Change of land use in Modern Yellow River Delta

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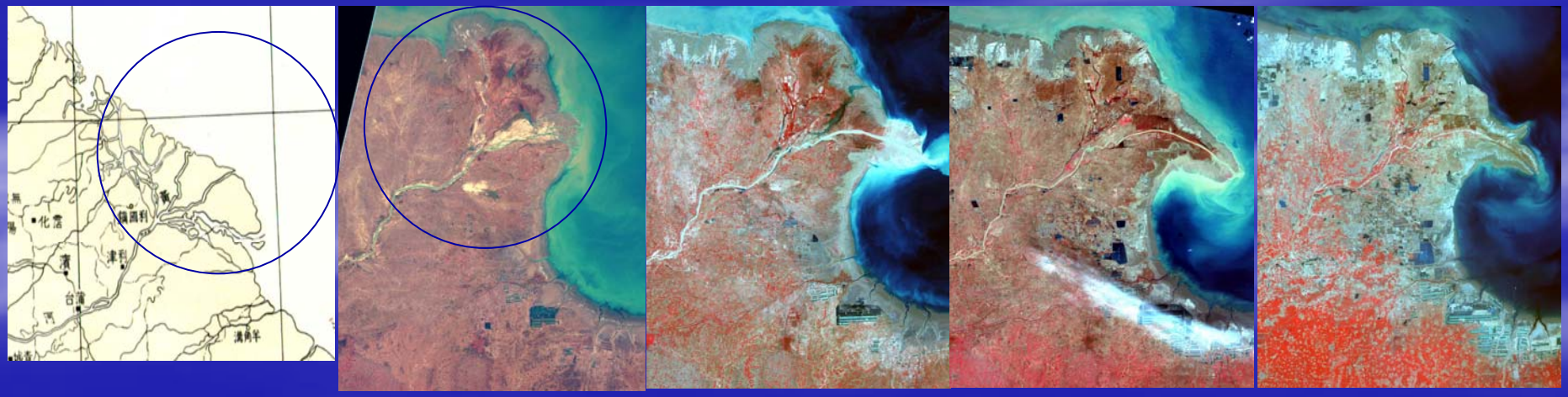
The Objective

The Yellow River Delta is richly endowed with oil, gas, bittern and other natural resources. And its geographic location advantage in the Bohai Economic Region add to its potential. So the project-Development and conservation in the Yellow River Delta-is one of priority programme for China'agenda and key project of Shandong Province.

The objective of the project is to improve understanding of regionally based, interactive change between land-use and covers.

1940s 1976 1980s 1995 2002



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Land use type maps in 1956, 1984, 1991 and 1996 (after Ye Qinghua, 2002)

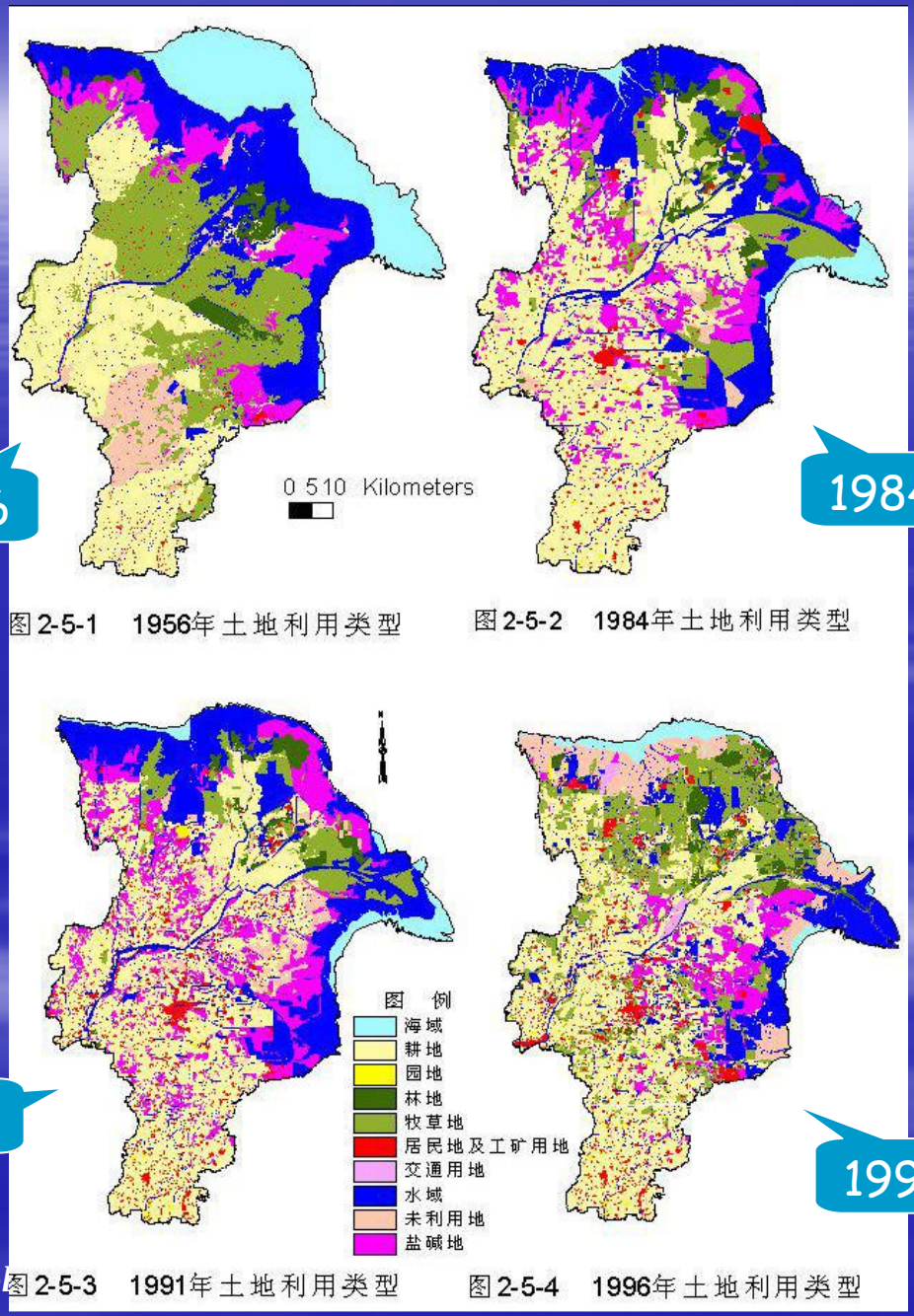

图2-5-1 1956年土地利用类型 图2-5-2 1984年土地利用类型

图2-5-3 1991年土地利用类型 图2-5-4 1996年土地利用类型

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Materials and Methods

- Landsat Images in 1987 and 2001
- 1:5000 topographic maps in study area
- GIS
- The dynamic indicator (Zhu et al., 2001)
- Compositive land use dynamics indicator
- Land-use composite index (Zhu et al., 2001)

$$La=100\times\sum Ai\times Ci$$

$$La\in[100,400]$$

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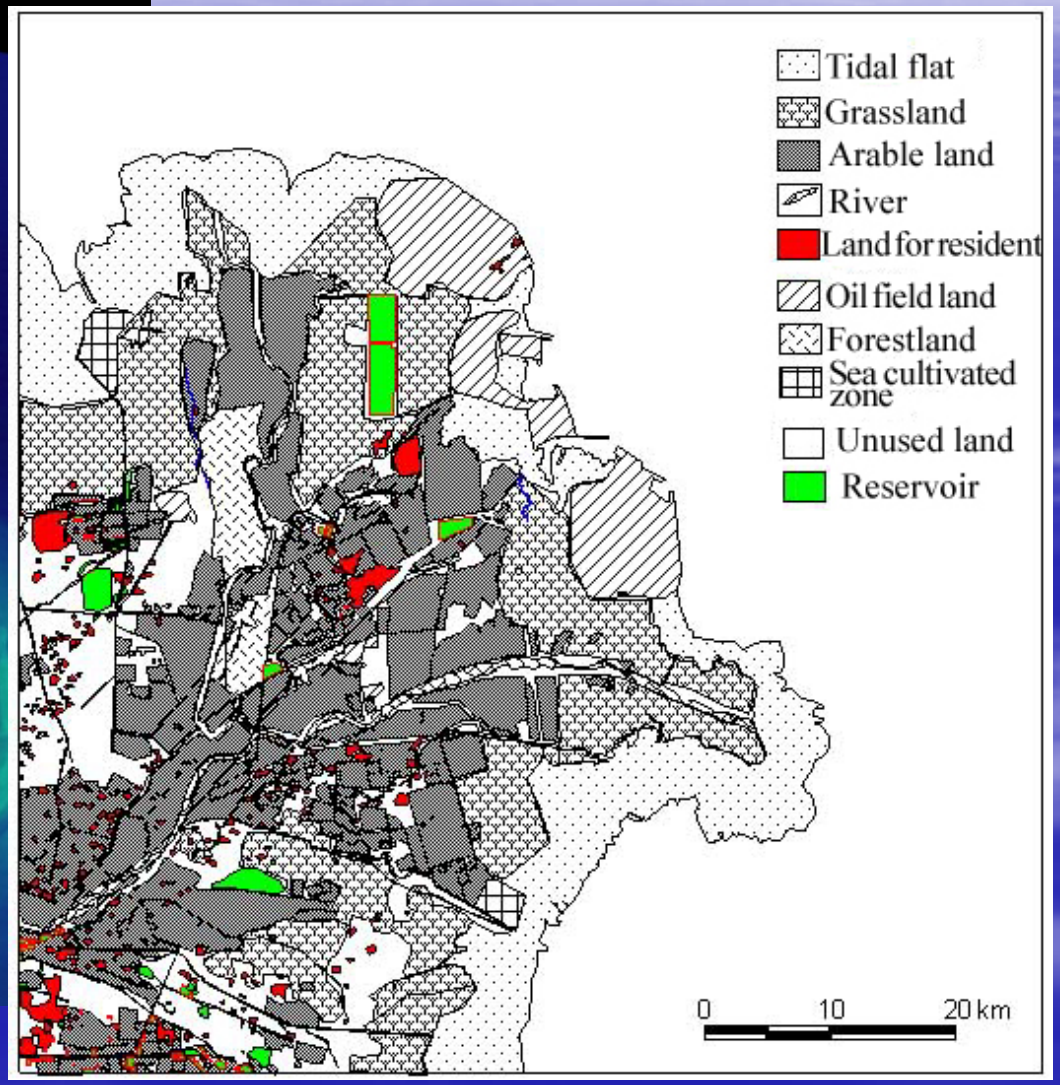
False composite image of ETM+ of 1987(RGB531)
And Land use/cover map



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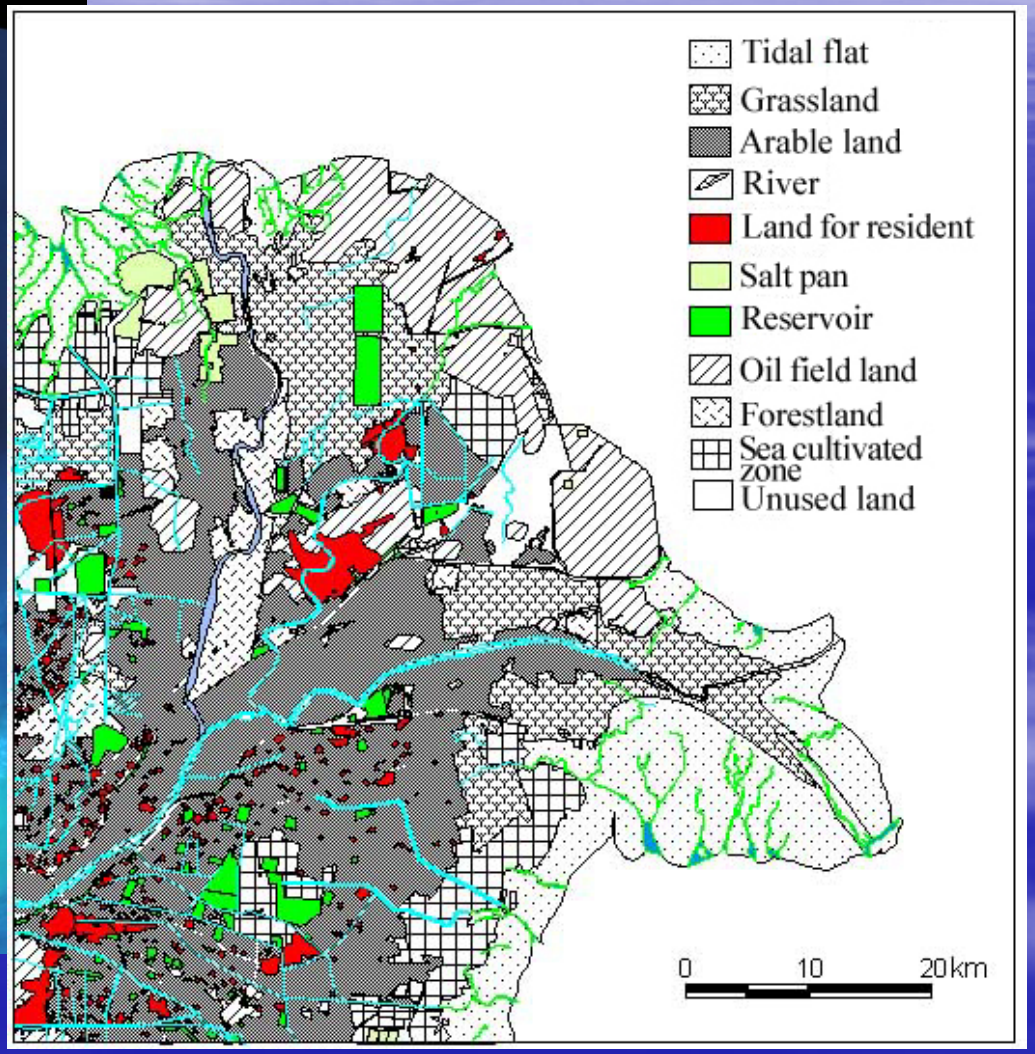
False composite image of ETM+ of 2001(RGB531)
And Land use/cover map



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Land use/cover change of each type

1987 to 2001

TYPE	change (ha)	TYPE	change (ha)
arable	27146	Resident area	5956
forestland	6419	Oil field land	23735
grassland	-24005	Tidal flat	-6033
reservoir	6707	Sea cultivated zone	24525
river	1127	Unused land	-45864

Increase of Yellow River Delta 26838 ha

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Spatial changes of land use and cover

1987 to 2001

a. Change of Arable land (ha)

->Forest 4506
->Grass 8059
->Reservoir 3043
->resident 3884
->Oil field land 4859
->Sea cultivated 179

b. Change of grass land (ha)

-> Arable land 13261
-> Forest 1905
-> Reservoir 1345
-> resident 1204
-> Oil field land 7646
-> Sea cultivated 9837

C. Change of Tidal flat (ha)

-> Grass 4637
-> Oil field land 6339
-> Sea cultivated 12295

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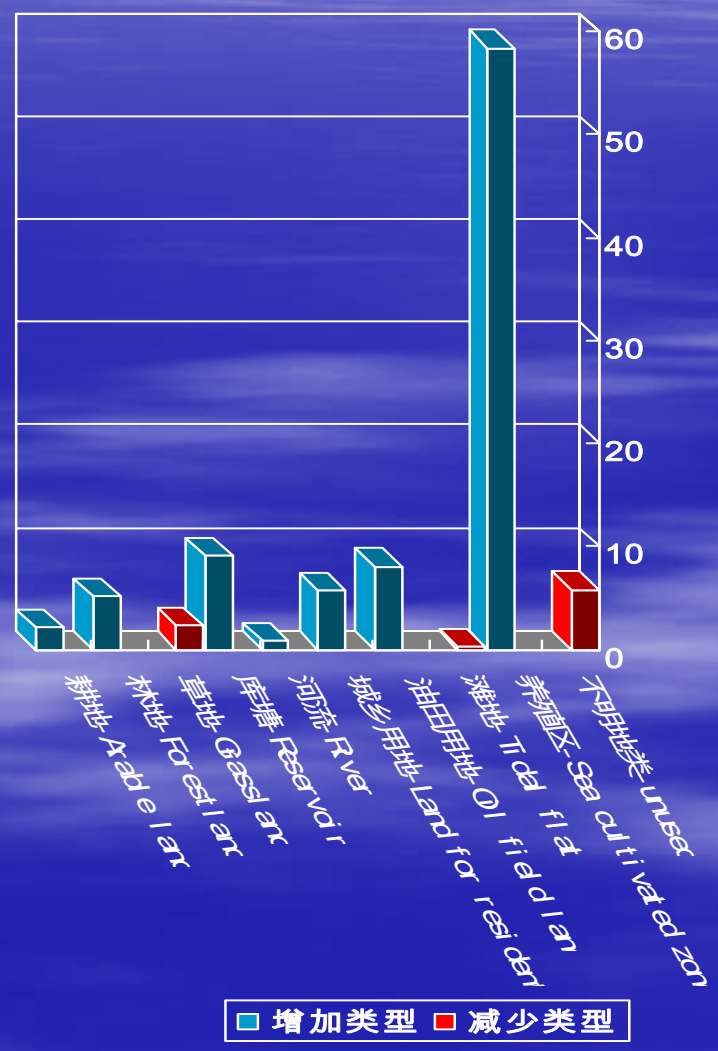
Dynamic indicator of each land use type

1987 to 2001

TYPES	indicator %
Arable land	2.13
Forestland	5.09
Grassland	-2.27
Reservoir	9.03
River	0.78
Land for resident	5.71
Oil field land	8.07
Tidal flat	-0.42
Sea cultivated zone	58.39
Unused land	-5.78



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Compositive land-use dynamics indicator

1987 to 2001

In study area 1987-2001
1.82%

In area around Bohai Bay
0.85% (Zhu et al. , 2001)

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Land-use composite index

1987 to 2001

- 210 in 1987
- 247 in 2001
- Bigger than that of whole China

  (whole country average 202 ; extensively developed area 275)

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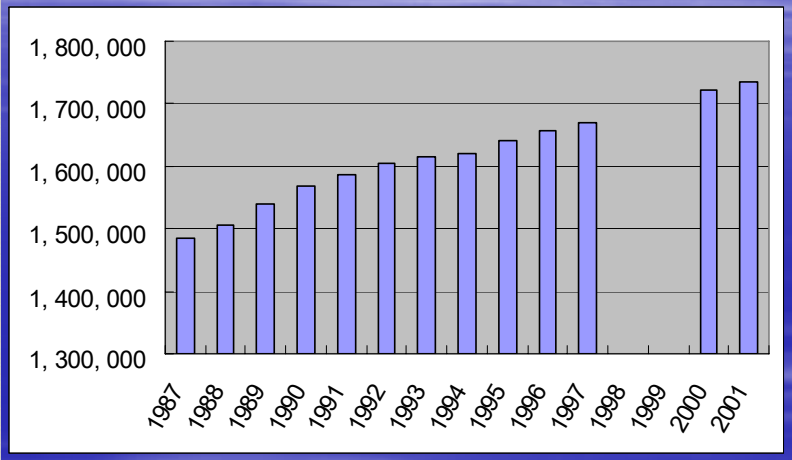
Drivers of land use change



Population of Yellow River Delta from 1987 to 2001

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Conclusion

- 1. Land use change faster in Yellow River Delta than neighbor zone (around Bohai Bay), and the degree of land use in the Modern Yellow river delta is bigger than the average of the whole country.
- 2. On the quantity change, grassland, tidal flat and unused land decreased. Other kind of land use increased, especially the kinds that were exploited by anthropogenic activities.
- 3. Spatial analysis shows that the basic transition mode is that grassland change to arable land and then the other kind of land use type. At various spatial and temporal scale, the drivers of land-use change is different. The main drivers here include macro-economic factor, demographic factor and agroclimatic potential.
- 4. The changes of land use and cover make ecological risks in the delta. So measure should be taken to monitoring the change of environment and the negative effects should be avoid.

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Thank you for your attention.

Birds and wetlands in Yellow River Delta

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