Sedimentation processes in the Mekong River Delta, Vietnam

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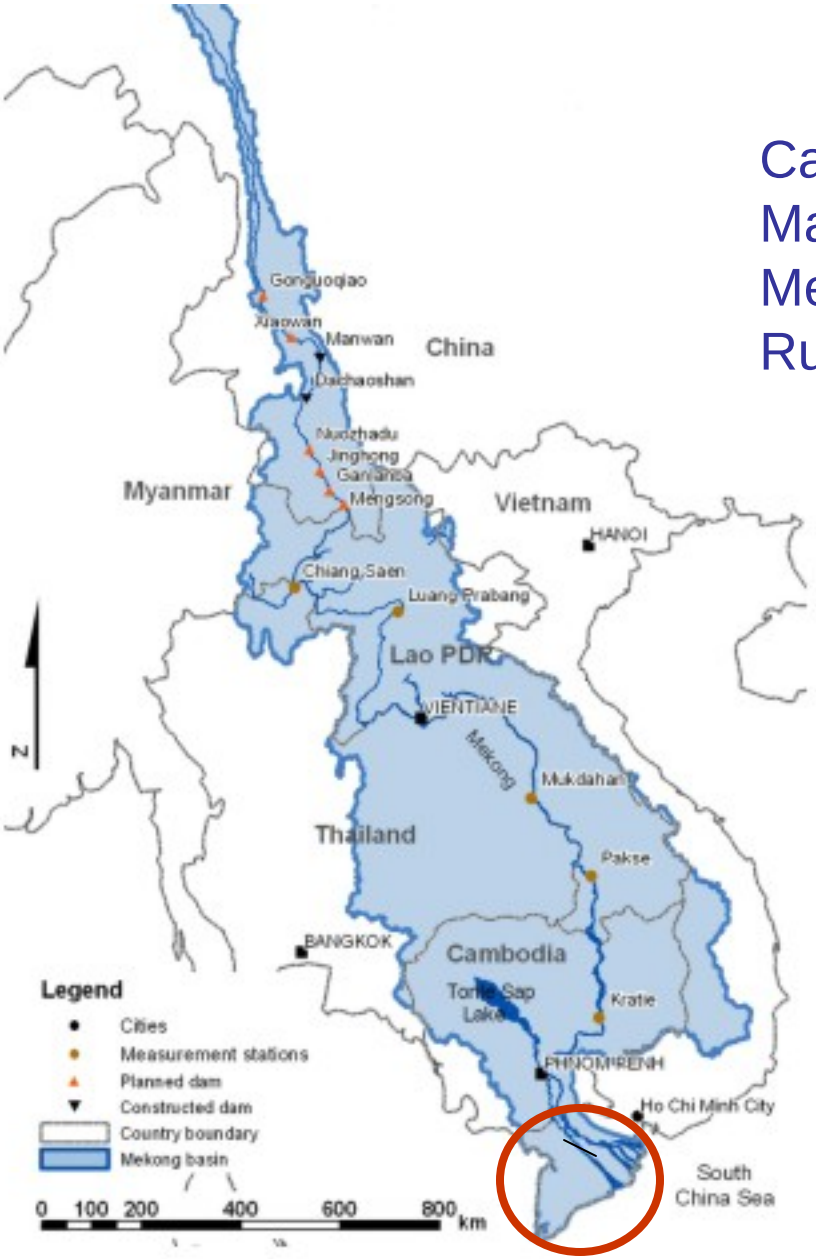
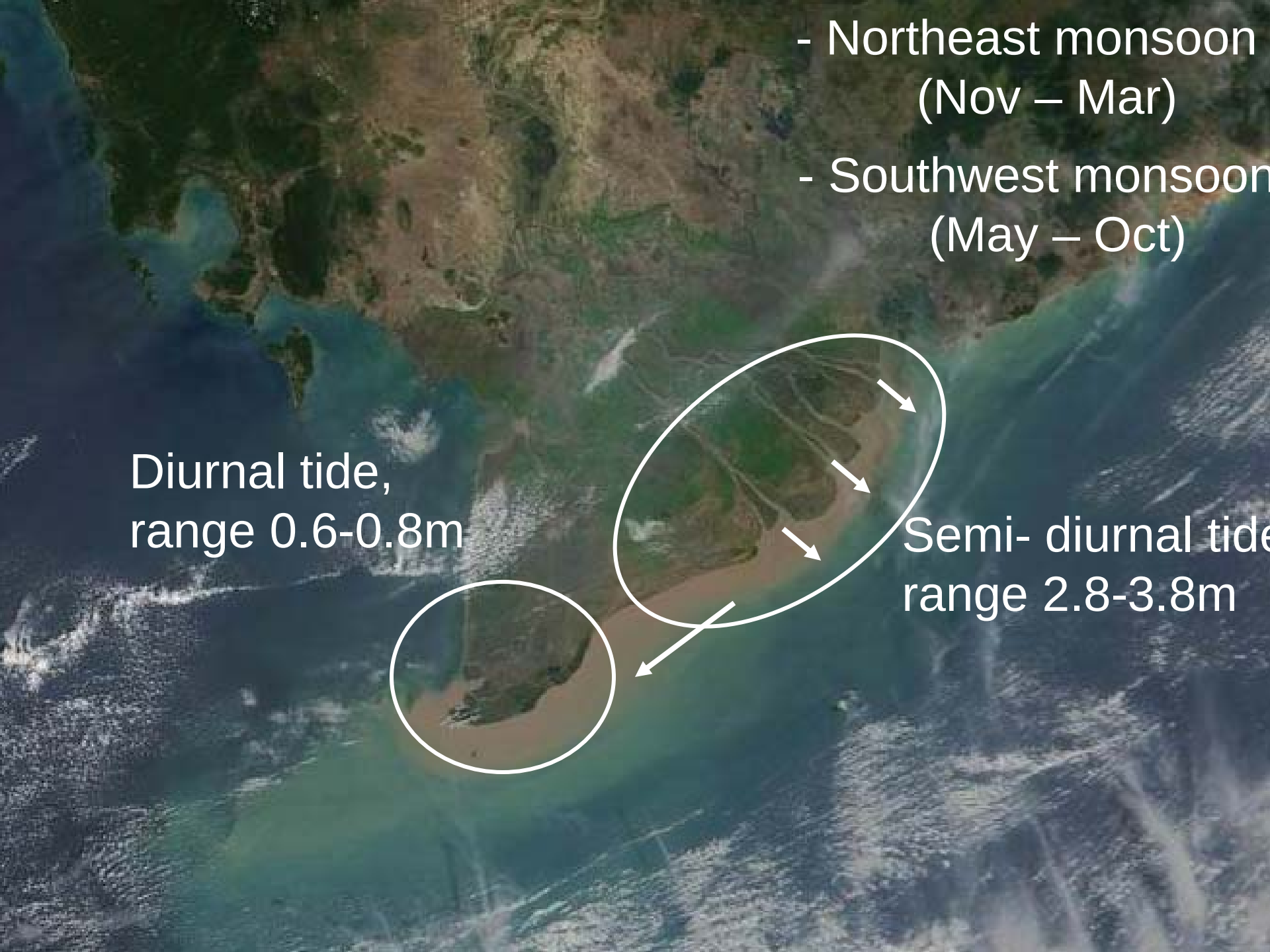
- **Morpho- sedimentology of the Mekong River Delta**
- **Sedimentation process in the coastal areas of active delta plain, Ben Tre and Tra Vinh provinces**
- **Sedimentation process in the coastal areas of delta margin, Ca Mau area**

- **Morpho- sedimentology of the Mekong River Delta**



Catchment area: 795,000 km^2
Main stream length: 4,800 km
Mean flow: 14,500 m^3/s
Run off: 575 mm

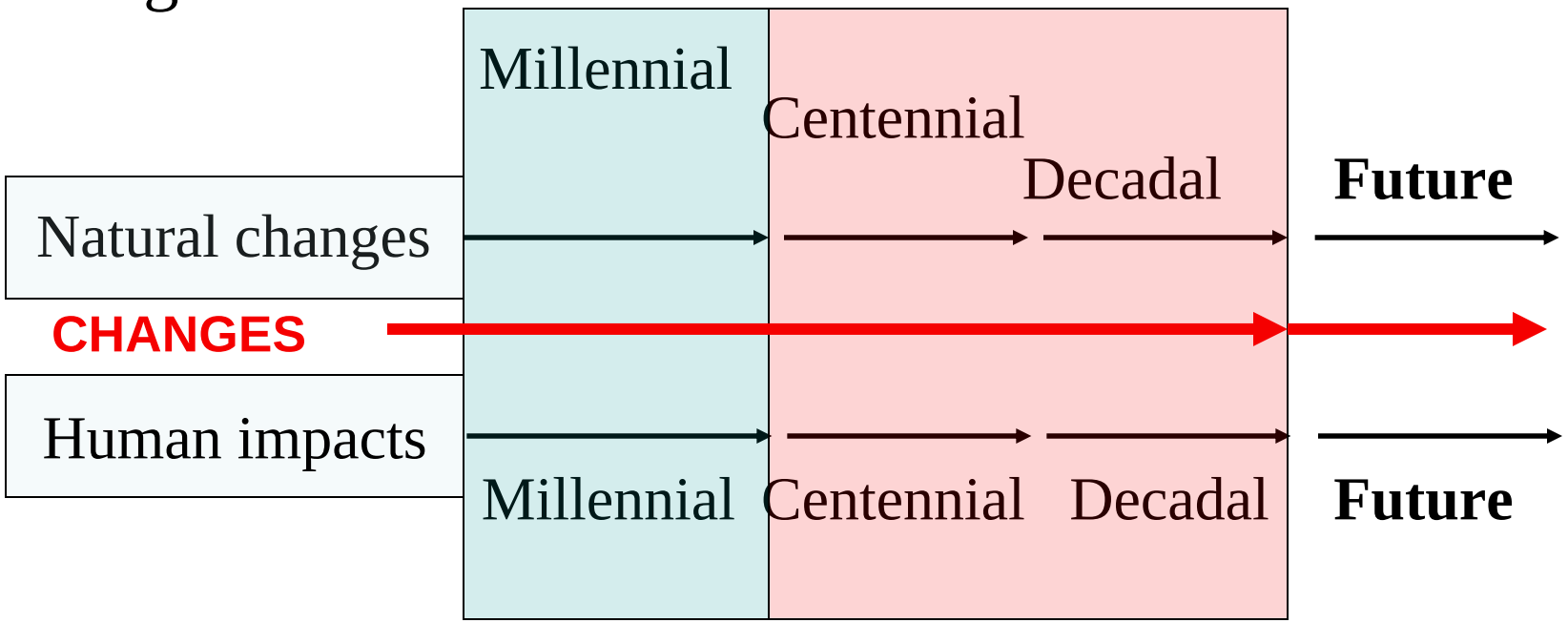
Delta area: 62,520 km2
Mean tidal range: 2.5 m
Mean wave height: 0.9 m
Water discharge: 470 km3/y
Sediment discharge: 160 million ton/y


- Northeast monsoon
(Nov – Mar)
- Southwest monsoon
(May – Oct)
Diurnal tide,
range 0.6-0.8m
Semi- diurnal tide
range 2.8-3.8m

Environmental changes and geological assessment in the coastal zone of Mekong River Delta

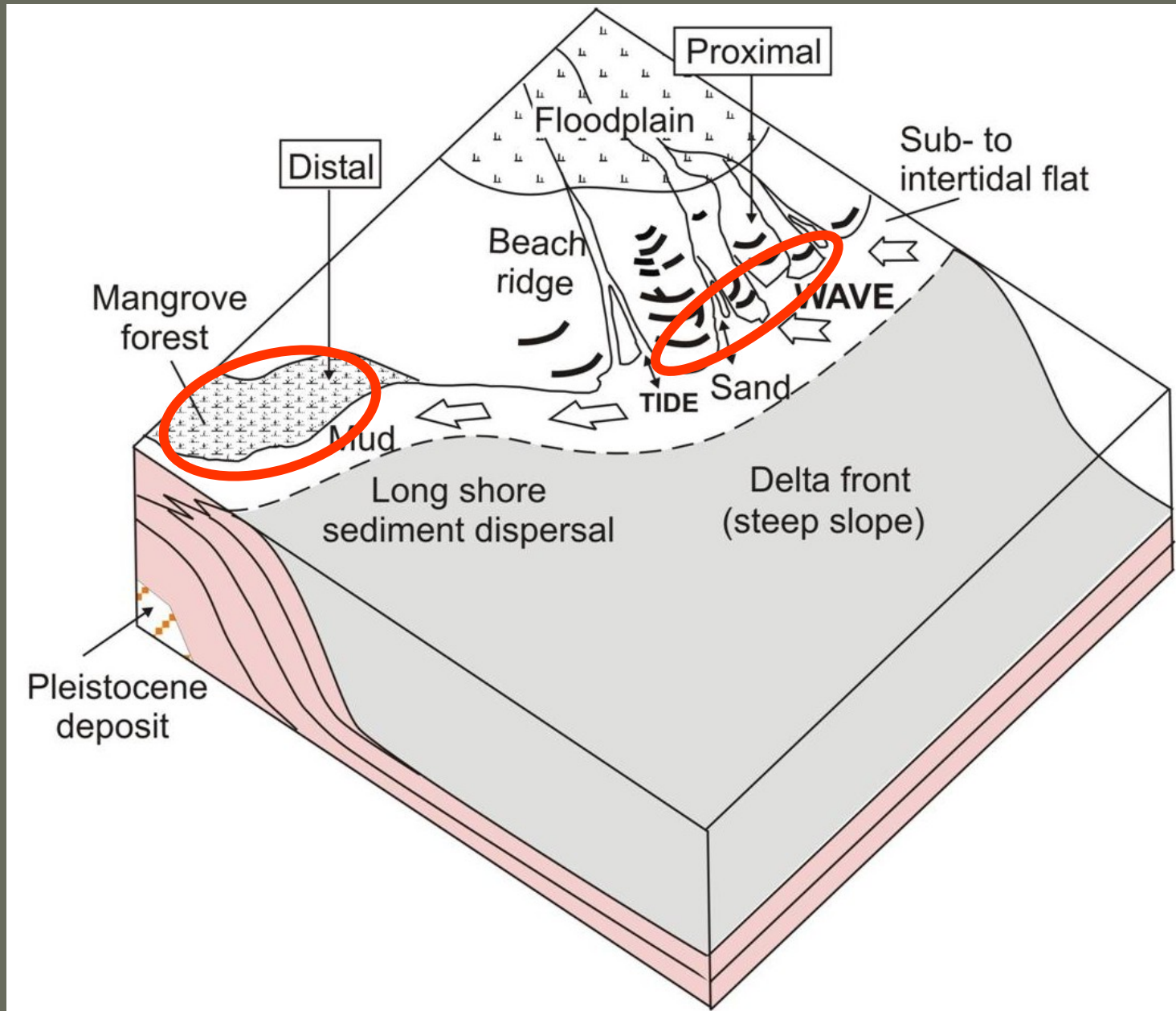
Annual to decadal environmental change and current sedimentary process

1) morphological change analysis of the coastal zone
2) sedimentological analysis of the coastal zone
3) satellite imagery analyses for land use & coastal zone changes.



Tide-wave dominated

tide dominated



Coastal environments

a/ Tide – wave dominated coast
(Ben Tre, Tra Vinh areas)

- sand dune and beach ridge
- coastal plain
- mangrove swamp
- tidal flat

b/ Tide dominated coast (Ca Mau area)

- mangrove swamp
- tidal flat

- **Sedimentation process in the coastal areas of active delta plain, Ben Tre and Tra Vinh provinces**

Deposition and erosion area at BenTre coast (ha)

Period	Erosion area	Deposition area	Total area	Average
1972 - 1987	-524	+2,913	+2,389	159
1987- 1996	-670	+1,281	+611	68
1996 - 2004	-367	+1,203	+836	104
1972 - 2004	**-1,561**	**+5,397**	**+3,336**	**105**

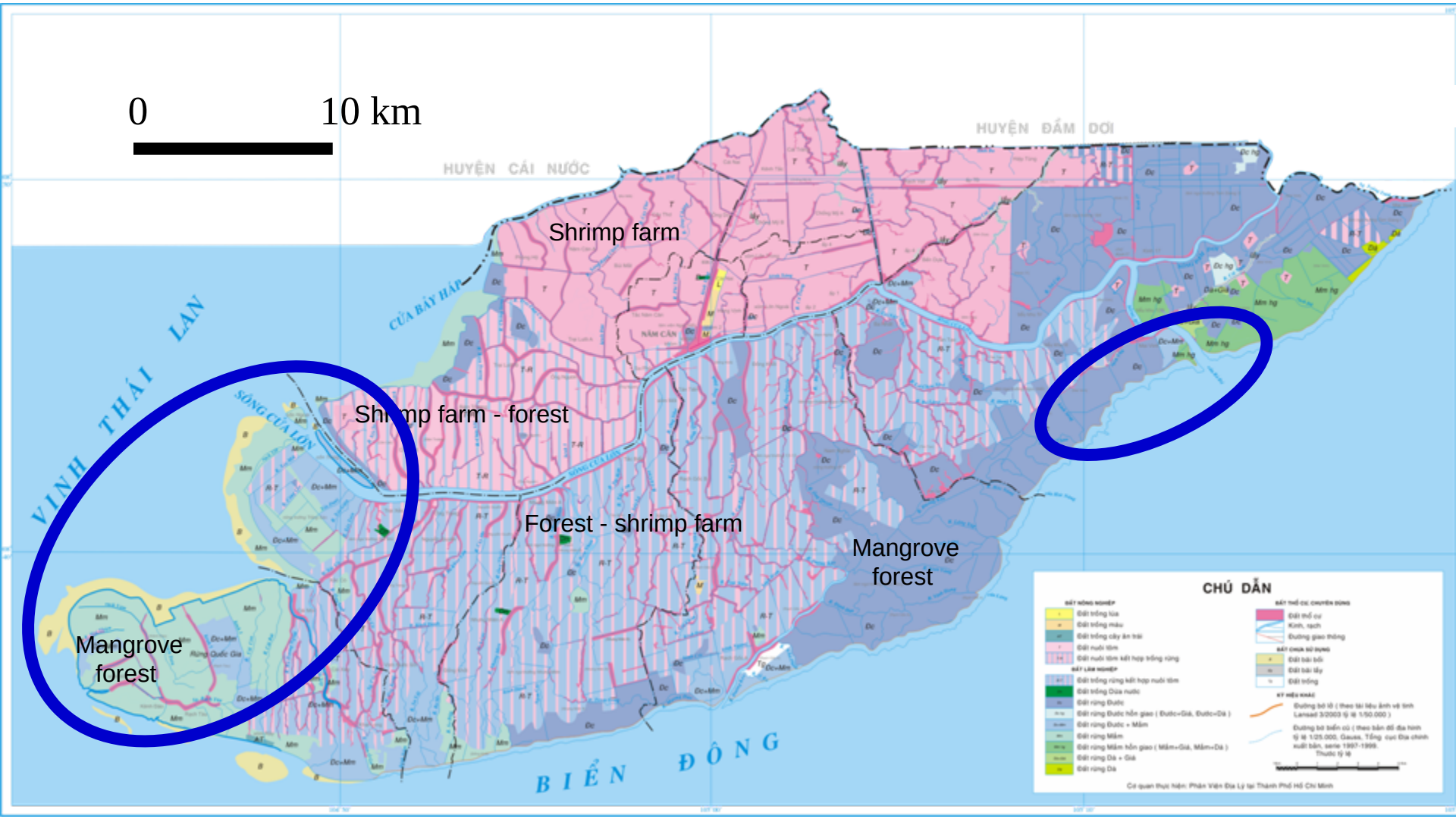
Period	Progradation rate (m/y)	Erosive rate (m/y)
3000-present	10 - 20	
1966- 2003	**6- 7, 30- 32**	**8- 15**


erosive coast


Depositional coast

- **Sedimentation process in the Ca Mau coastal areas, delta plain margin**

Land use map in Ca Mau cap in 2003



Deposition and erosion area at Ca Mau coast (ha)

Period	Erosion area (eastern)	Deposition area (western)	Total area	Aver-age
1885 - 1940	-6,494	+5,875	-619	-11.2
1940 - 1965	-2,344	+3,181	+837	+33.5
1965 - 1985	-2,427	+3,189	+762	+38.0
1985 - 1998	-1,625	+1,401	-223	-17.0
1885 - 1998	-12,890	+13,646	+756	+6.70

Depositional coast

erosive coast

Conclusion

1) Beach profile is a good indicator showing erosional/depositional status of the coast.

   Beach profile change from depositional to erosional coasts will occur before serious shoreline erosion. It will be very important to mitigate coastal erosion and take its measures.

   To survey all beach profiles for understanding the present status and monitoring of key areas are recommended.

2) Causes of coastal erosion in the MRD:

a) Decrease of sediment supply from Mekong River and sand mining (dredging) in river channels ?

b) Change of NE and SE monsoons: change of depositional and erosive areas. It seems to be serious erosion from 1985- 2004.

3) Future survey needed

a) Seasonal change of beach profiles to clarify influences of NE and SE monsoons

b) Comparing sediment supply from Mekong River (stream, bank erosion, bed erosion) to deposition in the MRD (over bank, channel) and coastal variation (deposition and erosion).

c) Satellite imagery analysis: decadal scale land use and morphology changes due to human impacts,