

RESEARCH THE DISASTER BY REMOTE SENSING AND GIS (CASE STUDY THUA THIEN - HUE PROVINCE, VIETNAM)

Truong Thi Hoa Binh*, Tran Minh Y

Space Technology Institute, Vietnamese Academy of Science & Technology
18 Hoang Quoc Viet - Cau Giay - Hanoi – Vietnam, *Email: udonbeo@yahoo.com

Commission VIII, WG VIII/2

KEY WORDS: Flood, Coastal-Line Change, Remote Sensing Multi-Temporal Data

ABSTRACT:

Vietnam is situated in the tropical region and has long coastal line. Annually it has to face to the flood, typhoon, big tide... , which damage the houses, crops and kill the people also. It's put the duty to prevent those disasters. The 0 m. of sea level defined in geodesy is not always coincident with the boundary between seawater and land. So we can not to point out in the imagery wherever the 0 m. of sea level or boundary between seawater and land. The Landsat or SPOT imageries focus one region on the Earth at the same time for example: the Landsat passes the Vietnam territory during 9h30'-10h00, the SPOT: 10h30'-11h00'. By that time, the tide is up, it means the seawater level is higher than 0 m. level but the change of coastal line between imageries of different days can be considered as the change of coastal line. That why we can say: The results of image analysis of the periods 1973-1997-2000 in the coastal zone of Thua Thien - Hue show us the coastal change likes: erosion or deposit.... due to flood, wave, tide... As the remote sensing used in this study are from different sources (SPOT, Landsat, SOYUZ) we have to transfer them to unique base other way we have to standard the remote sensing data. Based on it and use the GIS we can calculate the areas of each object and evaluate the change. That's important to forecast some disasters and take the necessary measurements to limit the damage.

1. INTRODUCTION

Vietnam is a country which situated in the tropical region and has long coastal-line. Annually it has to face to the flood, typhoon, big tide... , which damage the houses, crops and kill the people also. It's put the duty to prevent those disasters.

2. STUDY AREA

Thua Thien - Hue is the one of provinces in central part of Vietnam has the former King's city Hue. Huong is the main river in Thua Thien - Hue. Areas of Huong river watershed is about 280,000 ha.. Flood season begins from the end of September to the end of November. Usually the peak of flood occurs in the end of October to the beginning of November (23/10/1996; 20/11/1998; 2/11/1999; 10/10/2000). In 1999 one of the biggest flood was occur here. It destroyed the houses, shrimps areas ... and the coastal line also.

3. METHODOLOGY

The 0 m. of sea level defined in geodesy is not always coincident with the boundary between seawater and land. So we can not to point out in the imagery wherever the 0 m. of sea level or boundary between seawater and land. The Landsat or SPOT imageries focus one region on the Earth at the same time for example: the Landsat passes the Vietnam territory during 9h30'-10h00, the SPOT: 10h30'-11h00'. By that time, the tide is up, it means the seawater level is higher than 0 m. level but the change of coastal line between imageries of different days can be considered as the change of coastal line.

The areas of potential flood can be defined by overlay of the Terrain Digital Model 3D with extraction from RADASAT imagery during flood time from 1986 to 2001 (Pict. 3). From Quang Dien to Hue there is the big change of coastal line, especially in Phu Vang (tab. 2). Here the coastal line become thinner and thinner and it was broken due to flood in the end of 1999 (see picture 1 and 2). The coastal line erosion occur intensively in the river mouths: Thuan An, Hoa Duan, Cau Hai ... (Tab. 2 and 3). In the Thuan An mouth the erosion within 30 years is measured about 100 - 250 m.

Category	Min. change area (*) (ha)	Max. change area(**) (ha)	Total area (ha)
1. New deposit area	6,8	106,90	353,6
2. New erosion area	12,57	199,61	722,4

(*) Minimum area has been observed in satellite imagery and calculated in GIS

(**) Maximum area has been observed in satellite imagery and calculated in GIS

The statistics calculated using ARC/INFO

Table 1: Coastal line change period 1973-2000
(Coastal region Thua Thien - Hue)

Distric	Deposit area (ha)		Erosion area (ha)	
	1973-2000	1999-2000	1973-2000	1999-2000
Quang Dien	106,4	0	5,4	37,6
Huong Tra	45,5	0,4	179,5	35,7
Hue city				
Phu Vang	165,9	17,7	317,2	11,0
Phu Loc	35,8	0	220,3	70,6
Total	353,6	18,1	722,4	154,9

Table 2: Deposit and erosion areas in 6 coastal districts

Coastal region	Deposit area (ha)		Erosion area (ha)	
	1973-2000	1999-2000	1973-2000	1999-2000
Mounth Thuan An region	32,5	0,5	189,7	51,5
Coastal line from Thuan An to Cau Hai	6,8	4,3	135,3	44,2
Cau Hai gulf	0	0	51,6	31,1

Table 3: Deposit and areas in different coastal regions

4. CONCLUSION

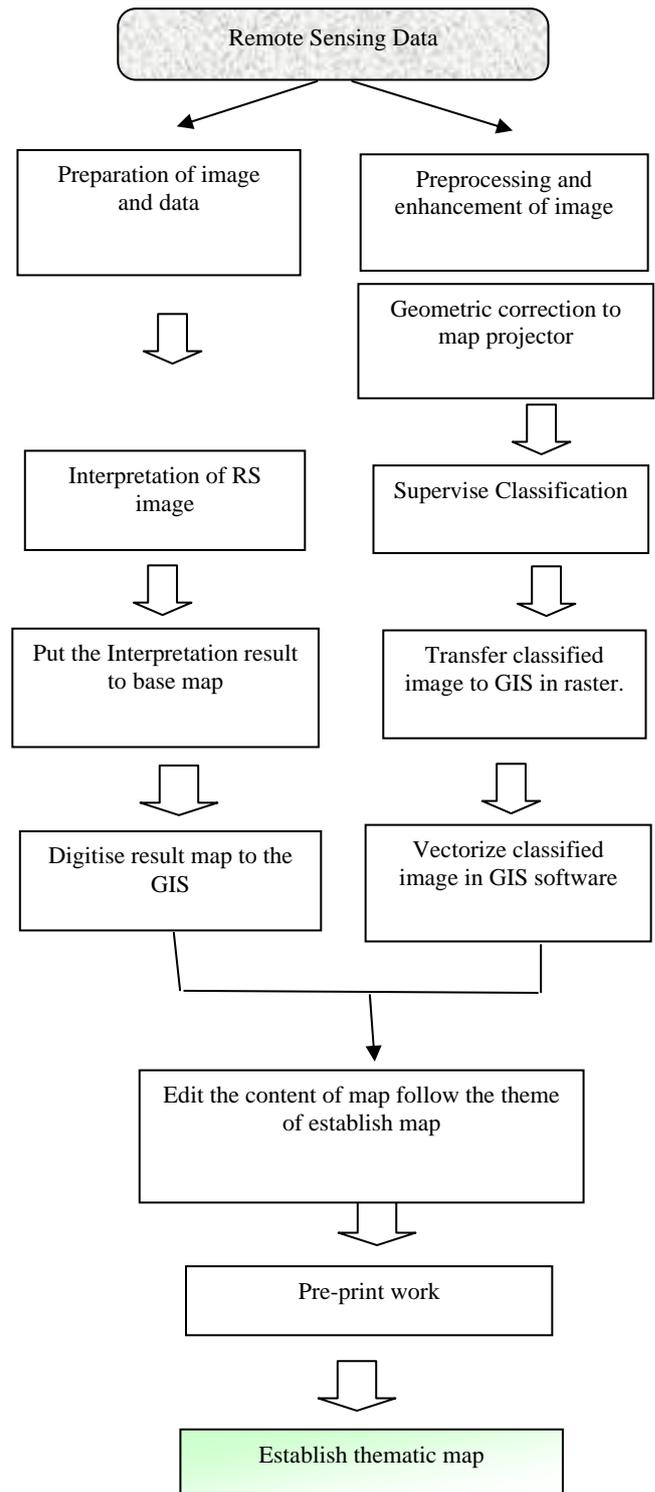
Remotely Sensed imagery is one of effective, objective and rapid tool independent on the weather is used for research and monitoring the disaster in watershed.

REFERENCE

Remote Sensing Note.Japan Association on Remote Sensing, Tokyo, 1991

ESA, ESRIN. First ERS Thematic Working Group Meeting on Flood Monitoring. 26-27 June, 1995 - ESRIN, Frascati - Italy

Malaysian Centre for Remote Sensing (MACRES). Microwave Remote Sensing Research and Development Program. Kuala Lumpur, Dec. 2000



Technological procedure