REGIONAL SOUTHEAST ASIA WILDLAND FIRE SCIENCE AND MANAGEMENT NETWORK AND THE CHALLENGE TO REDUCE GREENHOUSE GAS EMISSION DUE TO FOREST FIRES AT REGIONAL LEVEL

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CONTENT

➢ **ASEAN Agreement on Transboundary Haze Pollution**

➢ **SEA-FIRE DANGER RATING SYSTEM (2002-2011)**

➢ **SOUTH EAST ASIA REGIONAL INFORMATION NETWORK (SEARIN)**

➢ **REGIONAL SOUTHEAST ASIA WILDLAND FIRE SCIENCE AND MANAGEMENT NETWORK**

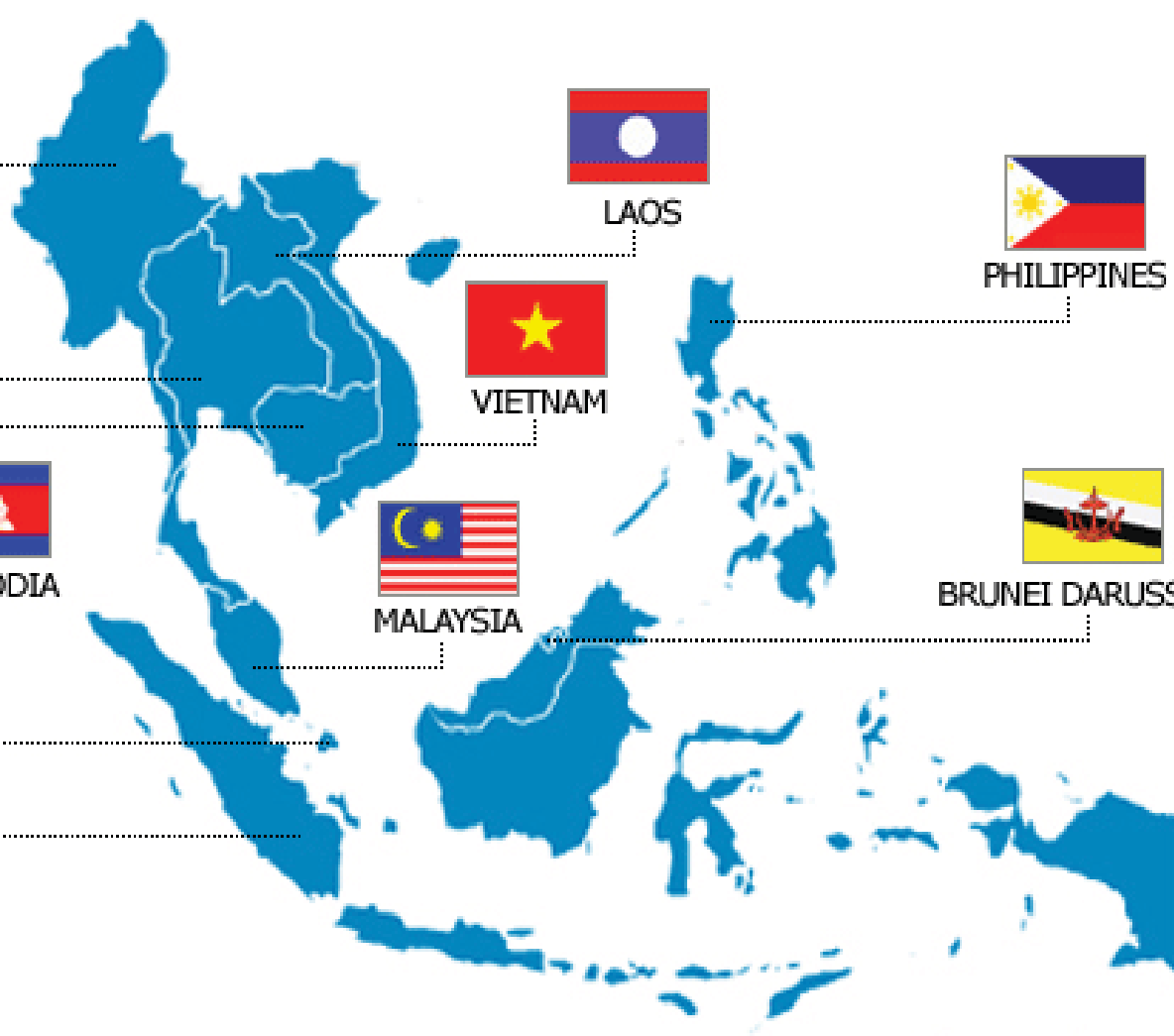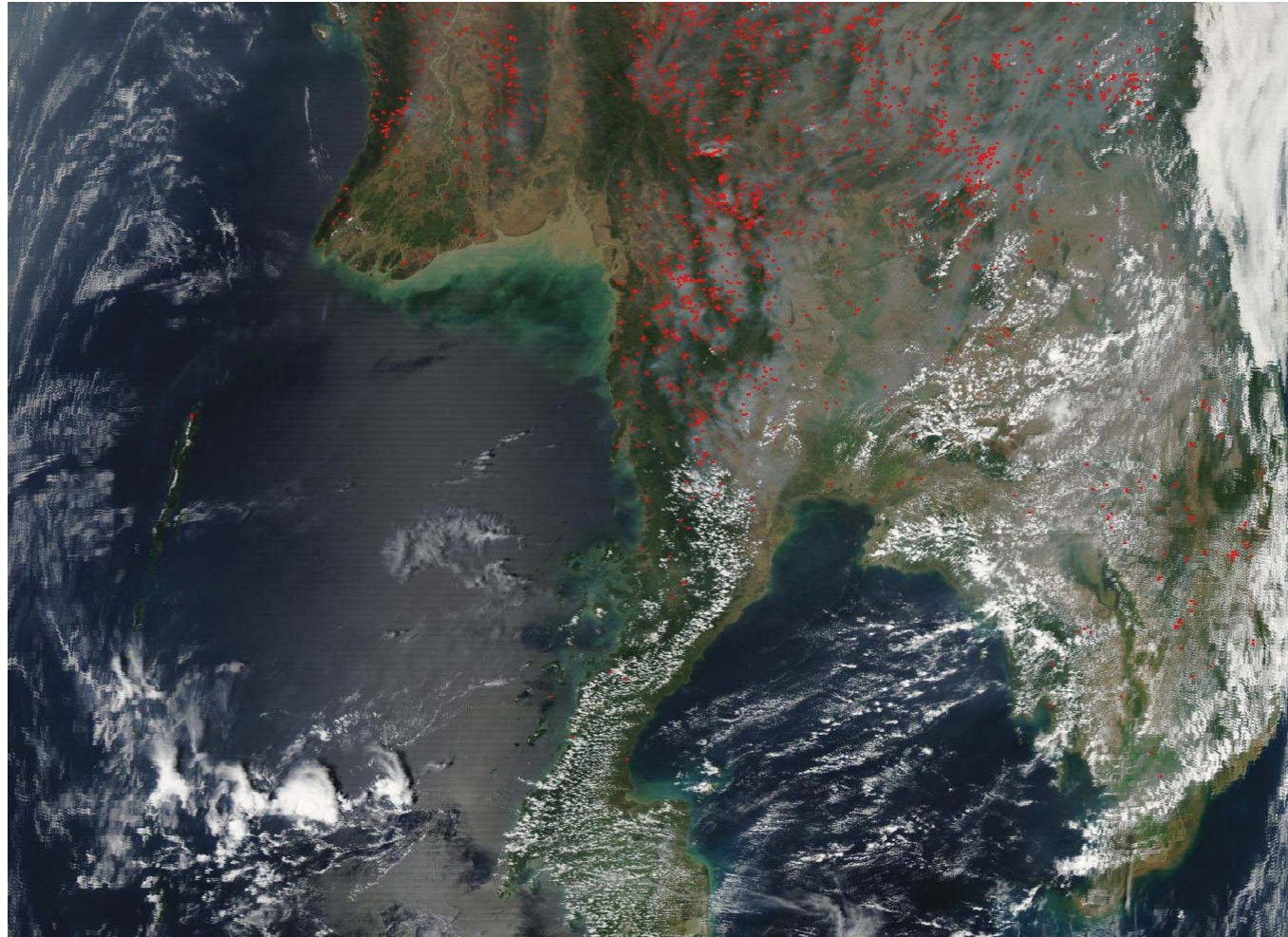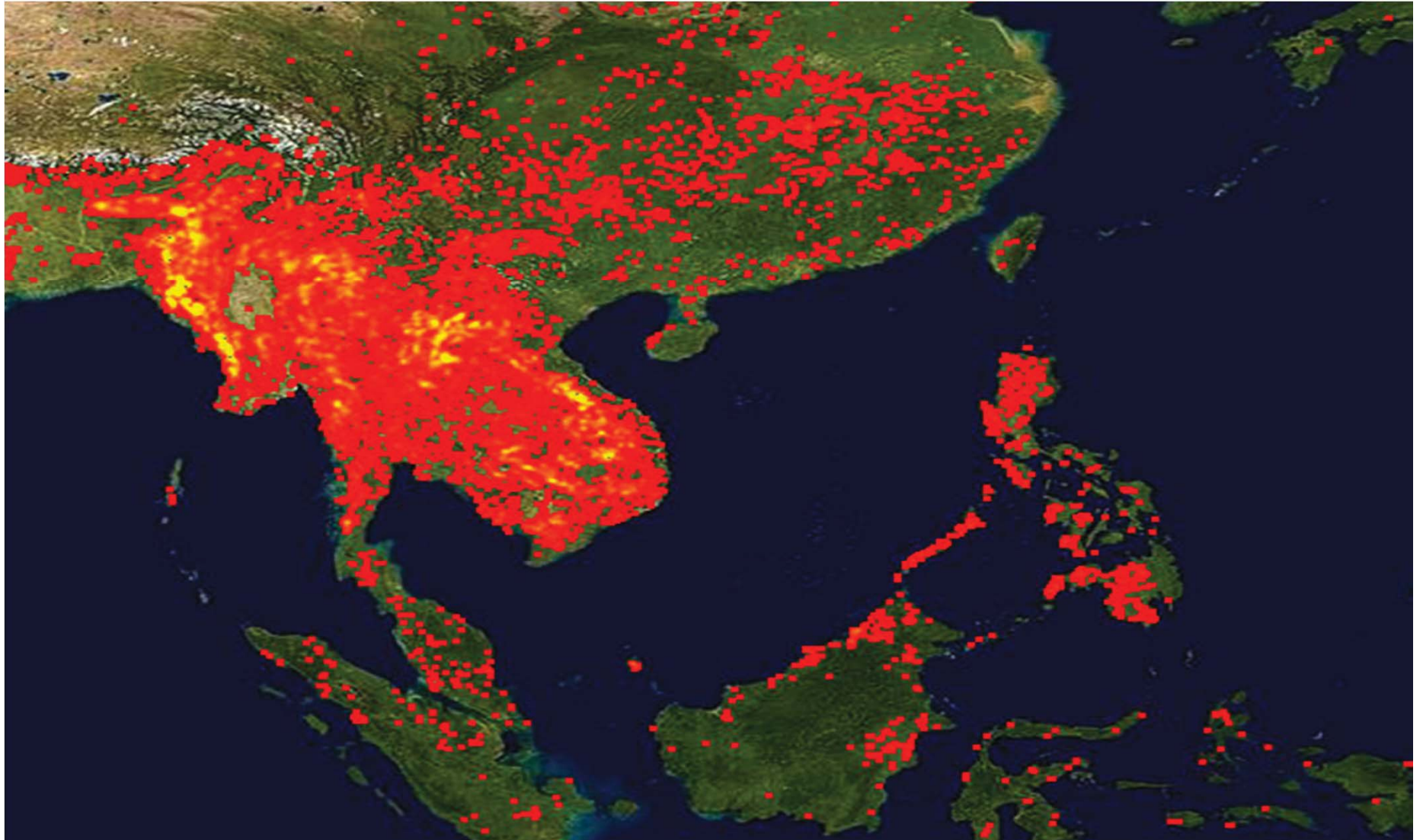# ASEAN

GFMC, 01 MARCH 2012

Smoke from open burning of agricultural waste is depicted by this image captured by the MODIS instrument on NASA's Aqua satellite on 01 March 2012 for 250 m resolution image click on the image).

Bangkok Post, 18 March 2012

BIOMASS BURNING IN SE-ASIA 2010
(Anja Hoffmann, 2011)

ASEAN Agreement on Transboundary Haze Pollution

- Signed on 10 June 2002 in Kuala Lumpur by all ASEAN Member States
- Entered into force on 25 November 2003

OBJECTIVE:

Prevent and monitor transboundary haze pollution as a result of land and/or forest fires which should be mitigated, through concerted national efforts and international cooperation

ASEAN Agreement on Transboundary Haze Pollution

Principles

- Ensure that activities within the jurisdiction do not cause damage to the environment and harm to human health

- Strengthen cooperation and coordination

- Take precautionary measures where there are threats of serious or irreversible damage

- Manage natural resources in a sustainable manner

- Involve all stakeholders

ASEAN Agreement on Transboundary Haze Pollution

Contains :

- Monitoring and assessment

- Prevention

- Preparedness

- National and joint emergency response

- Procedures for deployment of people, materials and equipment across borders

- Technical cooperation & scientific research

Implementation of the Haze Agreement

Prevention

- Guidelines for implementation of zero burning policy
- Dialogues with plantation and timber companies
- Guidelines for controlled burning practices
- Community-based fire management programmes through pilot projects in fire-prone areas
- Demonstrations and workshops
- Public and community awareness programmes
- Training and capacity building on investigation, prosecution and enforcement against open burning

Monitoring

- ASEAN Specialised Meteorological Centre (ASMC) based in Singapore - provision of hotspot and smoke haze maps, satellite imageries, monthly weather & haze outlook, haze modelling

- Comprehensive regional early warning system to be developed

- Workshop involving relevant experts and agencies to discuss on how to enhance the reporting of weather and haze outlook, incl. simulation/ modeling of haze transport and incorporating data on PM10 which will be a useful indicator to track the extent of haze – early 2009 in Singapore

Mitigation / Fire Suppression

- Fire Suppression Mobilisation Plans in fire-prone areas

- Online regional inventory of fire-fighting resources to facilitate sharing of resources during emergencies

- Standard Operating Procedures (SOP) for monitoring, assessment and joint emergency response

- Regional table-top and simulation exercises to strengthen coordination and response

- **Panel of ASEAN Experts on Fire and Haze Assessment and Coordination Sub-Regional Groups**

> Southern ASEAN region
  Brunei Darussalam, Indonesia, Malaysia, Singapore, Thailand

➢ Northern ASEAN region (Mekong sub-region)
  Cambodia, Lao PDR, Myanmar, Thailand,
  Viet Nam

- **Sub-Regional Ministerial Steering Committee (MSC) on Transboundary Haze Pollution**
- **Sub-Regional Ministerial Steering Committee (MSC) on Transboundary Haze Pollution in the Mekong Sub-Region (MSC Mekong)**
- **Technical Working Group on Transboundary Haze Pollution in the Mekong Sub-Region (TWG Mekong)**

ASEAN HAZE ACTION ONLINE

http://haze.asean.org

- daily-updated information on fire-and-haze and info on ASEAN cooperation on transboundary haze pollution
- consist of public information and intranet services
- fire-and-haze situation reports
- hotspot and smoke haze maps from ASMC
- online inventory of fire-fighting resources
- online Regional and National Detailed Implementation Plans
- database of projects & documents

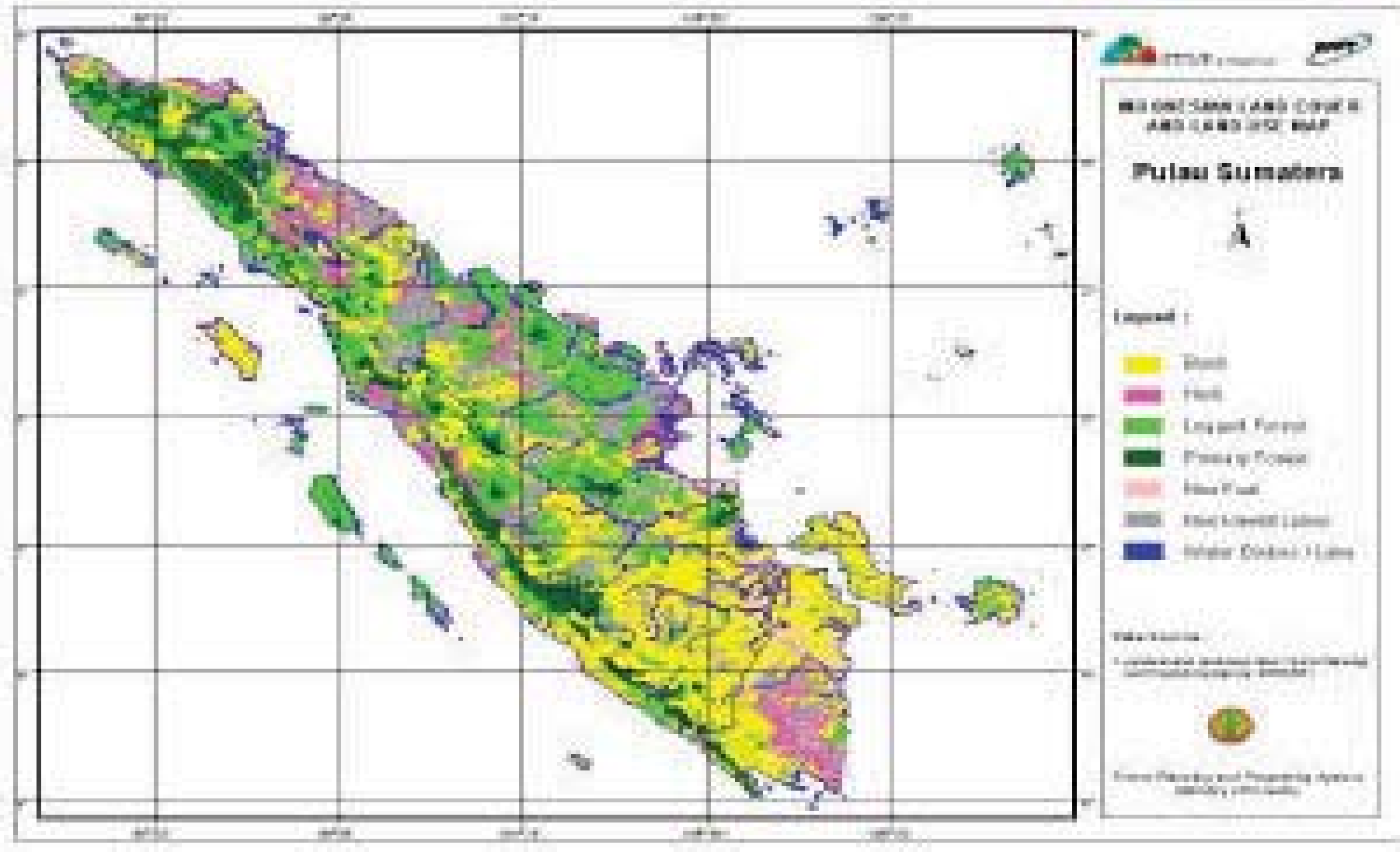# SEA-FIRE DANGER RATING SYSTEM (2002-2011)

The Southeast Asia FDRS

- The Southeast Asia FDRS Project was regional Canadian International Development Agency initiative.

- The project is executed by the Canadian Forest Service with partner agencies in Indonesia, Malaysia, Brunei,

  and at the ASEAN level.

- Its purpose is to enhance the capacity of resource management organizations at regional, central and local levels in Southeast Asia to manage vegetation fires and associated haze.
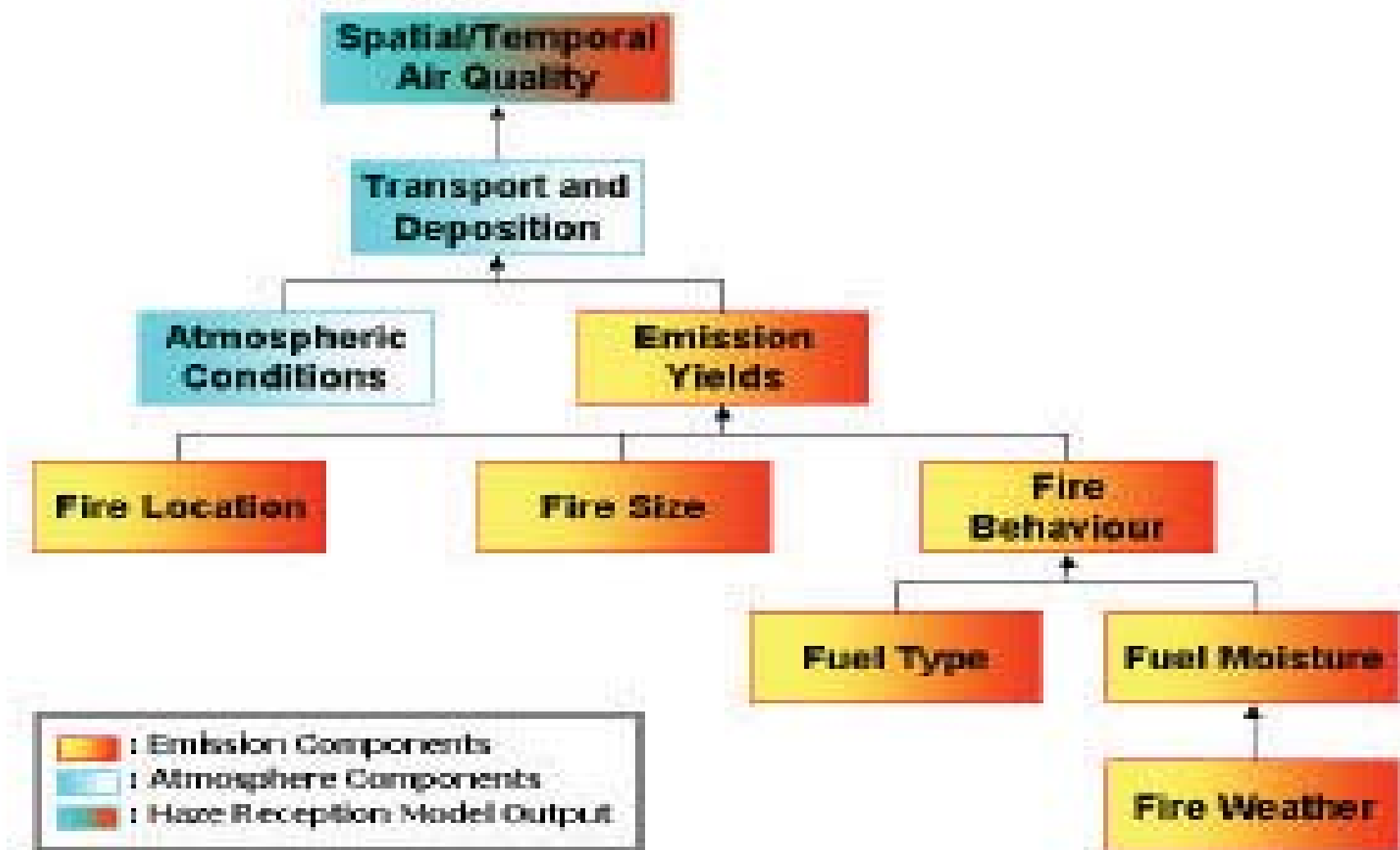
SEA-FIRE DANGER RATING SYSTEM

> The purpose of the Southeast Asia FDRS is to provide early warning of critical burning periods when emissions from land and forest fires will be greatest or most damaging.

➢ Using this advance information, fire management and regulating agencies can minimize haze problems by implementing land burning restrictions and enhancing forest fire detection in anticipation of serious burning conditions.
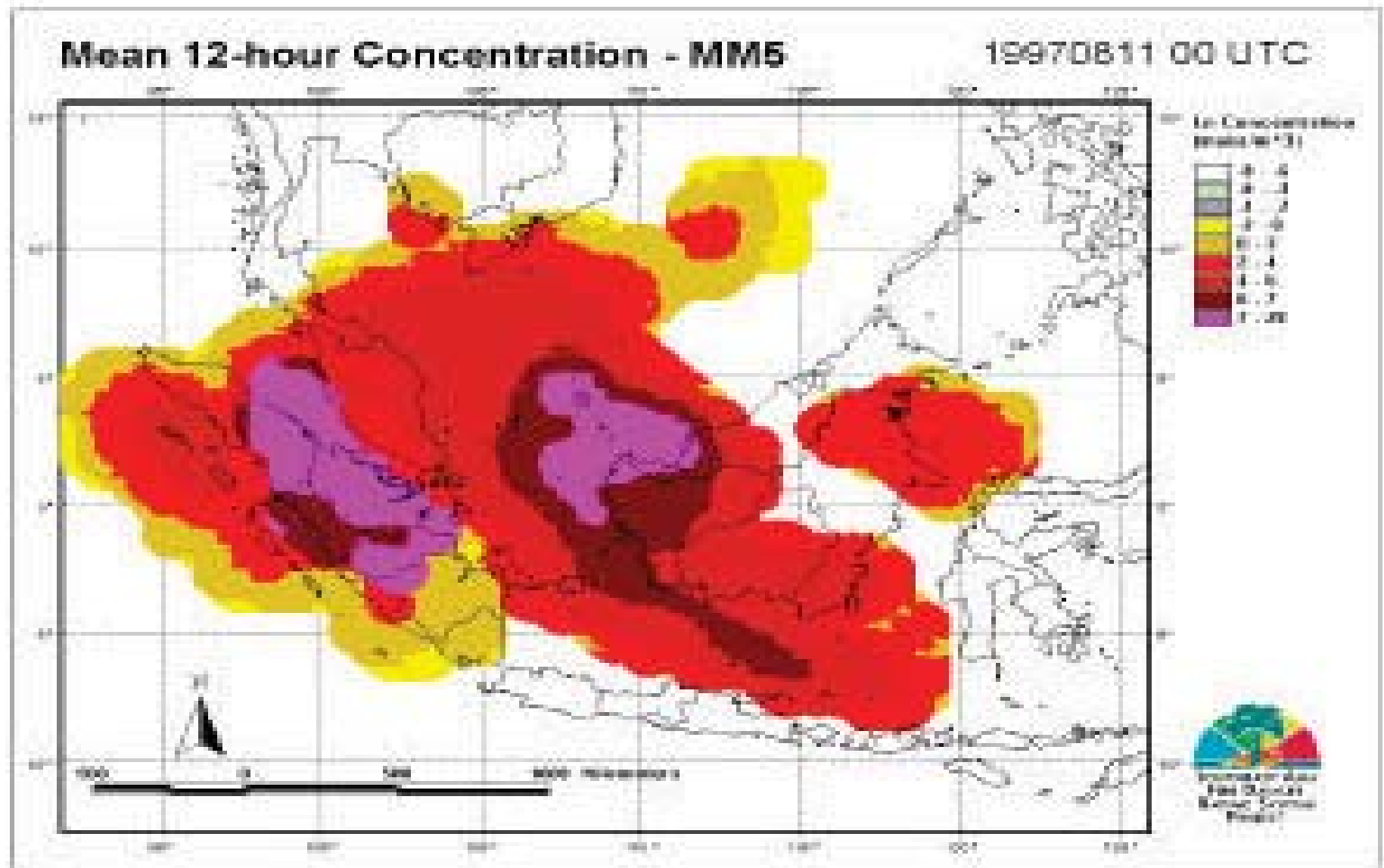
Fuel Mapping

FDRS-Haze Forecasting

Forecasting results for the 1997 haze event

SEA-FIRE DANGER RATING SYSTEM

- The operational FDRS early warning systems exist across Southeast Asia to identify the forest/land fires conditions.

- These systems have been linked to the operational procedures of land management agencies to trigger fire prevention and pre-preparedness measures.

- The operational FDR Systems are being run at:

** Malaysian Meteorological Service (MMS) for regional ASEAN

** Indonesian Meteorological, Climatological and Geophysical Agency (BMKG) for Indonesia

** Indonesian National Institute of Aeronautics and Space (LAPAN) using the assimilation of satellite data for western Indonesia

(LAPAN, 2011)

SOUTH EAST ASIA REGIONAL INFORMATION NETWORK (SEARIN)

➢ 1993: Network is established in Manila, Philippines for development of an operational methodology for monitoring LUCC

➢ 1994: common method and data collection protocols were initiated

➢ 1998 :

- all the participating countries have produced their country reports, in hard and soft copies.

- Individual countries also set their own web page in LUCC project which are linked to SEA START network

> 1999:

- Develop case studies to determine deforestation dynamics
- Regional network was expanded through involvement of more scientists and case studies

> 2000:

- Development of regional integrated metadata system was also initiated (SEA START RC, DIF)

> 2004:

- SE-Asia Burnt Area Workshop in Selangor, Malaysia

> 2009

- NASA-LCLUC Science Team Joint Meeting with MAIRS, GOFC-GOLD and SEA START in Khon Kaen Thailand

Situations of Network

- Lack of funding for projects to keep up activities and strength of the network

  -> scientists work on their own resources

- Network is not recognized by local government

  -> difficult to take further actions on mitigation process

(Anja Hoffmann, 2011)

REGIONAL SOUTHEAST ASIA WILDLAND FIRE SCIENCE AND MANAGEMENT NETWORK

- ➤ Part of GLOBAL FIRE MONITORING CENTER (GFMC)
- ➤ CONSIST OF FOREST FIRES PANEL EXPERT
- ➤ HAVE KNOWLEDGE AND EXPERIENCES AT DIFFERENT TERM AND CONDITION
- ➤ TRY TO STRENGTHEN THE COLLABORATION AMONG ASEAN COUNTRIES TO SOLVE THE PROBLEMS ON FIRES THROUGH AVAILABLE DATA PROVIDED BY INSTITUTIONS AT EACH COUNTRY OF ASEAN

THROUGH THE NETWORK

➢ CONDUCT RESEARCH AND DEVELOPMENT

➢ TRAINING AND CAPACITY BUILDING

➢ SEMINAR/WORKSHOP (TECHNICAL/NON TECHNICAL)

➢ EXCHANGE SCIENTIST, KNOWLEDGE AND EXPERIENCES

➢ FIELD WORK

➢ INFORMATION DISTRIBUTION

➢ COMMUNITY BASED FIRE MANAGEMENT

SOUTHEAST ASIA ISSUE ON THE FOREST FIRE RESEARCH

➢Fire and emission regarding the greenhouse gas produced during biomass burning from different land-use

➢Modelling the greenhouse gas produce during burning its content and dispersion

➢The changing of Land use by using fire and the greenhouse gas produced

➢The role of moratorium fire and logging increased above ground biomass and carbon stock

➢Wildfire and carbon management in peat fires

➢Reduction emission through community based forest fire management

➢Contributing carbon emission reduction by monitoring and controlling wildfire

- Fire fighting using MODIS hotspot
- The impact of prescribed fire to the small scale agriculture on peat
- Evaluation of burned area and carbon emission in Mega Rice Project
- GHG inventory at different land use due to fire
- Trace gas produce during burning
- The impact of fire to the wildlife
- Using canal blocking to give better environment for burned peat swamp forest

Table　Percentage articles classified in related forest fire topics (Ainuddin et al, 2011)

Topic	No. of articles	Percentage
Fire impact	127	17.4
Atmospheric pollution	96	13.1
Remote sensing	96	13.1
Fire ecology	76	10.4
Policy	40	5.5
Human-Fire interaction	39	5.3
Carbon	37	5.1
Fire management	30	4.1
Fire technology	29	4.0
Forest fuel	27	3.7
Palaeoclimatogy and palaeoecology	20	2.7
Fire risk assessment	19	2.6
Forest rehabilitation	19	2.6
Biomass emissions	16	2.2
Forest landscape	15	2.1
Fire climate	10	1.4
Climate change	9	1.2
Fire history	9	1.2
Fire modeling	9	1.2
Atmospheric chemistry	6	0.8
Biogeography	2	0.3

Table Number of articles published in respective Journals (Ainuddin et al, 2011)

Journal Title	No. of articles	Percentage
Atmospheric Environment	42	5.8
Journal of Geophysical Research D: Atmospheres	38	5.2
Chinese Journal of Applied Ecology	23	3.2
Forest Ecology and Management	23	3.2
International Journal of Remote Sensing	14	1.9
Mitigation and Adaptation Strategies for Global Change	14	1.9
Journal of Natural Disasters	13	1.8
Ecological Research	12	1.6
Biodiversity and Conservation	9	1.2
Chinese Journal of Ecology	9	1.2
Beijing Linye Daxue Xuebao / Journal of Beijing Forestry University	8	1.1
International Journal of Wildland Fire	8	1.1
Journal of Forest Research	8	1.1
Palaeogeography, Palaeoclimatology, Palaeoecology	8	1.1
Atmospheric Chemistry and Physics	7	1.0
Ecological Modelling	7	1.0
Environmental Monitoring and Assessment	7	1.0
Journal of Tropical Forest Science	7	1.0
Nature	6	0.8