

## REMOTE SENSING TECHNOLOGY FOR FOREST FIRE AFFECTED AREAS DETECTION <sup>1</sup>

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### INTRODUCTION :

- GLOBAL CLIMATE CHANGE INCREASE OCCURRENCE AND RISK OF FOREST FIRE, AND THEREFORE IT IS AN URGENT NEED TO LOOK FOR METHODOLOGIES TO MONITOR FIRE'S IMPACTED AREA FOR BETTER LANDSCAPE MANAGEMENT.
- REMOTE SENSING TECHNOLOGY CAN BE APPLIED TO MONITOR BROADER AREA'S CONTINUOUSLY.

### OBJECTIVES :

- TO DETECT FIRE AFFECTED AREAS : EXPLORE METHODOLOGIES
- TO COMPARE FIRE OCCURRENCE IN 1998 AND 2000

### MATERIALS

- SPOT VEGETATION (99 SCENES)
  - 27 SCENES IN 1998 (9 MONTHS)
  - 36 SCENES IN 1999 (12 MONTHS)
  - 36 SCENES IN 2000 (12 MONTHS)
- LANDSAT (2 SCENES)
- HOTSPOT POSITION (DEPT. OF FORESTRY)
- DIGITAL BASE MAP (VECTOR DATA)



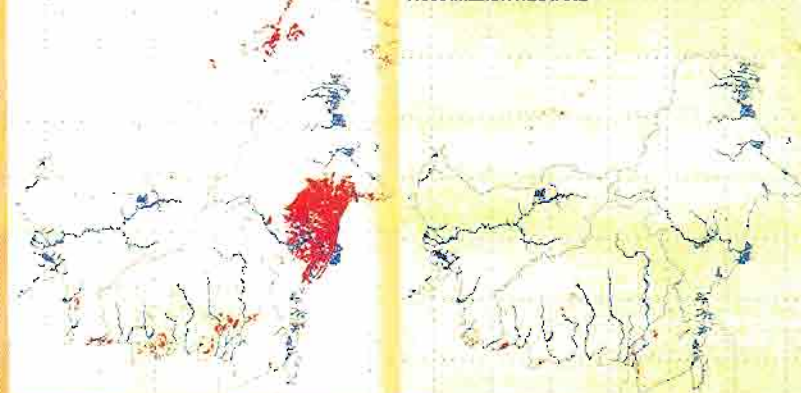
### METHODS :

- REGISTRATION DIGITAL IMAGES TO BASE MAP
- CONTRAST ENHANCING ALL IMAGES
- CALCULATE INDEX OF VEGETATION : NDWI (NORMALIZED DIFFERENCE WATER INDEX)  
 $(NIR - SWIR) / (NIR + SWIR)$
- APPLY LOCAL MAXIMUM FILTER, TO CALCULATE MONTHLY NDWI
- DETERMINE THRESHOLD VALUE, TO DIFFERENTIATE BURNED AND NON-BURNED AREAS

### RESULT FOR 1998 & 2000 FOREST FIRE

TOTAL AFFECTED AREAS IN 1998  
3.589 MILLION HECTARE

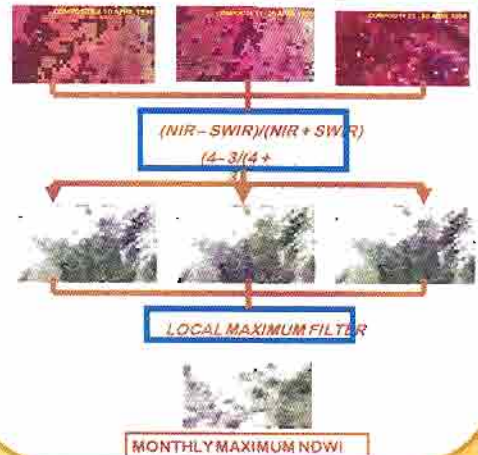
TOTAL BURNED AREAS 2000  
1.586 MILLION HECTARE



### CONCLUSION :

- INDEX NDWI OF SPOT VEGETATION CAN BE USED FOR FOREST FIRE AFFECTED AREA
- TOTAL AFFECTED AREAS OF FOREST FIRE IN 1998 = 3.5 MILLION HECTARES
- TOTAL AFFECTED AREAS OF FOREST FIRE IN 2000 = 1.5 MILLION HECTARES

### MONTHLY NDWI DATA DEVELOPMENT



### THRESHOLD VALUE

THRESHOLD VALUE IS UTILIZED TO DETERMINE BURNED (FIRE AFFECTED AREAS) OR NON-BURNED AREA.

- CRUCIAL STEP.
- LOCAL SPECIFIC : DEPEND UPON ENVIRONMENT (LANDSCAPE CHARACTER)

AFTER EXPLORING AND INVESTIGATED THE DATA WE DECIDED :

- NEGATIVE VALUE OF NDWI (UNDER 0) DETERMINED AS FIRE AFFECTED AREAS
- POSITIVE VALUE OF NDWI DECLARED AS NON-FIRE AFFECTED AREAS

1) PRESENTED AT PARALEL SESSION COP13 : SUPPORT AND INITIATIVE OF HIGHER EDUCATION FOR ADAPTATION AND MITIGATION OF CLIMATE CHANGE, DEN PASAR - BALI : 5-6 DECEMBER 2007

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