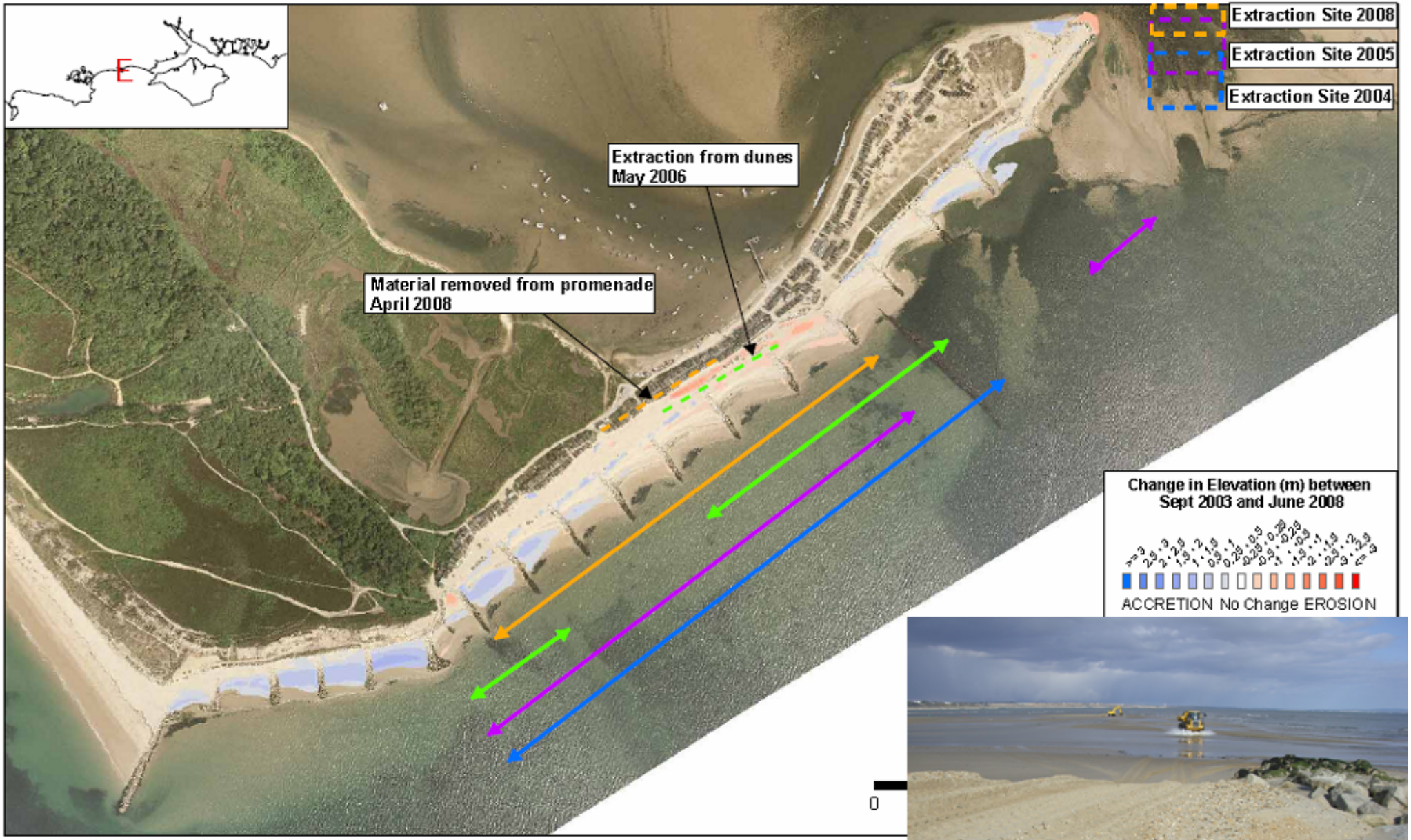



Annual % Change in Cross-sectional Area (Spring 2007 to Spring 2008)
Accretion
> 30 %
15 - 30 %
5 - 15 %
No Change
Less than 5 %
Erosion
5 - 15 %
15 - 30 %
> 30 %
MU boundary
5g00212 (3)
Actual Annual Change in Cross-sectional Area (m²)
5f00744 (-26)
5f00747 (-29)
5f00750 (-21)
5f00753 (-18)
5f00756 (-23)
5f00759 (-18)
Recharged Nov-Dec 2005
0
100
200
m
(2005 Aerial Photography)

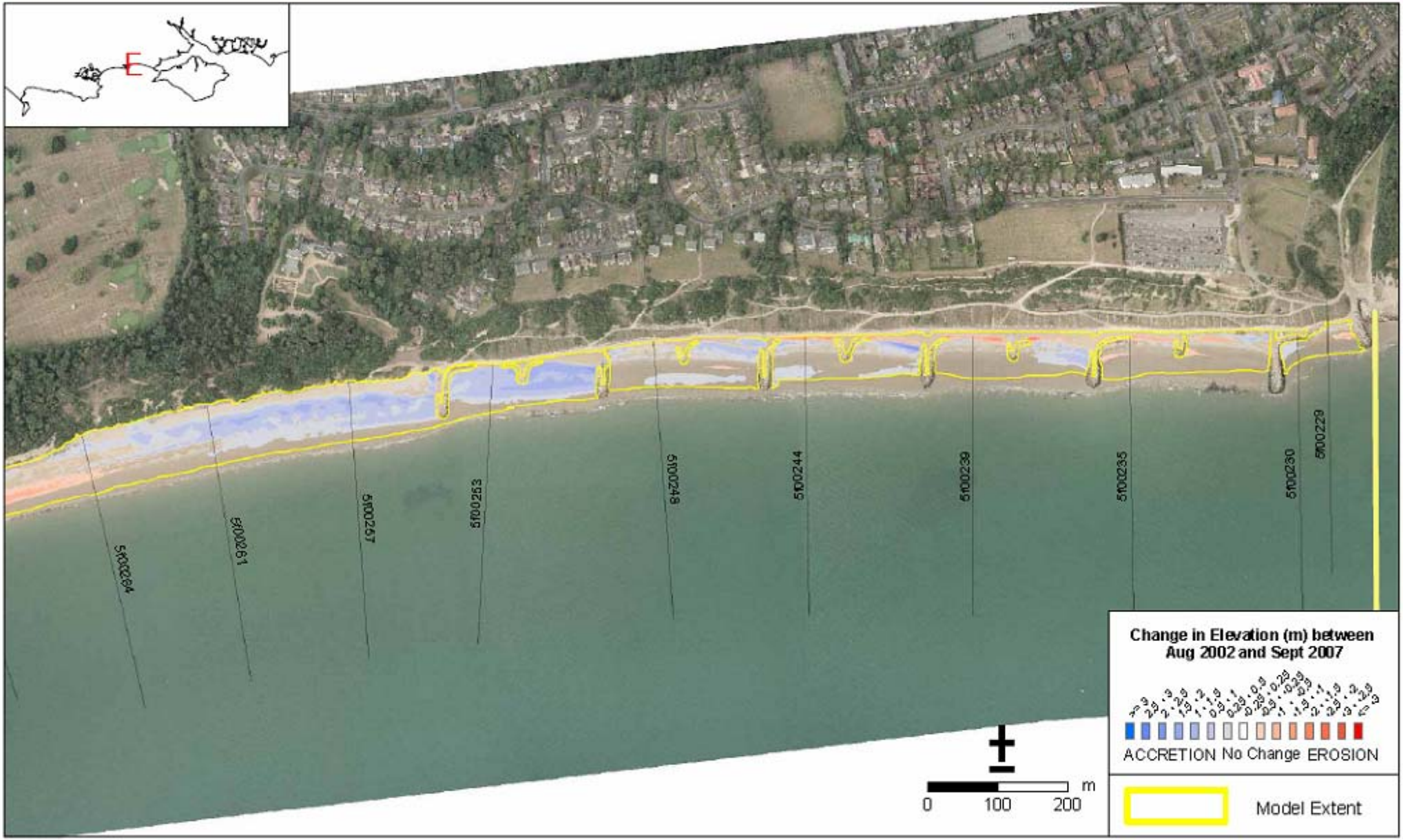


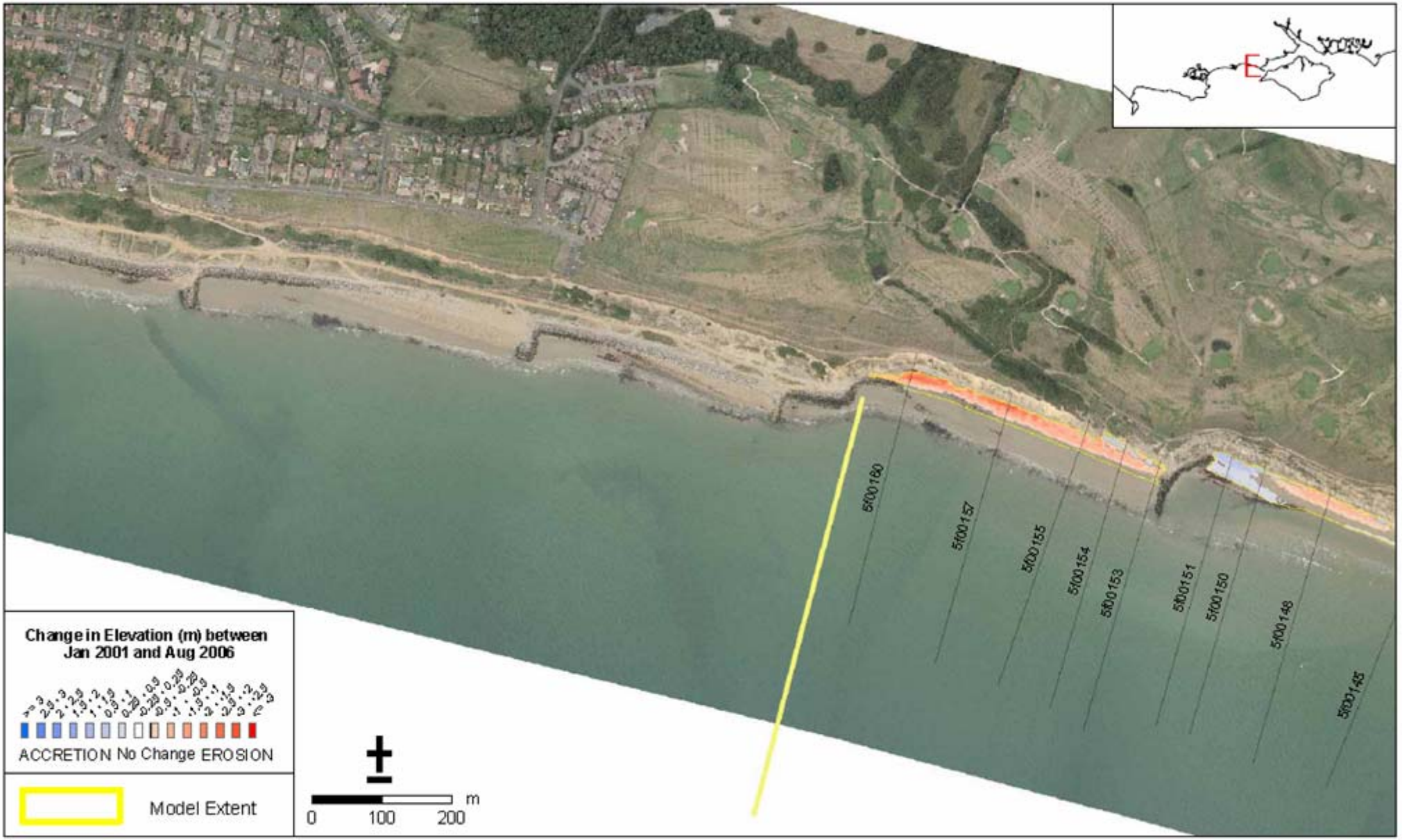


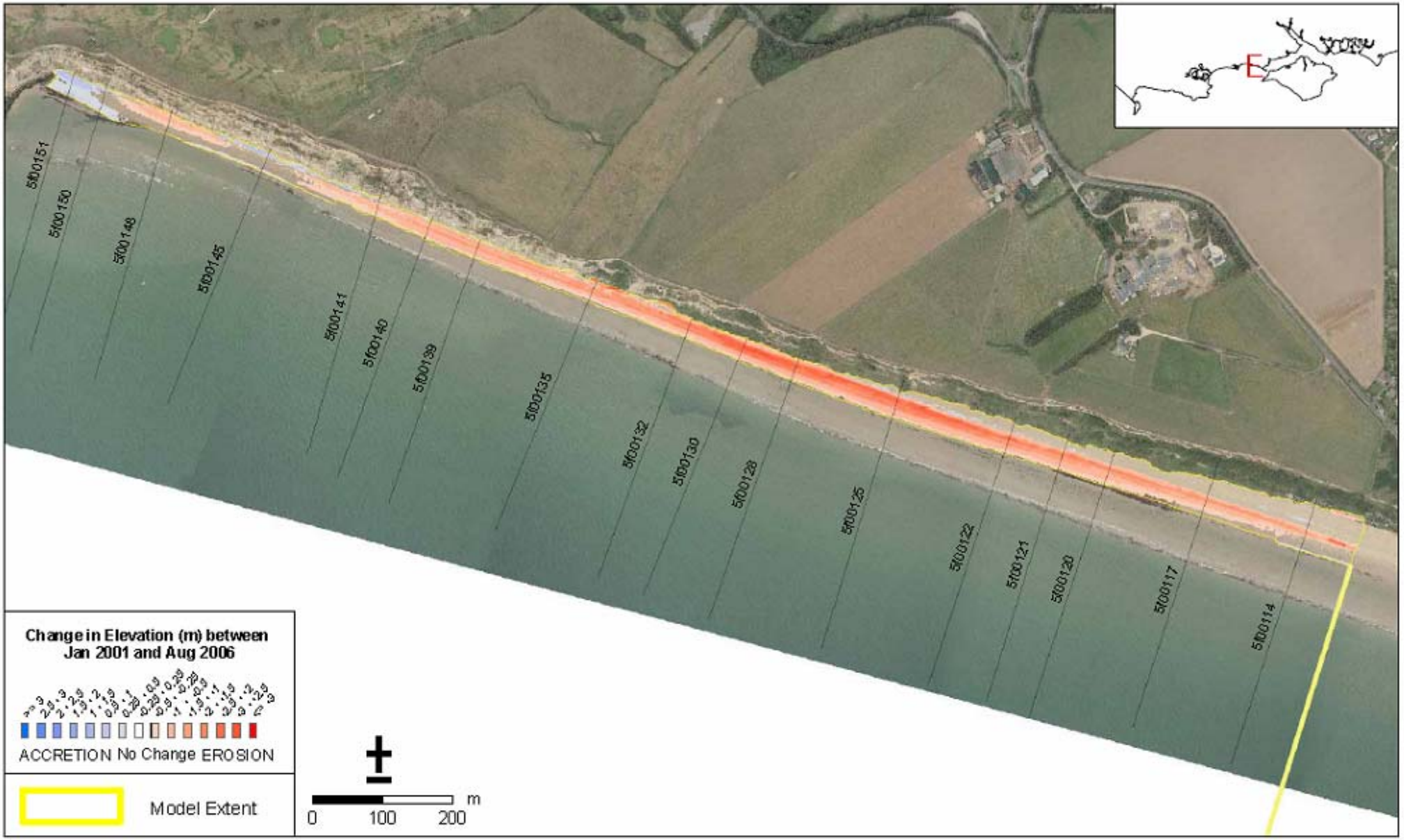

PBY3 - Topographic Difference Model (2002 - 2007) SCOPAC - Poole Bay

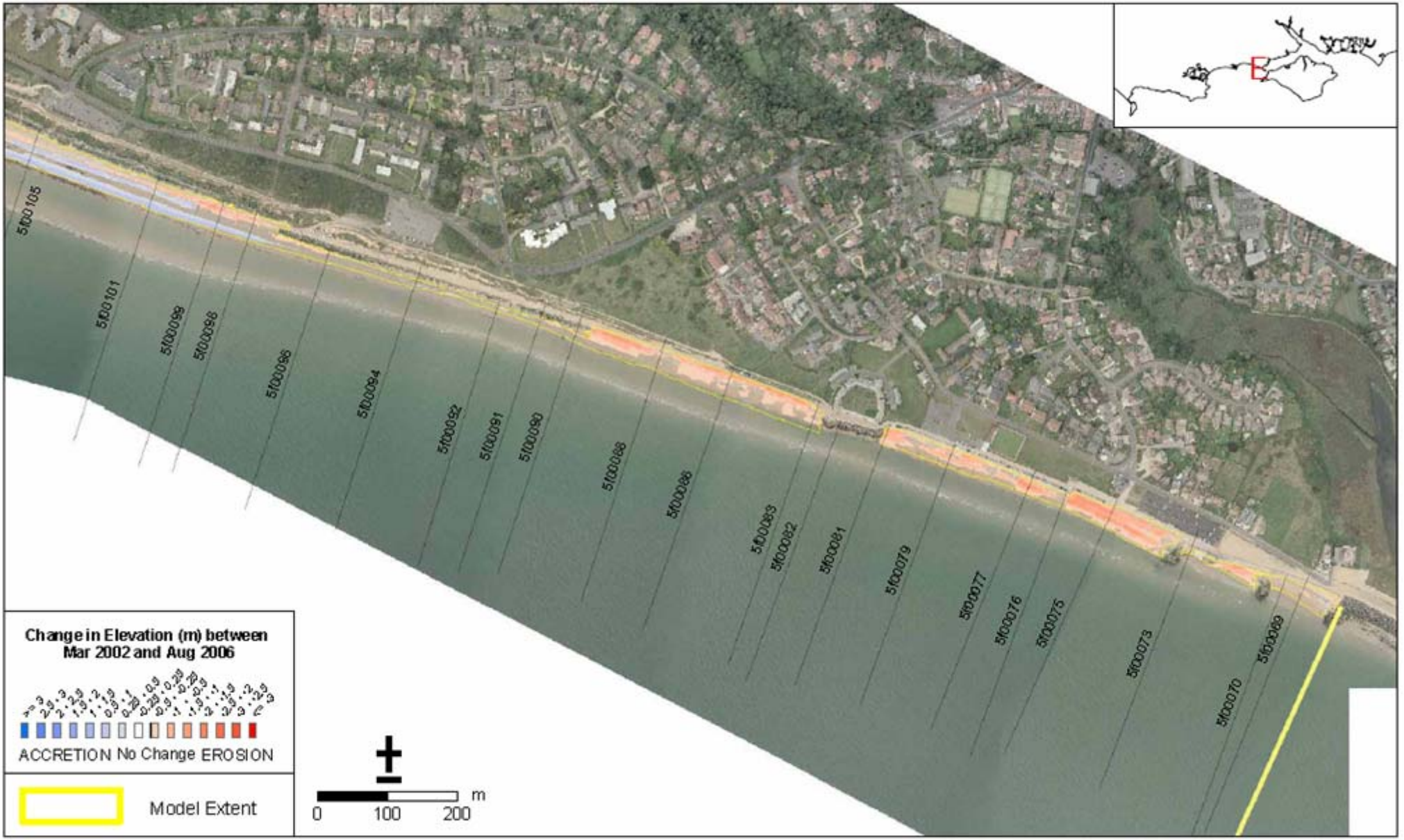

Extraction Site 2008
Extraction Site 2005
Extraction Site 2004
Extraction from dunes May 2006
Material removed from promenade April 2008
Change in Elevation (m) between Sept 2003 and June 2008
>= 3
2.5 - 3
2 - 2.5
1.5 - 2
1 - 1.5
0.5 - 1
0.25 - 0.5
0 - 0.25
-0.25 - 0
-0.5 - -0.25
-1 - -0.5
-1.5 - -1
-2 - -1.5
-2.5 - -2
-3 - -2.5
<= -3
ACCRETION No Change EROSION
0

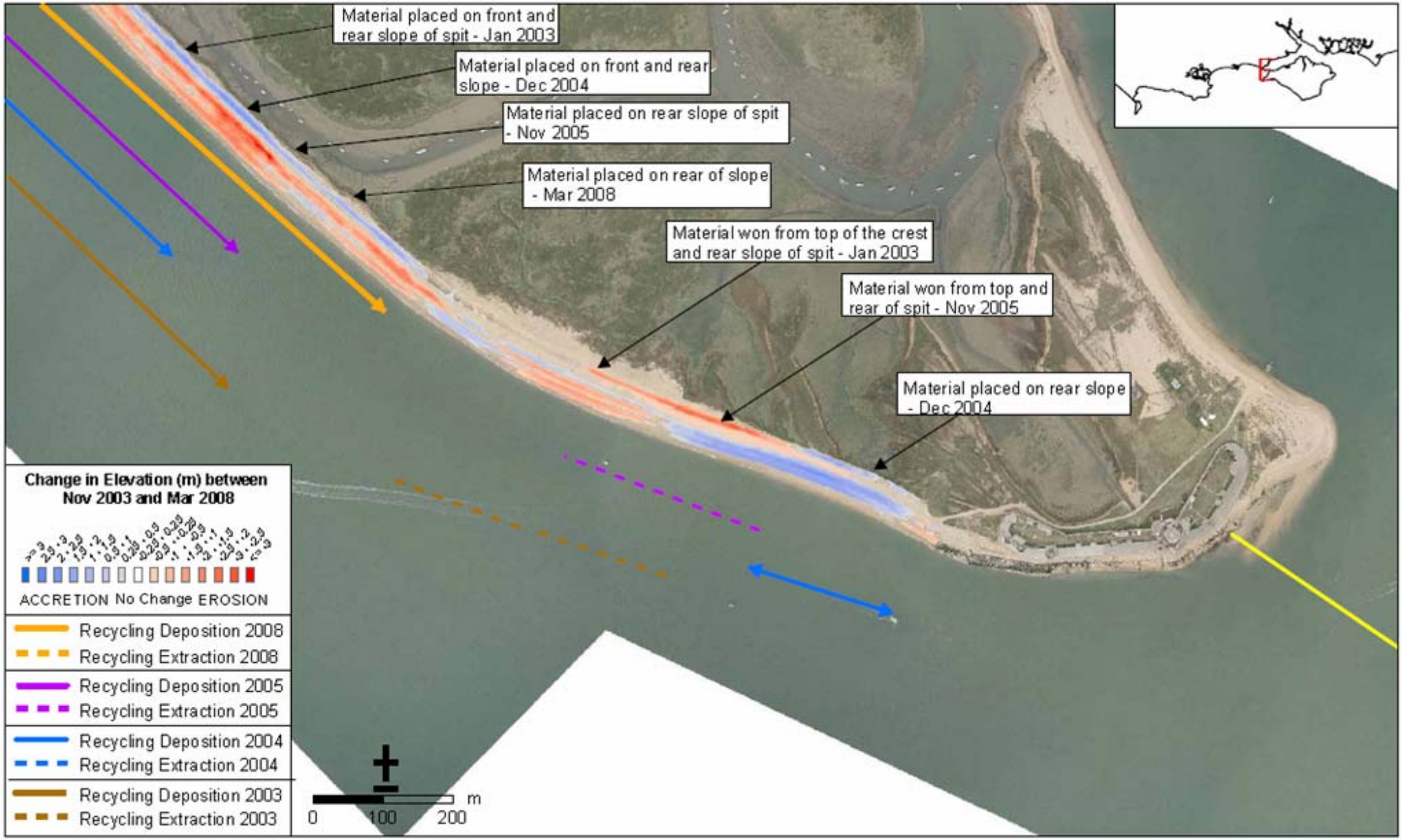

5f00272
5f00276
5f00280
5f00284
5f00288
5f00292
5f00296
5f00300
Change in Elevation (m) between Aug 2002 and Sept 2007
>= 3
2.5 : 3
2 : 2.5
1.5 : 2
1 : 1.5
0.5 : 1
0.25 : 0.5
-0.25 : 0.25
-0.5 : -0.25
-1 : -0.5
-1.5 : -1
-2 : -1.5
-2.5 : -2
<= -2.5
ACCRETION No Change EROSION
Model Extent
0
100
200
m




E
5f00160
5f00157
5f00155
5f00154
5f00153
5f00151
5f00150
5f00148
5f00145
Change in Elevation (m) between Jan 2001 and Aug 2006
>= 3
2.5 - 3
2 - 2.5
1.5 - 2
1 - 1.5
0.5 - 1
0.25 - 0.5
0 - 0.25
-0.25 - 0
-0.5 - -0.25
-1 - -0.5
-1.5 - -1
-2 - -1.5
-2.5 - -2
-3 - -2.5
< -3
ACCRETION No Change EROSION
Model Extent
0
100
200
m







# Predicting change

- Models
- Field measurements
- Extrapolation of trends
- Risks over the next 100 years

- High level of uncertainty
  - Good quality data
  - Long term data

- What if there are no flood defences?
- When?
- Where?
- How often?
- What if sea levels rise?
- What if it becomes more stormy?

# Flooding

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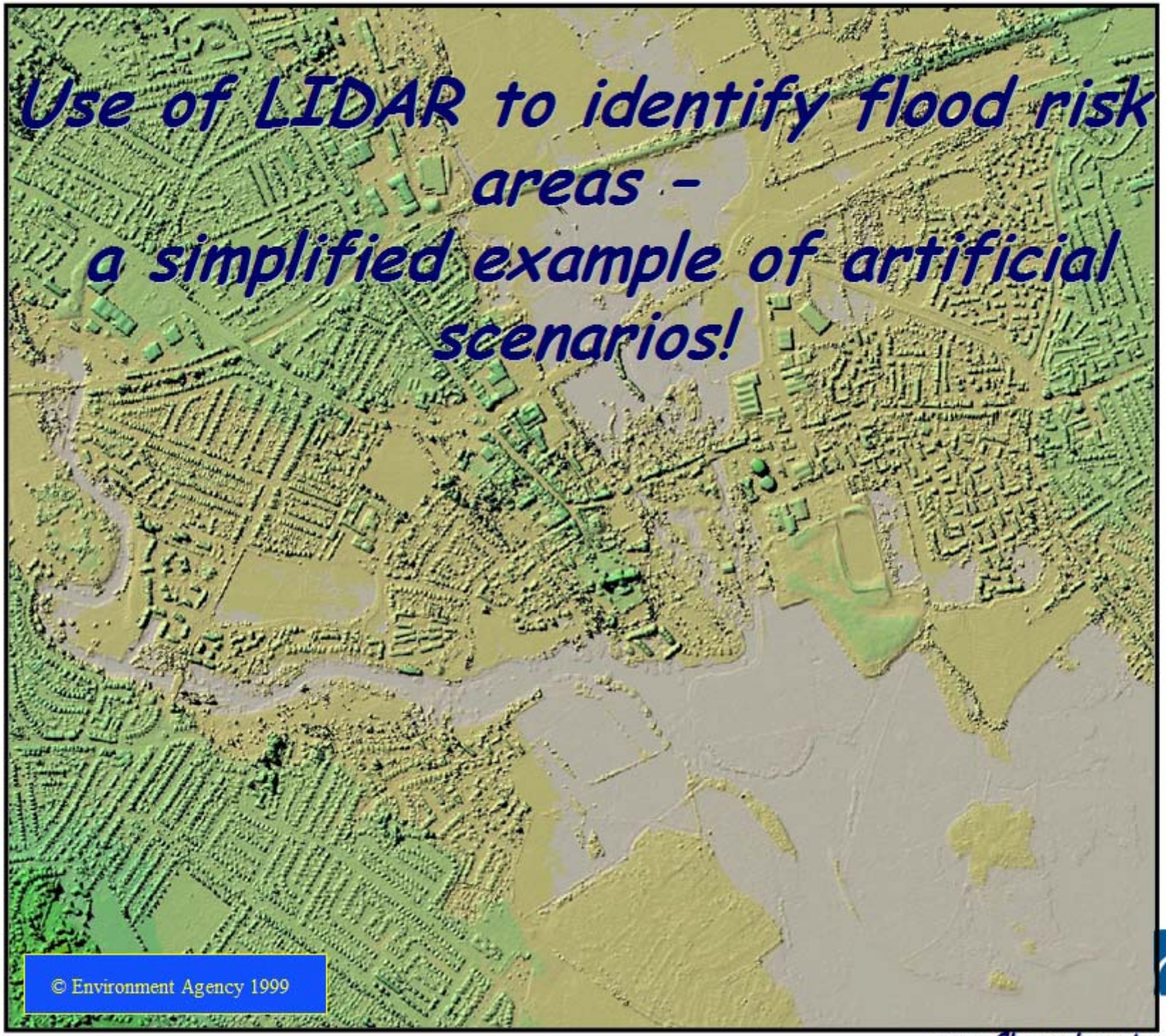
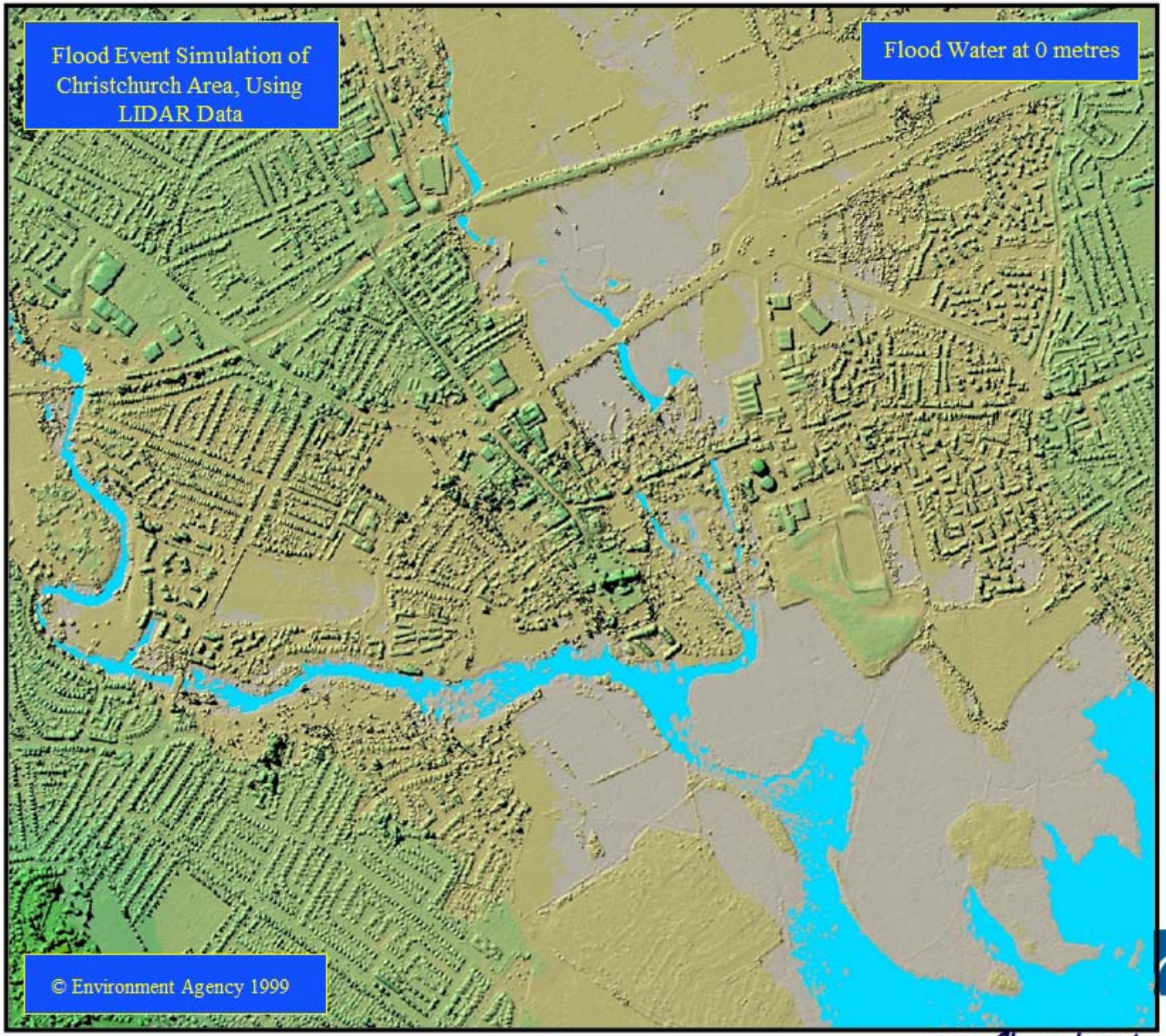
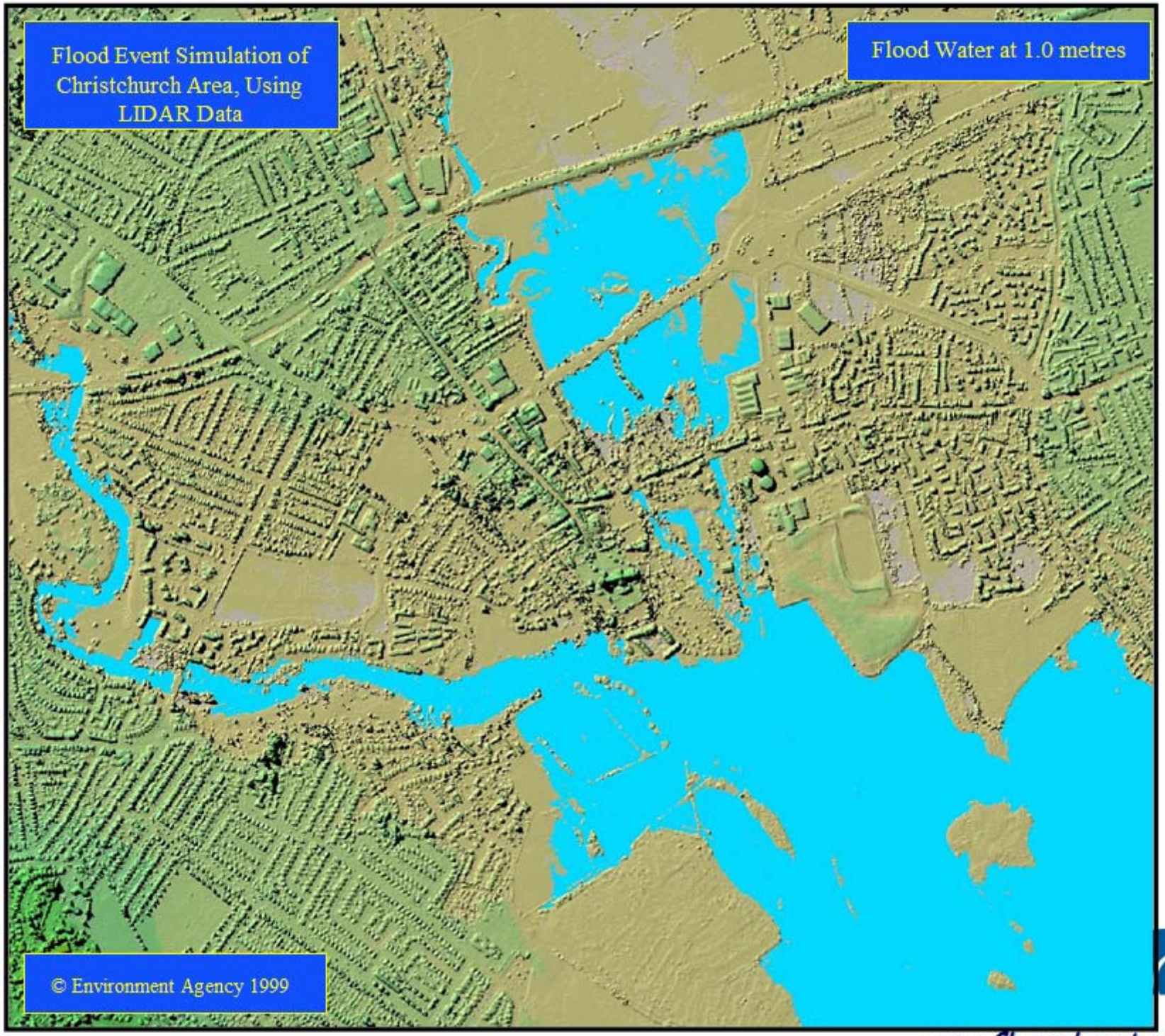
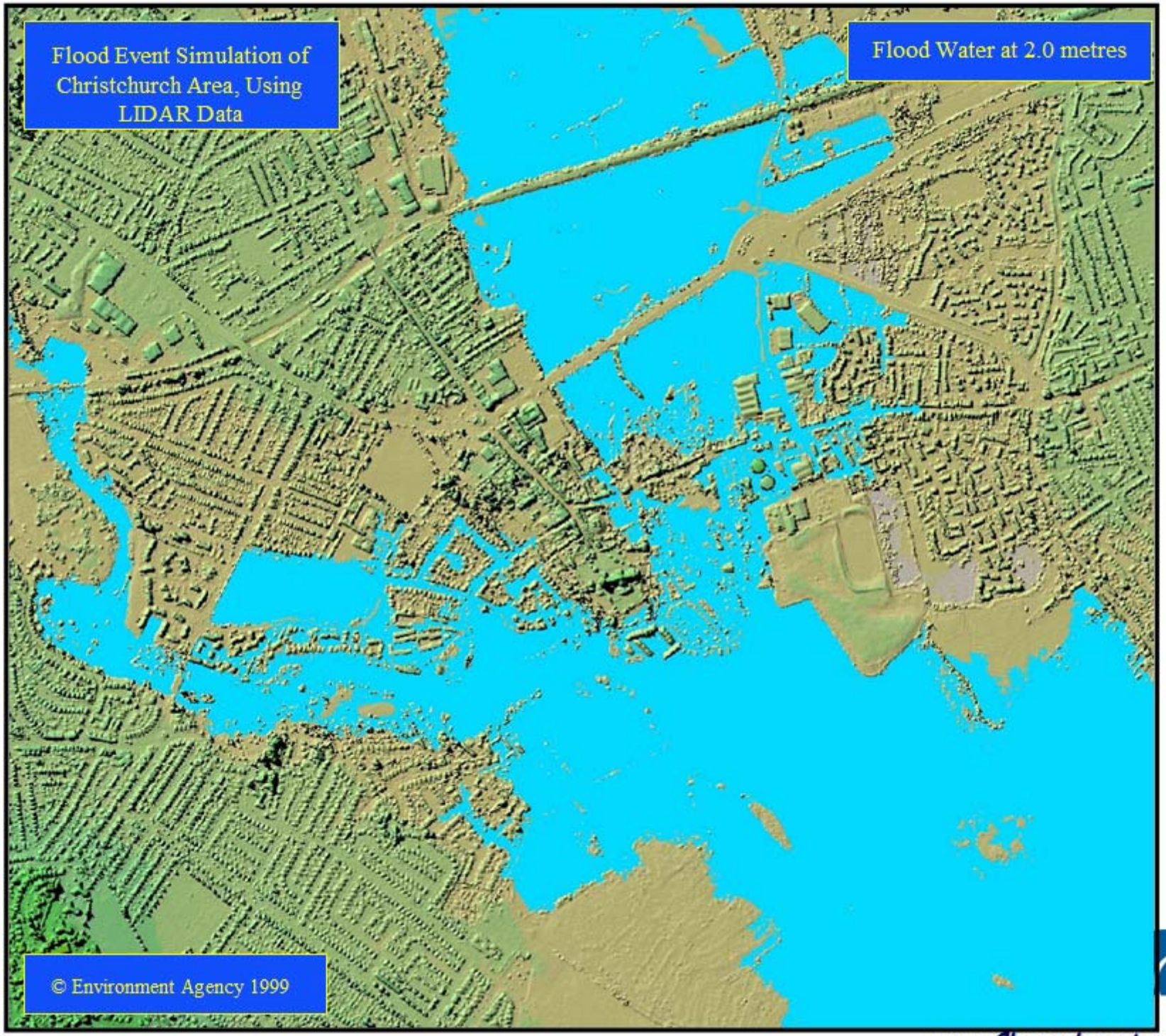
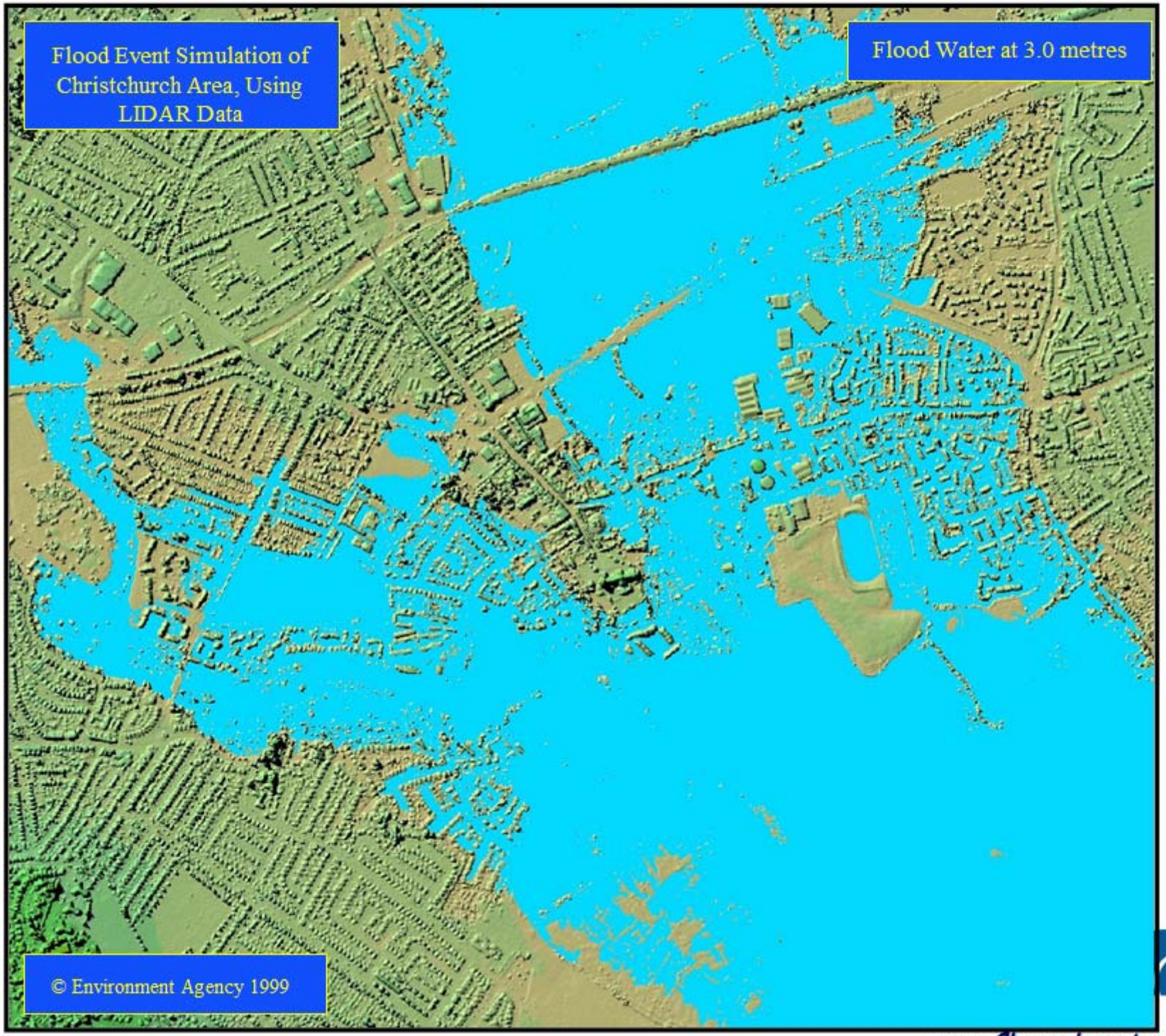

Use of LIDAR to identify flood risk areas -
a simplified example of artificial scenarios!
© Environment Agency 1999









Data provided courtesy of the Environment Agency, Hampshire and West Sussex County Councils

Properties in Tidal Floodplain
Christchurch District Council
Flood Zone 3 (1:200 yr) 2008
Wards Affected By Tidal Flooding

| Local Authority | Number of Properties in Tidal Floodplain |
|---|---|
| Christchurch District Council | 545 |

0 0.5 1 2 3 km

N

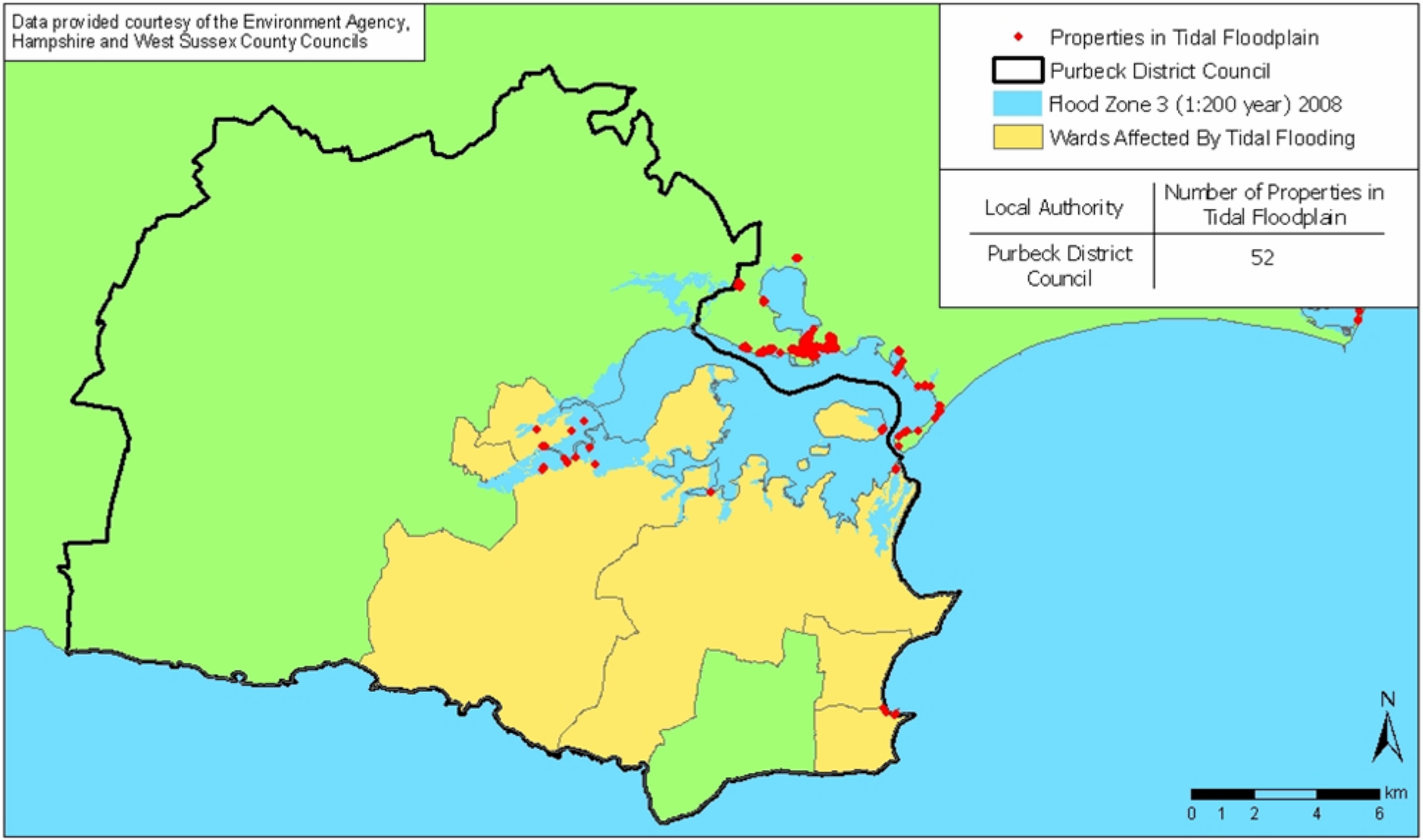
Data provided courtesy of the Environment Agency, Hampshire and West Sussex County Councils

Properties in Tidal Floodplain
Poole Borough Council
Flood Zone 3 (1:200 year) 2008
Wards Affected By Tidal Flooding

| Local Authority | Number of Properties in Tidal Floodplain |
|---|---|
| Poole Borough Council | 1004 |

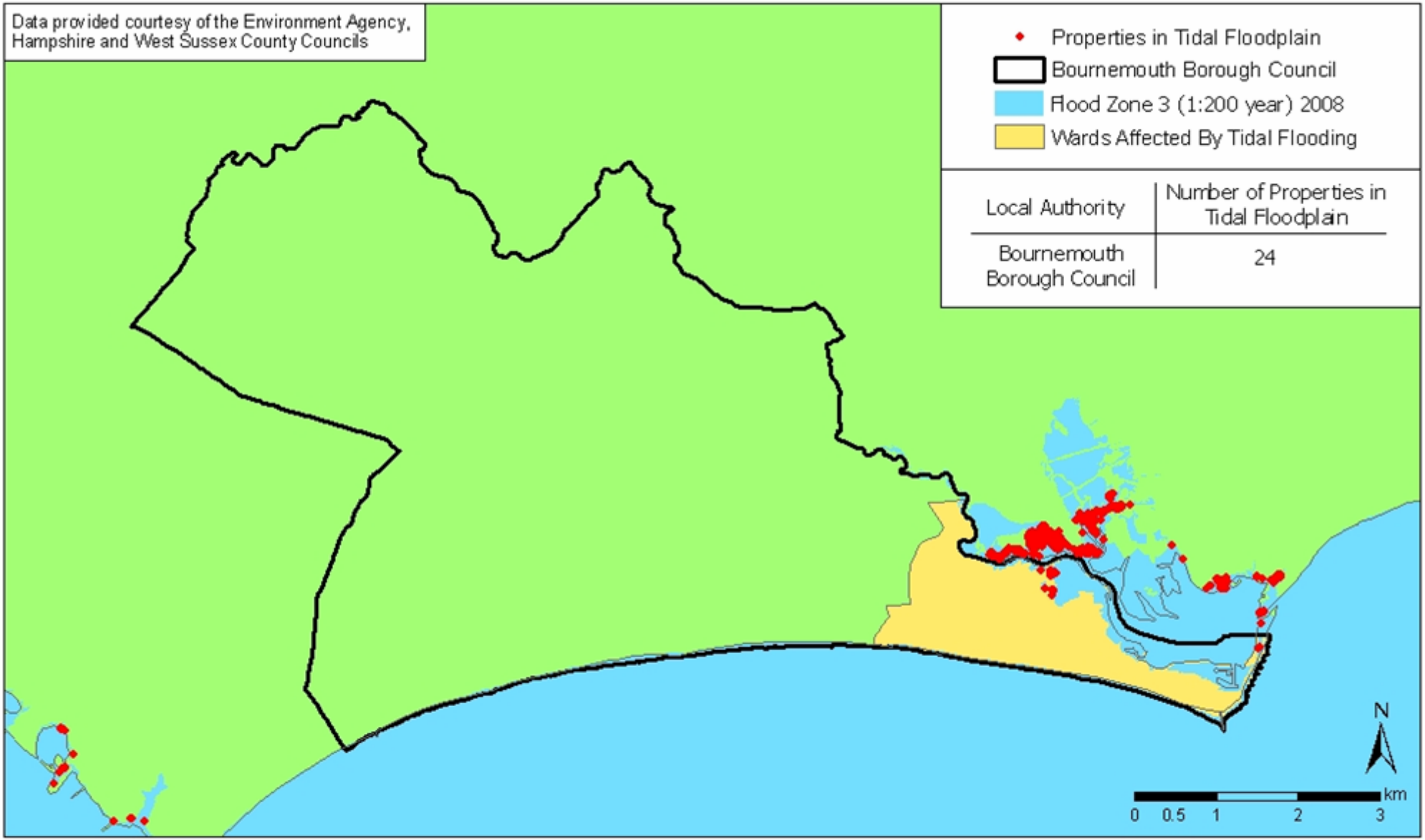
N

0 0.5 1 2 3 km



Two Bays Shoreline Management Plan

No Defences Present




Bournemouth Borough Council

Flood Zone 3 (1:200 yr) 2008