ESA - MOST Dragon 2 Programme

2011 DRAGON 2 SYMPOSIUM

中国科技部-欧洲空间局合作 "龙计划"二期

"龙计划"二期2011年学术研讨会

ID 5258: FOREST FIRES
PROJECT SUMMARY

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1.- DATA COLLECTION

2.- EARLY WARNING TECHNIQUES

3.- FOREST FIRE MONITORING

4.- BURNT SCAR AND DAMAGE ESTIMATION

5.- CO/CO2 EMISSIONS

6. FUTURE WORKING PLANNING

1.- DATA COLLECTION

➢ SATELLITE DATA COLLECTION

Production	Years	Total
SCI_NL__1P	2005,2008	50
SCI_NL__2P	2003, 2004,2005	653
SCI_0L_2P	2002, 2003, 2004,2006	227
GOMS_0_3-NO_2_L2	May 25 to 31, 2006	41
ASAR	March to May, 2009	75
FY 3A/B	2009,2010, 2011	21800
HJ	2009,2010, 2011	80
Total		22926

1.- DATA COLLECTION

➢ SATELLITE DATA COLLECTION

Production	Years	Total
DEIMOS-1	2011	CHINA Coverage

1.- DATA COLLECTION

➢GROUND INFORMATION COLLECTION

- **Forest Fire Information**
  The fire information includes fire location, on fire time, fire duration, etc.

- **Background Information**
  Vegetation map, Forest map, Administrative Boundary, etc.

- **Field work**
  Burnt Area, Fuel Moisture Content, etc.

2.- EARLY WARNING TECHNIQUES

- To get the method to monitor forest greenness
- To develop a suitable early warning technique

2.- EARLY WARNING TECHNIQUES

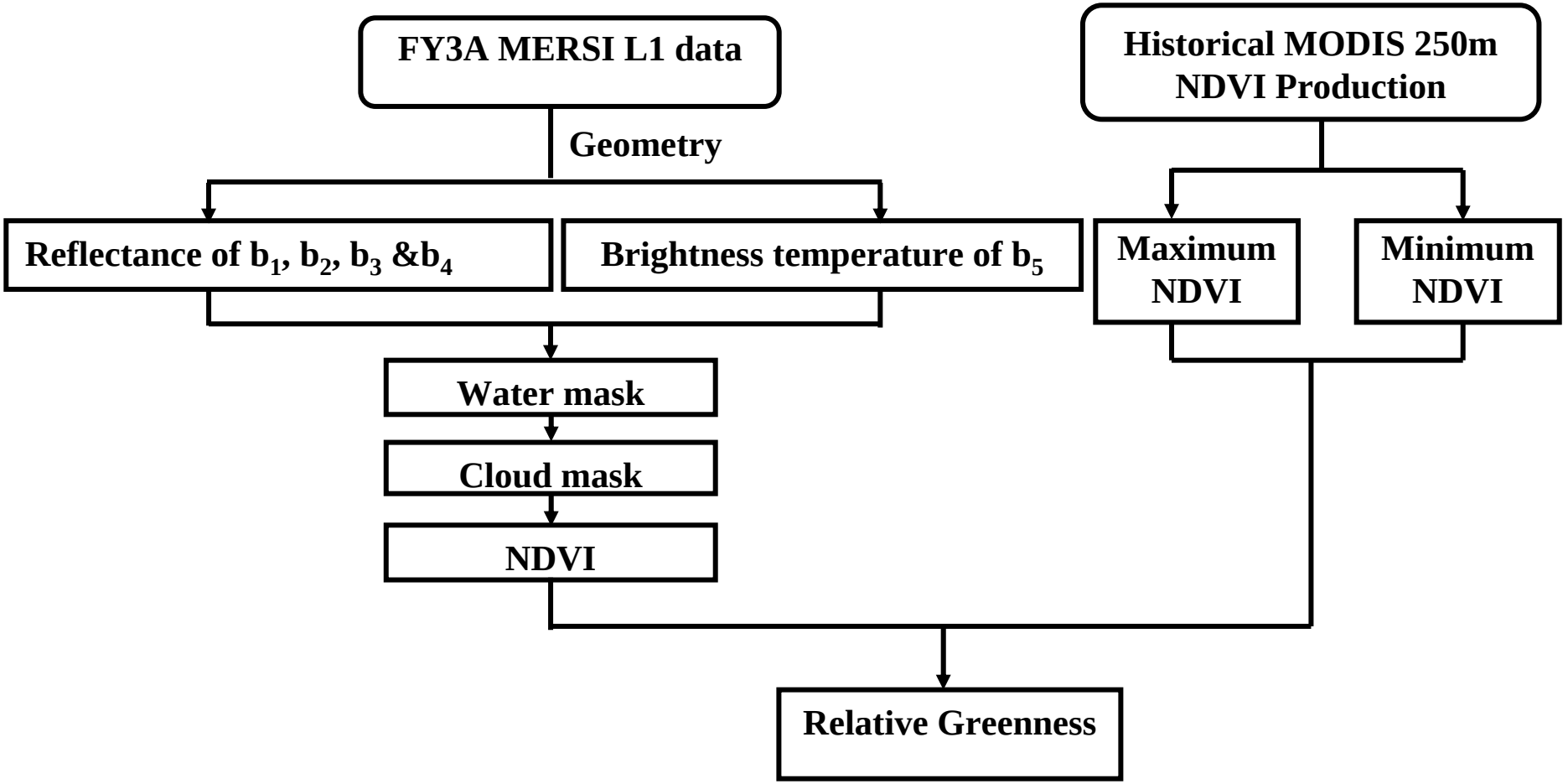
DRAGON 1

Monitoring Forest Fires in CHINA using ENVISAT-AATSR

DRAGON 2

Monitoring Forest Fires in CHINA using FY3A/B MERSI

2.- EARLY WARNING TECHNIQUES



2.- EARLY WARNING TECHNIQUES

RESULTS

- Relative Greenness can stand for the growth of Forest
- The growth is differenced between broadleaf forest and needleleaf forest
- The growth trend is differenced between different location

3.- FOREST FIRE MONITORING

- To detect burning in the vast forest areas
- To monitor fire combustion phase in the key regions

3.- FOREST FIRE MONITORING

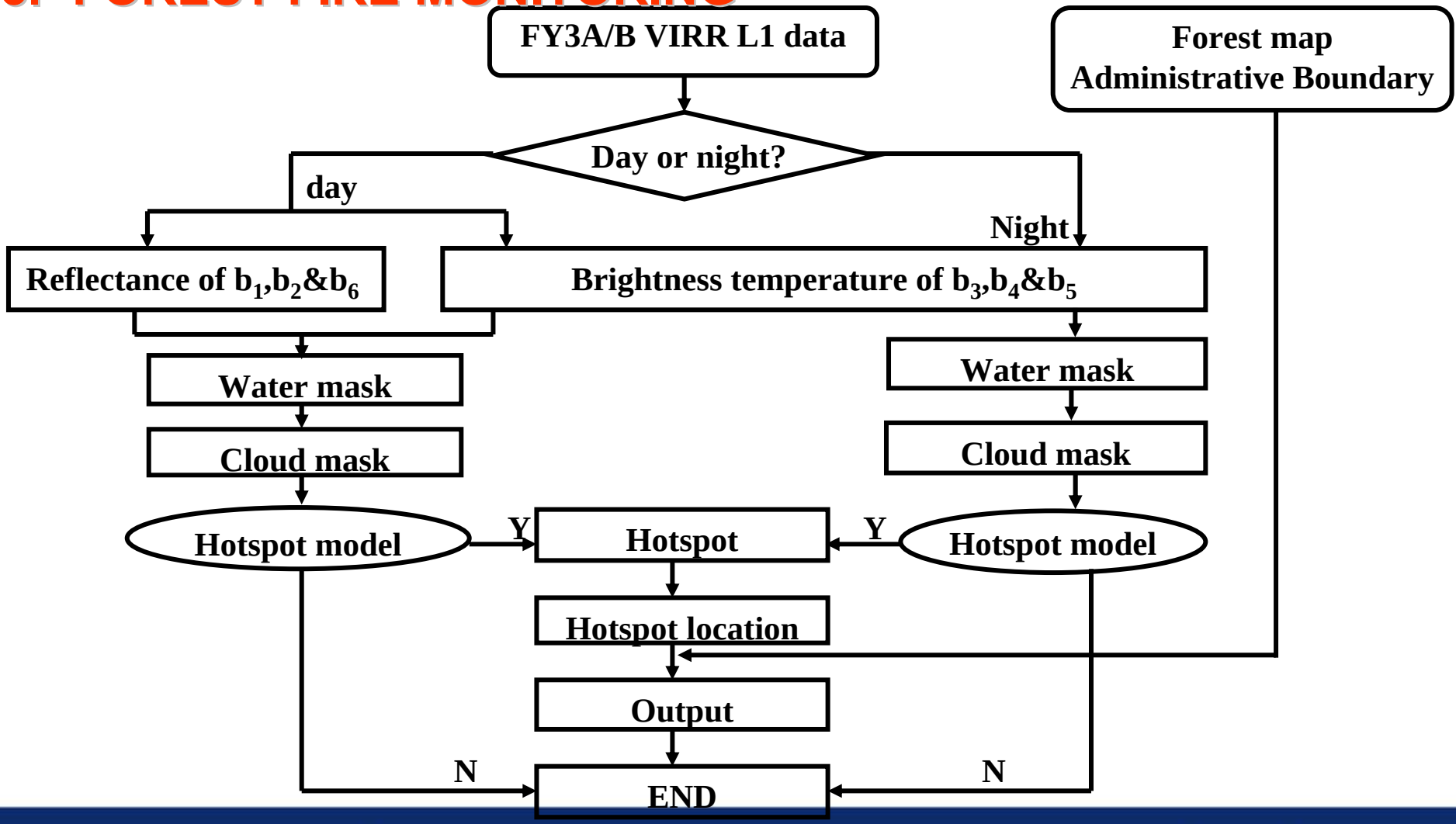
DRAGON 1

Monitoring Forest Fires in CHINA using ENVISAT-AATSR

DRAGON 2

Monitoring Forest Fires in CHINA using FY3A/B VIRR

3.- FOREST FIRE MONITORING



4.- BURNT SCAR AND DAMAGE ESTIMATION

- To detect very small burnt scars (few ha‘s)

- To retrieval the NDVI recovery and the NDVI percentage lost after the fire

4.- BURNT SCAR AND DAMAGE ESTIMATION

DRAGON 1

Burnt scar in CHINA using ENVISAT-MERIS

DRAGON 2

Burnt scar in CHINA using DEIMOS-1

4.- BURNT SCAR AND DAMAGE ESTIMATION

$ALGORITHM_{Burnt\ Forest\ Surface} = f(\Delta Red, \Delta Green, \Delta NIR, (\Delta-\delta)NDVI)$

$Ref\ (NIR)_{burnt} < 50\ \%Ref(NIR)_{no\text{-}burnt}$

$Ref\ (RED)_{burnt} < 40\ \%Ref(RED)_{no\text{-}burnt}$

$Ref\ (GREEN)_{burnt} < 30\ \%Ref(GREEN)_{no\text{-}burnt}$

Contextual analysis 3x3: (R, G, NIR) average reflectances ± 1.σ

$Min\ (NDVI_{no\ burnt}) \geq 0{,}9\ Max\ (NDVI_{burnt})$

5.- CO/CO2 EMISSIONS

- To isolate the CO/CO2 fire emissions from background emissions
- To determine the emissions from medium/large fires

6. FUTURE WORKING PLANNING

- **EARLY WARNING TECHNIQUES**
  - To validate indicator of vegetation
  - To get the Fire danger Index

- **FIRE MONITORING TECHNIQUE**
  - To Validate the fire detection method.
  - To validate the damage assessment method.

- **BURNT SCAR AND DAMAGE ESTIMATION**
  - **To Validate the burnt area method.**
  - **To validate the damage retrieval by comparison with real damage.**

- **CO/CO2 EMISSIONS**
  - **To validate the methodology used**
  - **To get a relationship between vegetation coverage, fire intensity and CO/CO2 emissions**

PUBLICATIONS

(1) QIN Xian-lin, Deng Guang, LI Zeng-yuan. Forest Canopy Moisture Content Monitoring Method Using HJ-1B IRS Data, the 34th International Symposium on Remote Sensing of Environment, 10–15 April, 2011, Sydney, Australia.

(2) Qin Xianlin, Li Zengyuan, Zhangxu et al. Damaged Assessment Methodology for Large Forest Fires. Proceeding of the Symposium, Dragon 2 Programme Mid-Term Results 2008-2010, 17-21, May, 2010, Guilin City, P.R.China.

MANY THANKS FOR YOUR KIND ATTENTION