



Global Wildland Fire Forecasting Using Space Technologies

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Global Effects of Fires

- Smoke crosses national borders, adversely affecting human health and security.
- Fires produce about 25% of the world's total greenhouse gas emissions.
- Secondary disasters:
 - e.g., desertification, floods, biodiversity loss



Global Fire Map
31 Jan - 9 Feb 2006
NASA MODIS Rapid
Response System



FLAMA Mission Statement

“Our mission is to design an adaptable, accessible global information framework that enables regional wildfire forecasting.”





Information & Forecasting Needs

- Information
 - Cooperative sharing of data
 - Standardized data formats
 - Centralized access
 - Transparency and security
- Forecasting
 - Fusion of scientific + social data
 - Timely maps
 - Validation of existing models
 - Improved forecasting models



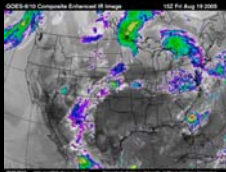


Input Parameters

Scientific Parameters



Fuel



Weather



Topography

Response Capability Parameters



Health Services



City Maps



Population Maps

Activity Monitoring



Tourism



Prescribed Burning



Camping

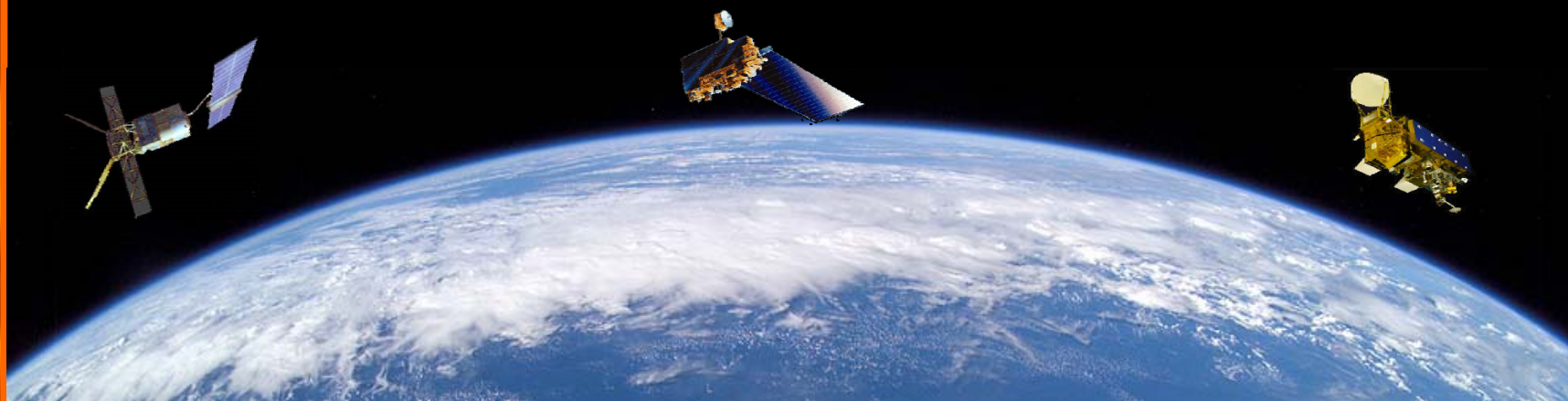


Economic Activity



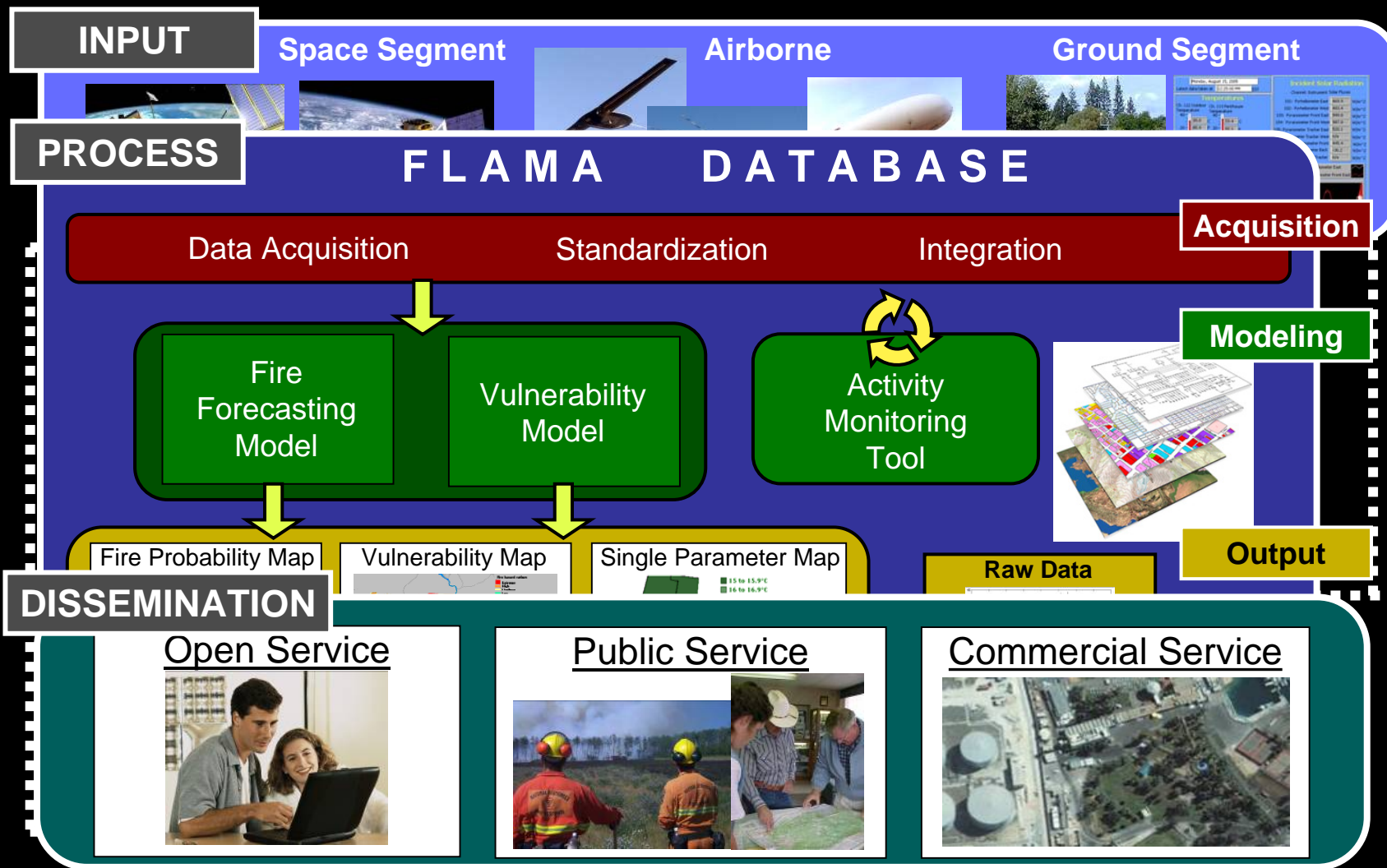
Use of Space Resources

- FLAMA relies heavily upon Earth observation satellites in order to obtain its input parameters.
- Visible, Infrared, Multispectral, Microwave SAR
- Polar low Earth orbit: high spatial resolution
 - AVHRR, MODIS, ASTER, TRMM VIRS, ERS ATSR, ERS SAR, ENVISAT AATSR, ENVISAT MERIS, SPOT VGT, LANDSAT TM, LANDSAT ETM+, BIRD, RADARSAT
- Geostationary orbit: high temporal resolution
 - GOES imager, MSG SEVIRI, MTSAT-IR JAMI





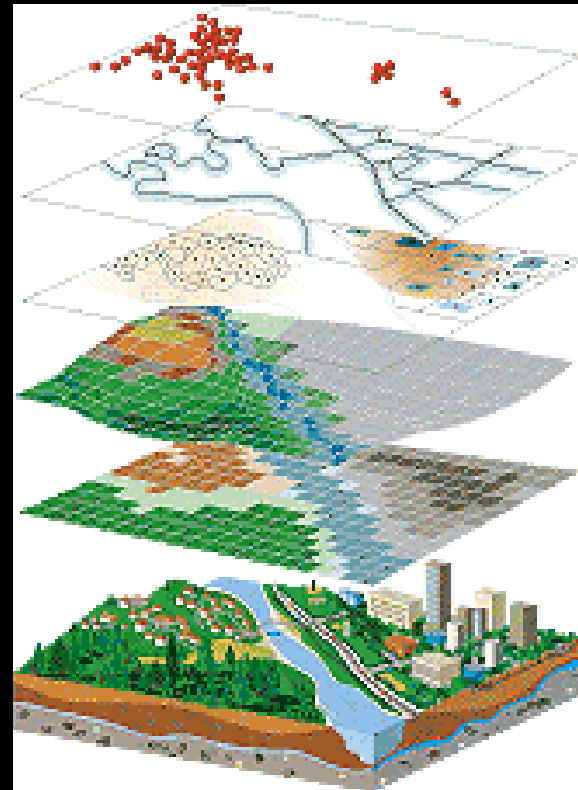
FLAMA System Design





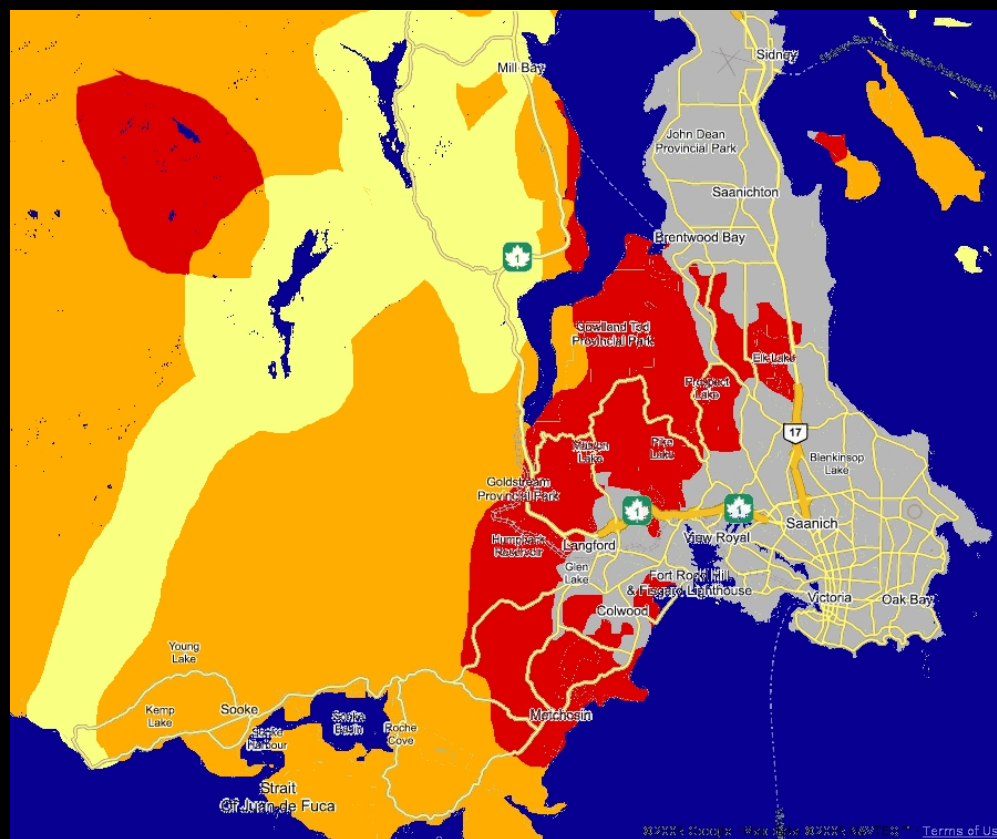
Output Products

- Single Parameter Maps
 - temperature, soil moisture
- Fire Probability Maps
- Fire Vulnerability Maps
- Additional Products
 - monitoring of CO₂ emissions, biomass burning, volcanic eruptions, land cover evolution





Fire Risk Assessment Example



Probability



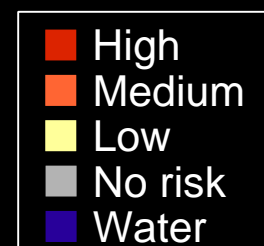
Slope



Water



Vulnerability





Products end services

	Open Service	Public Service	Commercial Service
Users	Individuals	Governments Public Institutions Research Institutes	Private Entities Tourism Industry Insurance Companies
Product	Low Resolution General Information	High Resolution	Upon Request Highest Resolution
Cost	Free via Internet	Free or At Cost	Fee
Limitation	Registration on Website	Registration on Website	Availability of Data Security Limitations





FLAMA Funding Sources



Grants - Loans

- World Bank or other Development Banks loans.
- United Nations ISDR funds
- DIPECHO (European Commission) funds
- World Bank BioCarbon funds

Public Customers

National disaster mitigation program funds

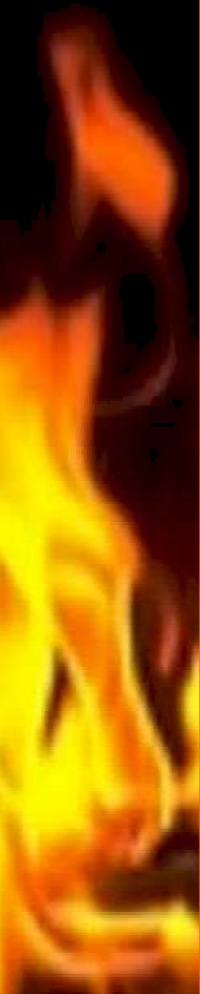
Private Customers

Ecotourism – insurance and timber industries

UN Involvement with Wildland Fires



- FAO (Food & Agriculture Organization)
- OCHA (Office for the Coordination of Humanitarian Affairs)
- UNEP (United Nations Environment Programme)
- WHO (World Health Organization)
- WMO (World Meteorological Organization)
- GOFC-GOLD (Global Observation of Forest Cover - Global Observation of Landcover Dynamics)
- ISDR (International Strategy for Disaster Reduction)
 - Wildland Fire Advisory Group (established 2001)



Relevant Global Conventions

- CBD (Convention on Biological Diversity)
- UNCCD (Convention to Combat Desertification)
- UNFCCC (Framework Convention on Climate Change)
- International Charter on Space and Major Disasters
- The Wildland Fire Advisory Group as part of the UN-ISDR has drafted a Framework for the Development of the International Wildland Fire Accord.



FLAMA Institutional Structure (1)

- UN agencies alone cannot meet all of the needs to promote sustainable fire management: international community
- Support from governments and NGOs is crucial
- “International Wildland Fire Accord”: legal implications and consensus
- Proposed three-phased approach towards a legally binding instrument



FLAMA Institutional Structure (2)

- FLAMA is proposed as a not-for-profit NGO
- An Advantageous Structure:
 - Financial advantages
 - Ease of establishment
 - Possibilities of Membership/Observer status within Earth Observation entities (such as GEOSS) & UN Agencies (FAO, WMO, ICAO, ITU, etc.) and joining Global Wildland Fire Alliance
- FLAMA is a “new approach” for cooperation at all levels (FAO Min. Meeting, Rome March 2005)
- Paves the way for the long-term approach



FLAMA Innovations & Advantages

- “One-stop shop”
- Activity monitoring
- User Feedback
- Global scope with local sensitivity
- Integrated approach to information assimilation, creation, dissemination
- Decision support tool
- Low cost





Looking Forward

- All phases of forest fires
- Distributed information network
- Other natural disasters
- International cooperation





Thank You

