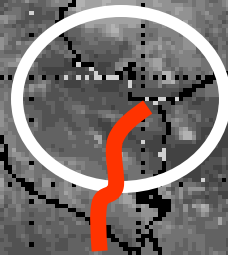


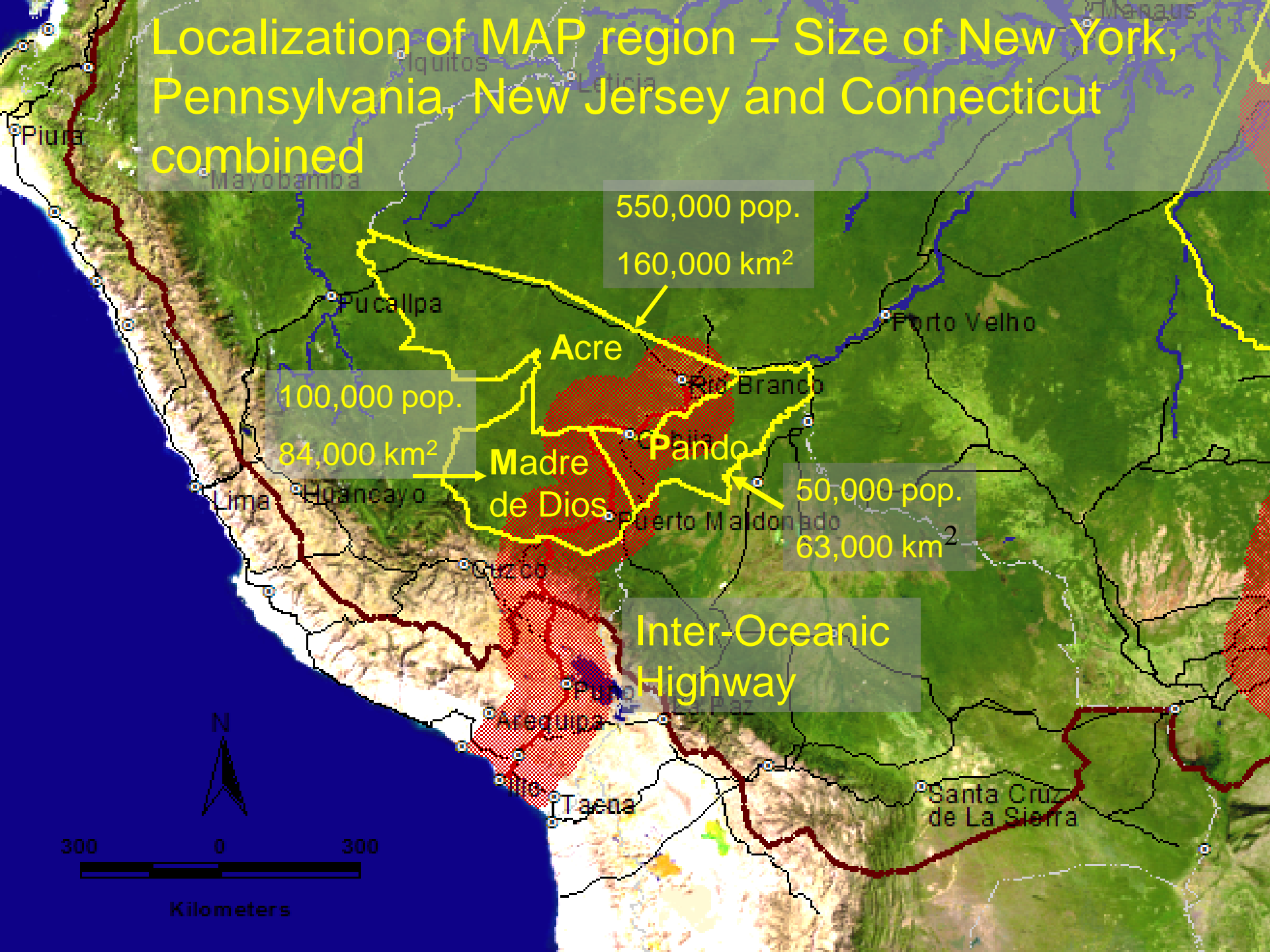
# Significant Results of LBA-MAP (Madre de Dios-Peru, Acre-Brazil, Pando, Bolivia)



Foster Brown

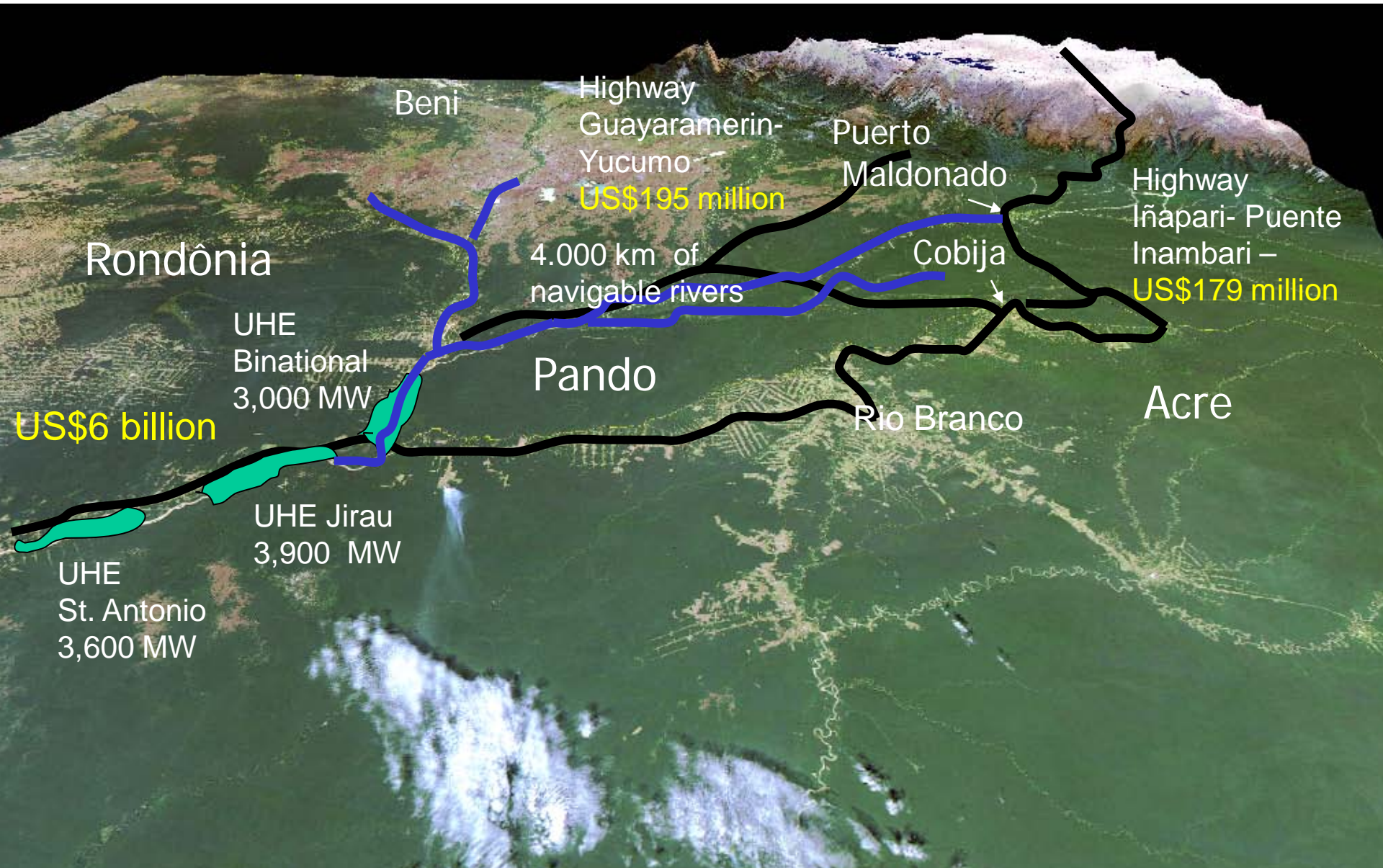
Woods Hole Research Center and Federal University of Acre  
LCLUC Science Team Meeting, UMCC  
20 January 2004, [fbrown@whrc.org](mailto:fbrown@whrc.org)

# Localization of MAP region – Size of New York, Pennsylvania, New Jersey and Connecticut combined



# ACCELERATING DRIVERS: Proposed infrastructure for southwestern Amazonia

View to the south of Brazil, Peru, and Bolivia. Product of NASA – M.Steining, CI





# One basic challenge faced by ESE, LCLUC, LBA, CCSP, and other initiatives

- How may LCLUC research affect societal decisions over the next 5 to 50 years?
- Principle 10 of the Rio Declaration on Development and Environment:  
*“Environmental issues are best handled with participation of all concerned citizens... each individual shall have appropriate **access to information** ...and the **opportunity to participate** in decision-making processes...”*
- LCLUC research can strengthen two basic human rights necessary for democratic decisions: *The Right to Know and the Right to Participate.*
- Presentation of results and their impact on regional societies.

## Deforestation estimates

- “Government of the Forest” in Acre State, model for the Amazon.
- Acre received Inter-American Development Bank Loan of 100 million dollars, needs to reduce deforestation rate.
- Major national magazine, *Veja*, uses INPE deforestation data to denounce increased rate of deforestation in Acre.
- INPE retracts data used for 2001-2002 rate for Acre. Implications for estimates of entire Brazilian Amazon.
- Question of data accuracy now being followed by national media.

“Acre, a Champion of Deforestation” 1208

Veja 24set03

Governor  
of Acre

Medição do  
desmatamento no  
Acre, em quilômetros  
quadrados, no ano  
passado e no ano  
anterior ao início da  
gestão de Jorge Viana

536

1208

### Significant results - Deforestation:

LBA-MAP participated in Ecological-Economic Zoning of Acre - deforestation estimates (Sassagawa and Brown 2000) and invited to participate in second phase of Zoning –2004, involving accuracy of deforestation estimates.

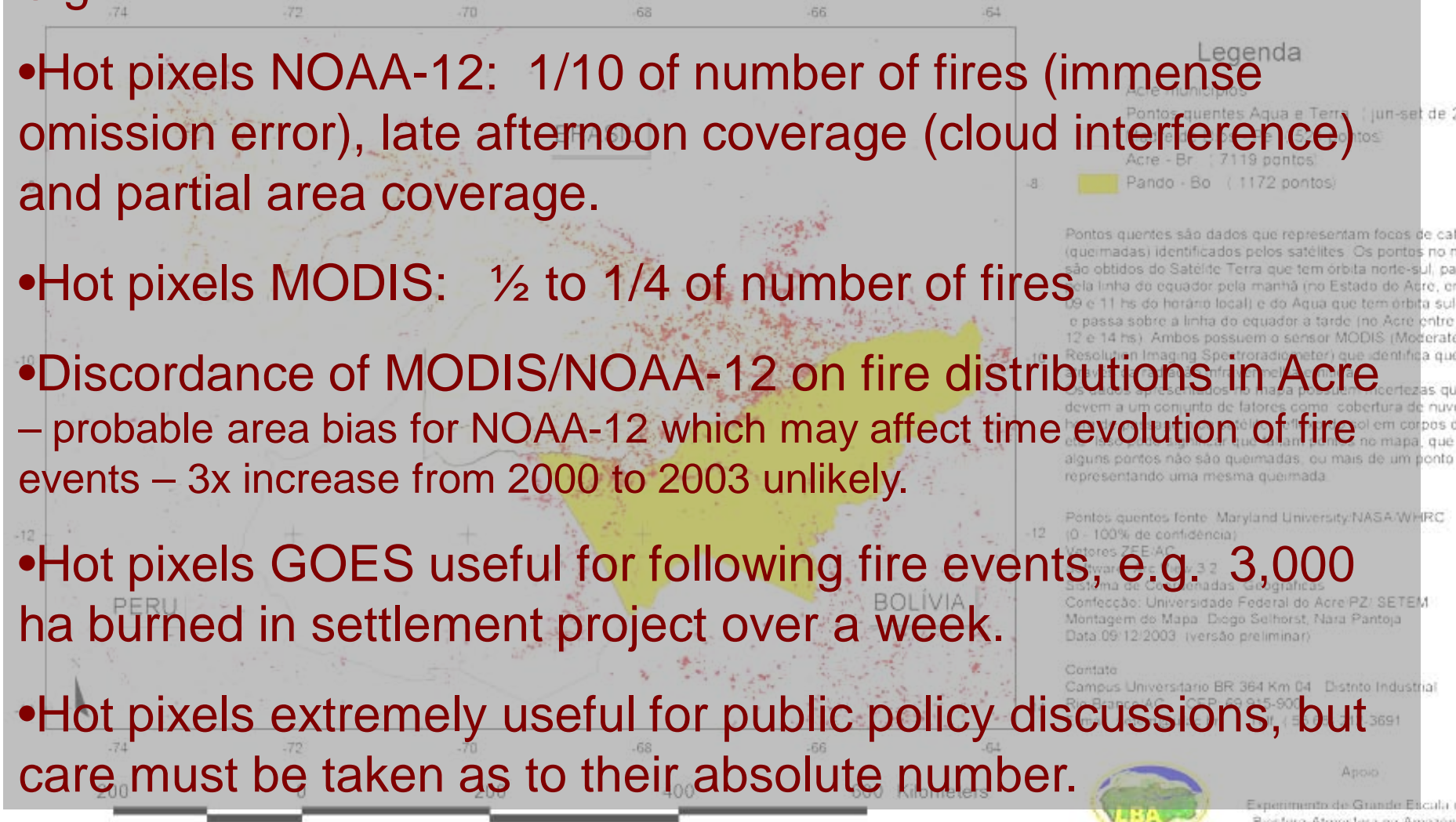
Series of popular articles in August on reliability of deforestation estimates - Brown (2003,I,II,III)



## Pontos quentes dos Satélites Aqua e Terra (MODIS) na região MAP - junho a setembro de 2003

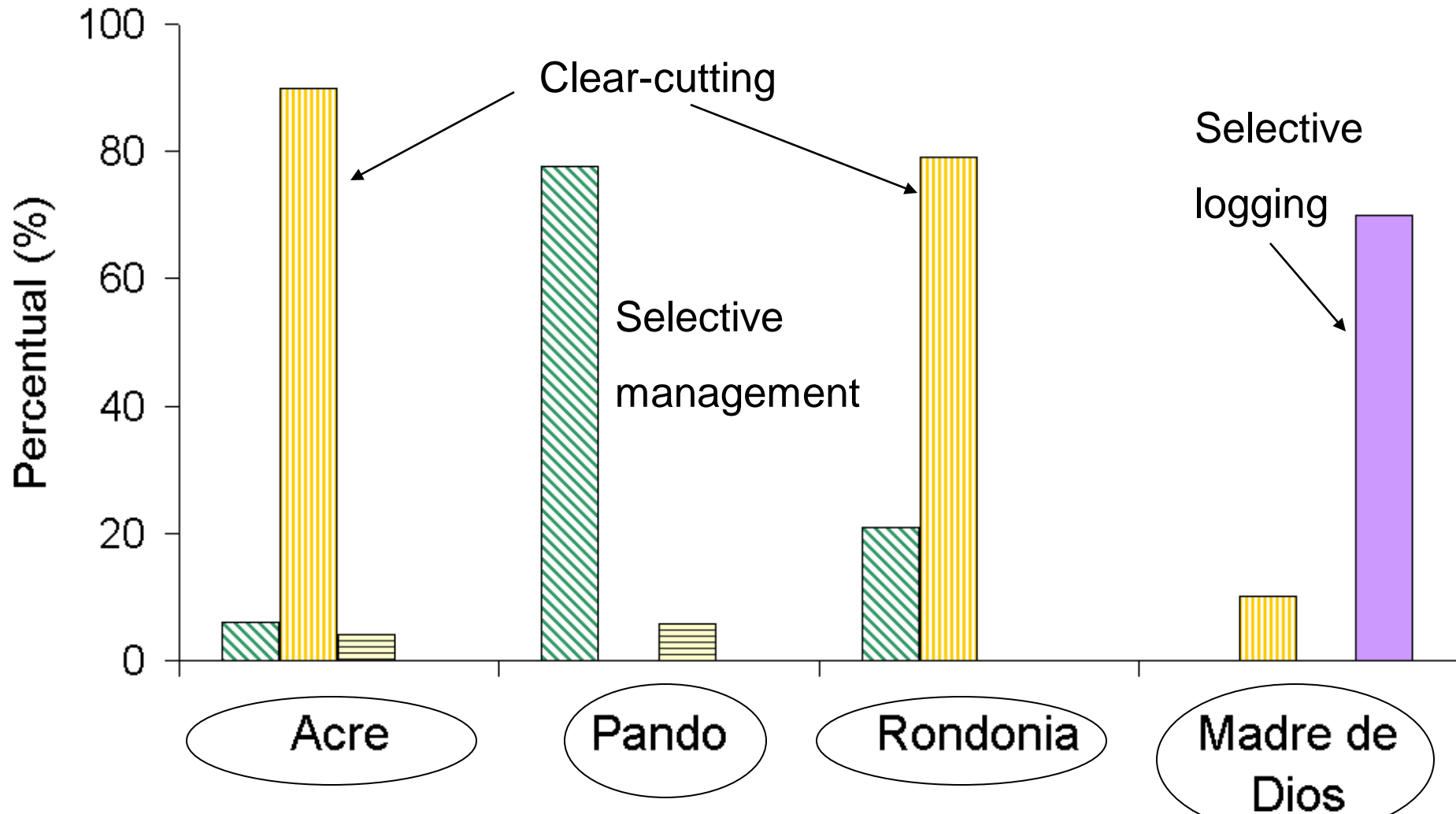
### Significant results -Biomass Fires:

- Hot pixels NOAA-12: 1/10 of number of fires (immense omission error), late afternoon coverage (cloud interference) and partial area coverage.
- Hot pixels MODIS:  $\frac{1}{2}$  to  $\frac{1}{4}$  of number of fires
- Discordance of MODIS/NOAA-12 on fire distributions in Acre – probable area bias for NOAA-12 which may affect time evolution of fire events – 3x increase from 2000 to 2003 unlikely.
- Hot pixels GOES useful for following fire events, e.g. 3,000 ha burned in settlement project over a week.
- Hot pixels extremely useful for public policy discussions, but care must be taken as to their absolute number.



## Significant results - Origin of Timber in MAP Region in 2002.

Note the stark differences.



Estimates from enforcement agencies and loggers: 70% of timber is extracted illegally. Information used to bring enforcement agencies of three countries together (Mendoza et al. 2003).



# Significant results – Education I

- *8 Masters completed by persons associated with LBA-MAP (75% graduated from the local university - UFAC). 1 exported to Clark University for Ph.D. program.*
- *6 Masters students (66% graduated from UFAC), 3 at the University of Florida*
- *2 Doctorates completed. Both at CENA-USP*
- *3 Doctoral students (66% graduated from UFAC). 2 doctoral students from Indiana U. and Clark U. now associated.*
- *19 individuals finished or are in graduate programs – 58% graduated from UFAC, 63% Brazilian, 16% Peruvian, 21% other.*
- *In 2003: 20 presentations in four countries to over 2,000 persons, including ambassadors, congresspersons, rural laborers, teachers, and local government officials.*



# Universidade da Floresta do Alto Juruá

## Significant results – Education II

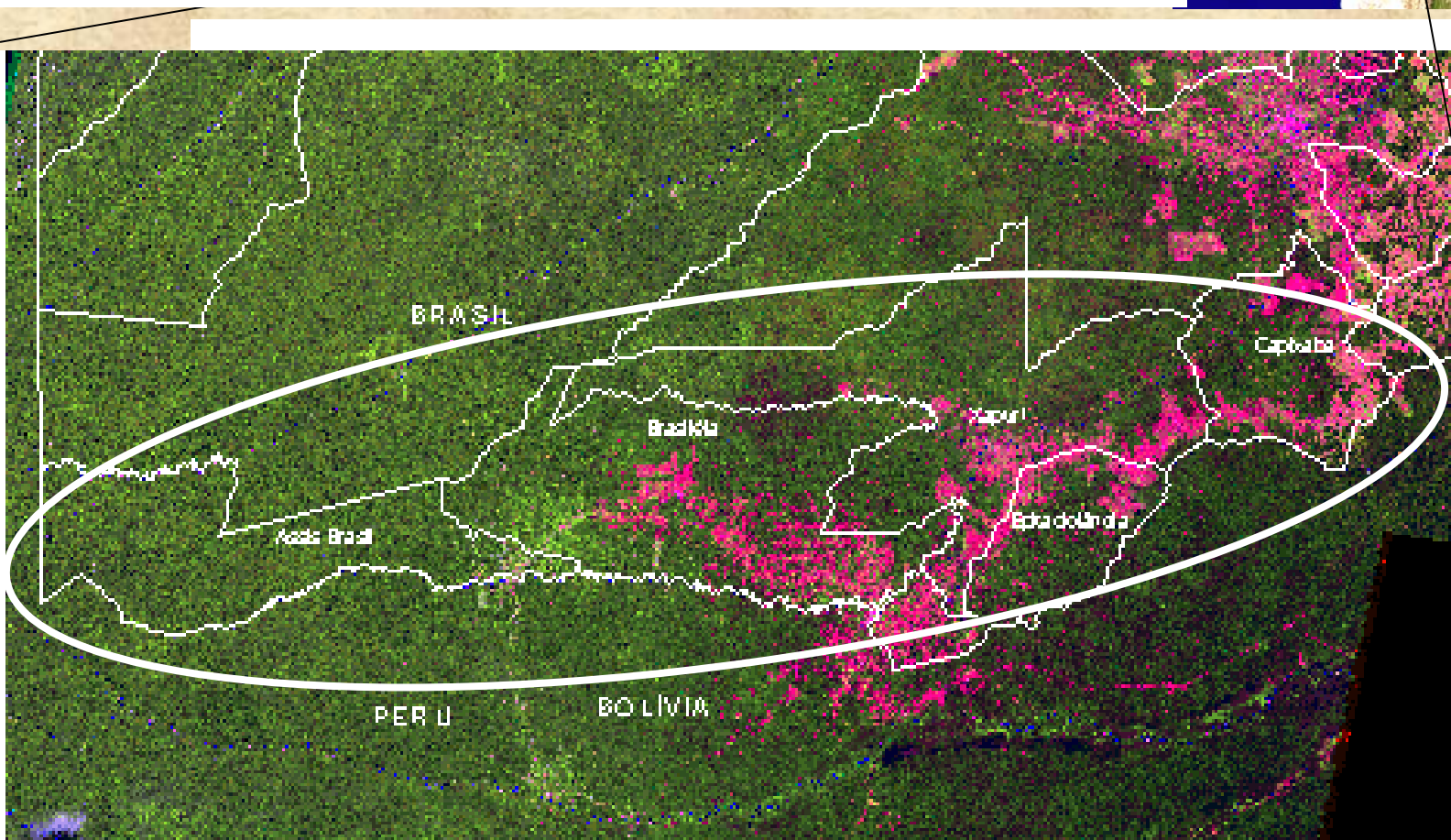
1. **University of the Forest**, a new model for higher education incorporating state-of-the-art research (part LBA) with traditional knowledge. 20 million dollars solicited in 2004 budget. Brazilian lawmakers solicited LBA contribution.
2. LBA research base for a joint 6-university (USP, UFV, FIOCRUZ, INPA, UFMG, UFAC) proposal to improve the **graduate program on natural resource management** at UFAC. 200,000-dollar proposal to Ministry of Science and Technology.
3. Trinational proposal for strengthening **basic education** (40% of the regional population involved) by including LBA research results in curricula of Brazil, Bolivia and Peru. Pilot program for 130 professors and 3,000 students.

# Significant results – Public Policy I: To Know and To Participate - MAP IV, Aug-03

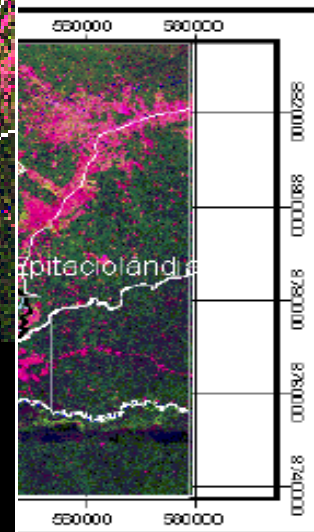
- More than 600 participants, 160 institutions.
- Statement of Brasileia-Epitaciolândia on Collaboration for Sustainable Development of the MAP Region in Portuguese, Spanish and English. [www.ac.gov.br](http://www.ac.gov.br) forum.
- Recommendations: **Environmental Conservation, Social Equity, Economic Development, Public Policy** - 18 pages.
- Proposals: 17, many with the goal of **altering LCLUC trajectories**.



**Significant results – Public Policy II.**  
Consortium of Upper Acre and Capixaba  
(CONDIAC) asked LBA-MAP to help  
prepare regional land-use plan for 15,000  
km<sup>2</sup> and 50.000 residents along Bolivian  
and Peruvian borders.



Upper Acre River  
TM data





# Peruvian congressional representatives solicited presentation of MAP IV results in Lima, Peru



LBA-LCLUC researchers

Guillermo Rioja,  
Bolivian,  
social  
anthropologist

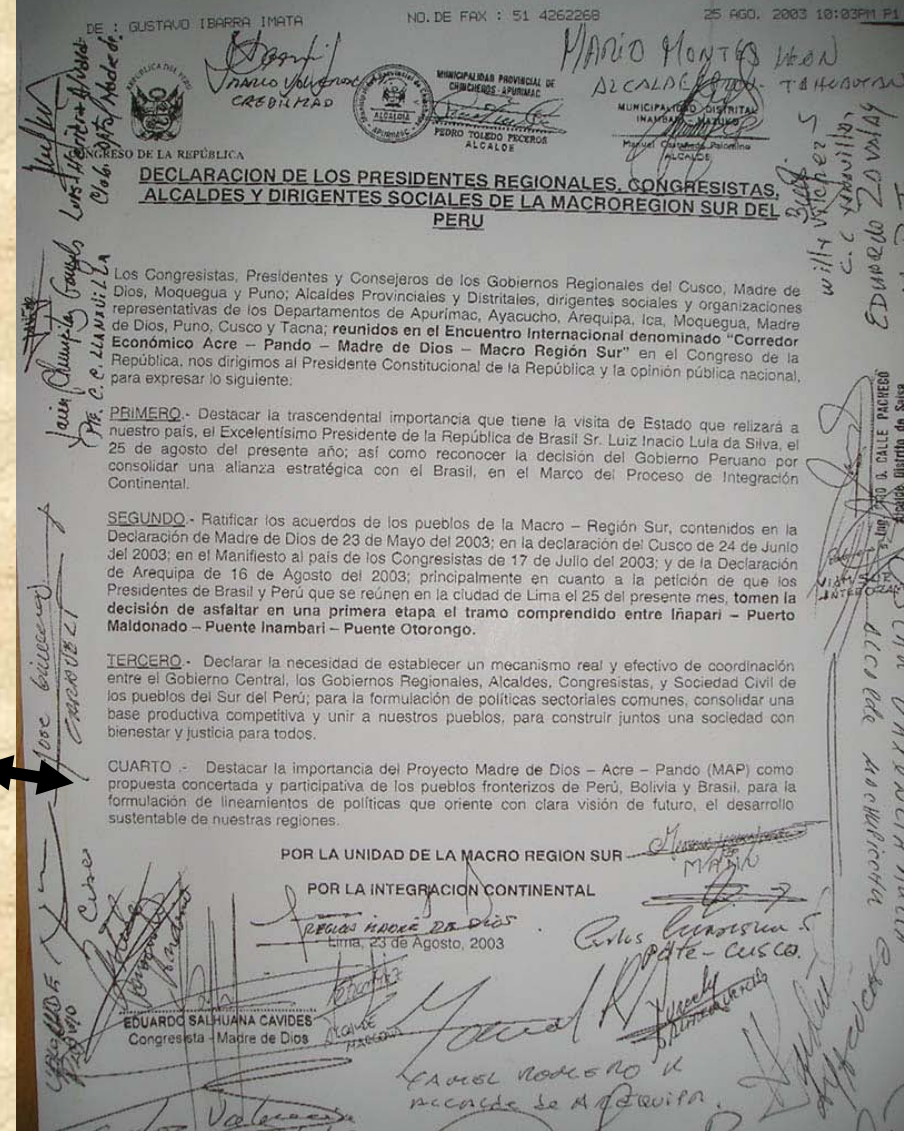
Leila Galvao,  
Brazilian,  
Vice-Mayor of  
Brasileia

Elsa  
Mendoza,  
Peruvian,  
Forester

Foster Brown,  
American,  
environmental  
scientist

# Declaration of the Regional Presidents, Representatives and Mayors of the South Macro-Region of Peru (9 million pop.), 23 August 2003

“Fourth – Emphasize the importance of the Madre de Dios-Acre-Pando (MAP) Project as a participatory and unifying proposition of the frontier peoples of Peru, Bolivia and Brazil for the formulation of policies that guide, with a clear vision of the future, the sustainable development of our regions.”



Impact of LBA-LCLUC research beyond target area.