UNITED NATIONS / UNITED STATES OF AMERICA INTERNATIONAL MEETING ON THE USE AND APPLICATIONS OF GLOBAL NAVEGATION SATELLITE SYSTEMS

Vienna

December 13 to 17, 2004

Update on the state of the art of the use of GNSS on agriculture and natural resources management

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University of São Paulo

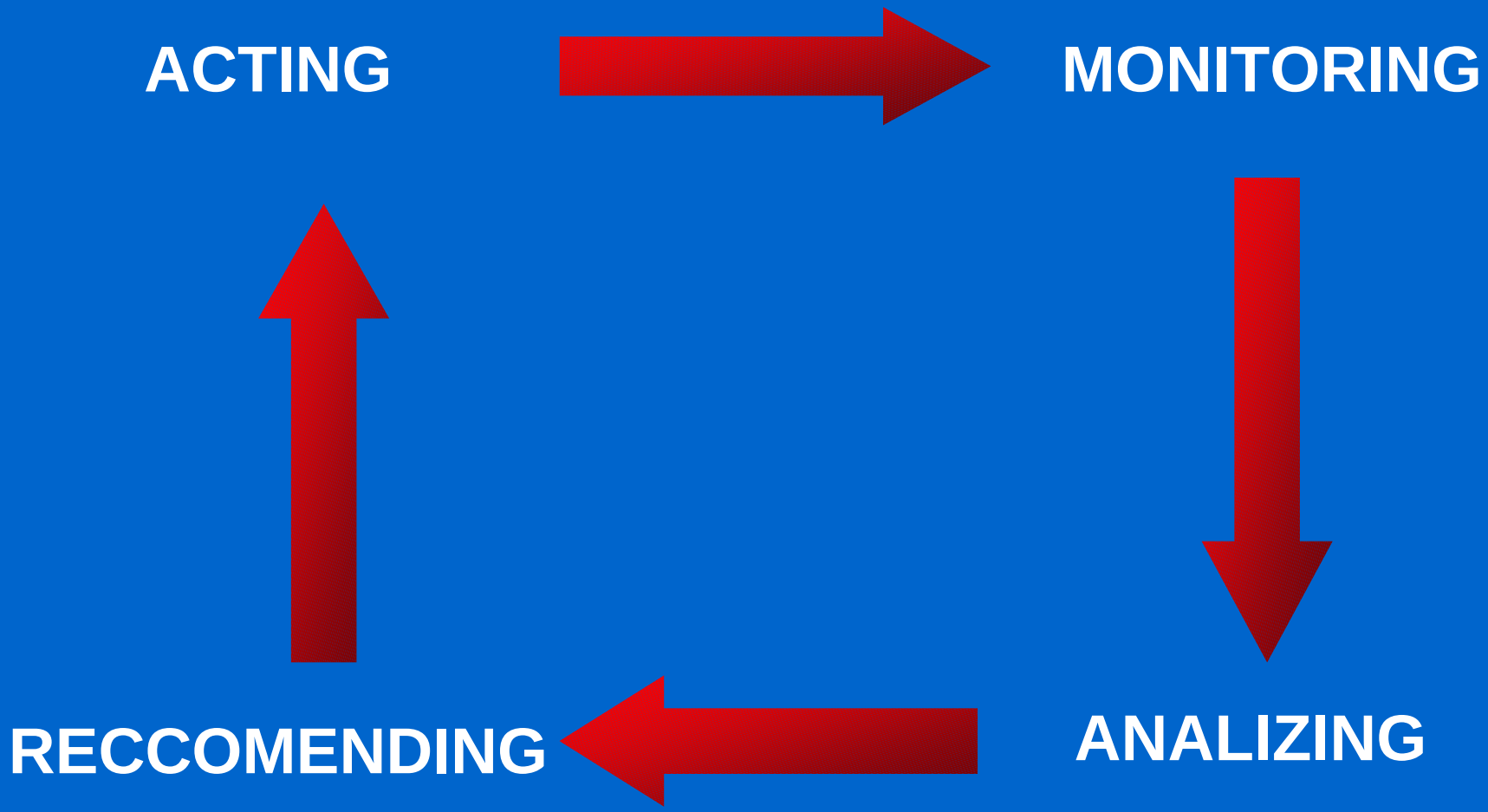
Just to remind you:

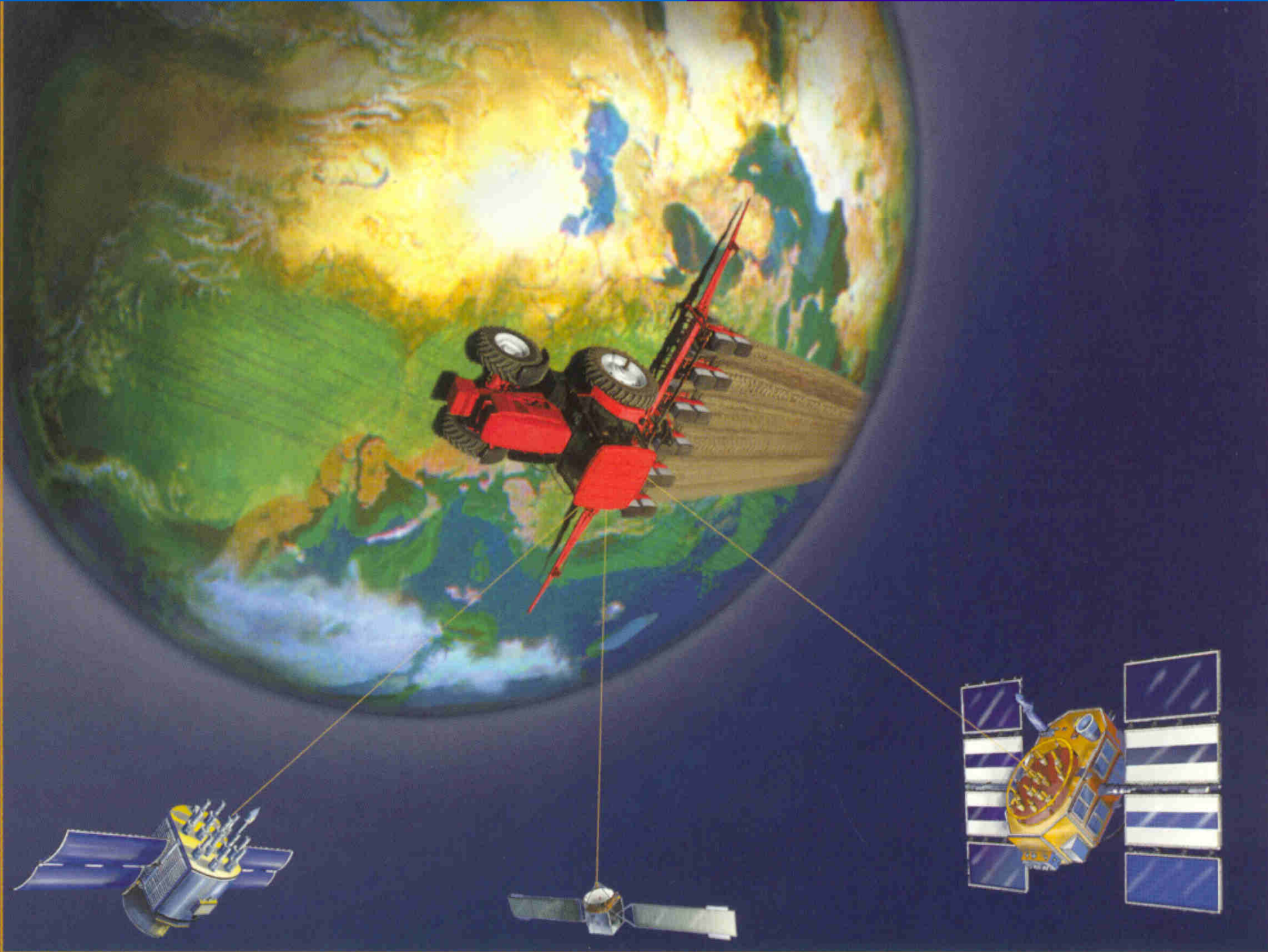
we are mainly users and not experts of GNSS

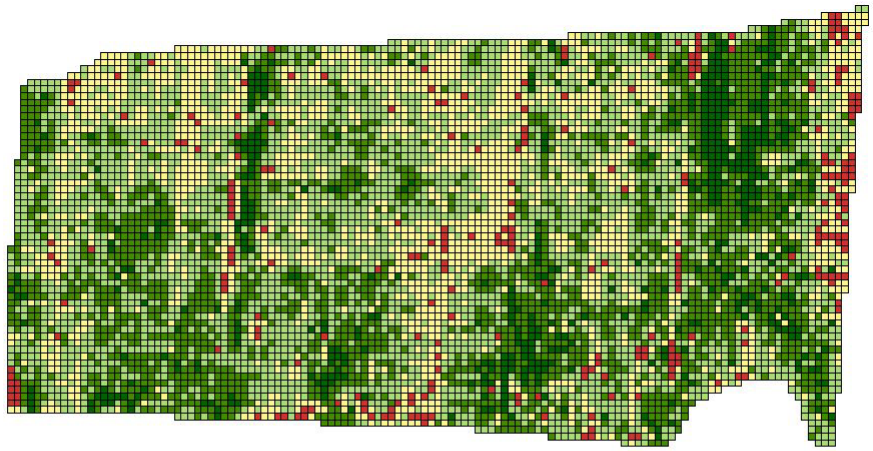
Natural resources management

- Water
- Forestry
- Wildlife

Precision Agriculture


ACTING
MONITORING
ANALIZING
RECCOMENDING

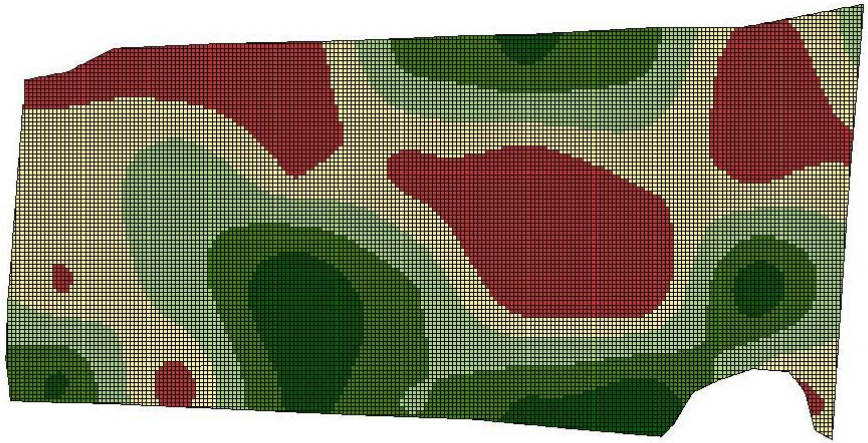




Corn, 2004

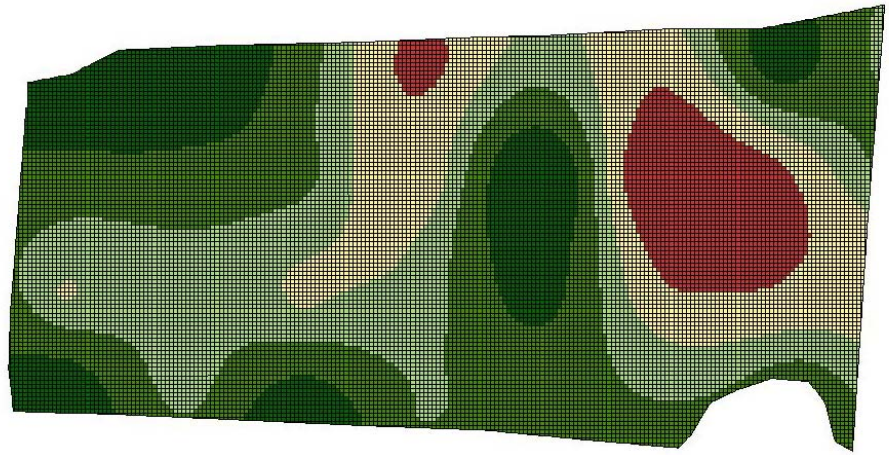
2101 - 6124 kg/ha
6124 - 6757 kg/ha
6757 - 7205 kg/ha
7205 - 7748 kg/ha
7748 - 9373 kg/ha

100 0 100 Meters



K

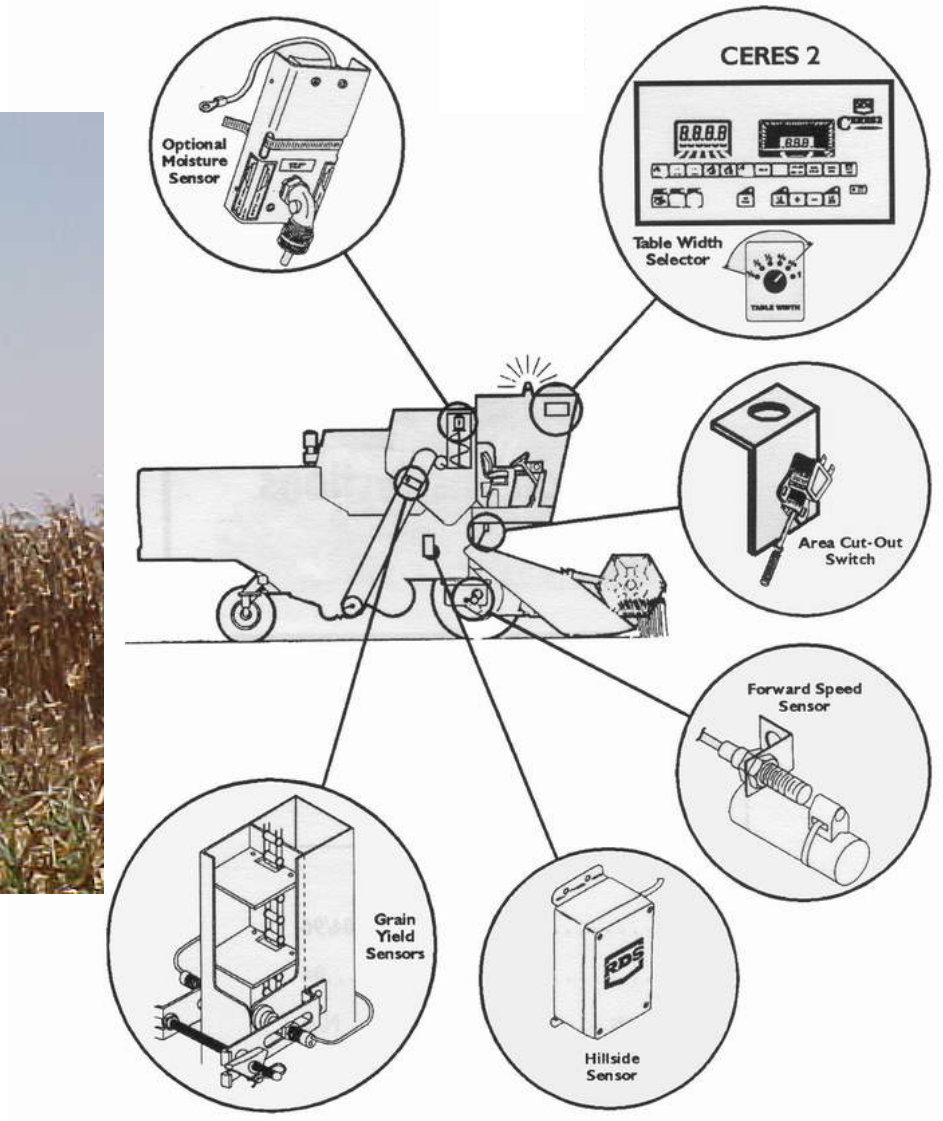
1.0 - 1.6
1.6 - 2.0
2.0 - 2.5
2.5 - 3.0
3.0 - 3.8



P

6.2 - 23.8
23.8 - 32.6
32.6 - 39.7
39.7 - 48.9
48.9 - 68.6

Precision Agriculture Ideas



SSToolbox 3.1 - [Field: Lúcio M; 99] - Farm: FABC - Client: Fabc

SSTools Input/Convert Plan Analysis Management Chart/Maps Edit View Theme Graphics Window Help

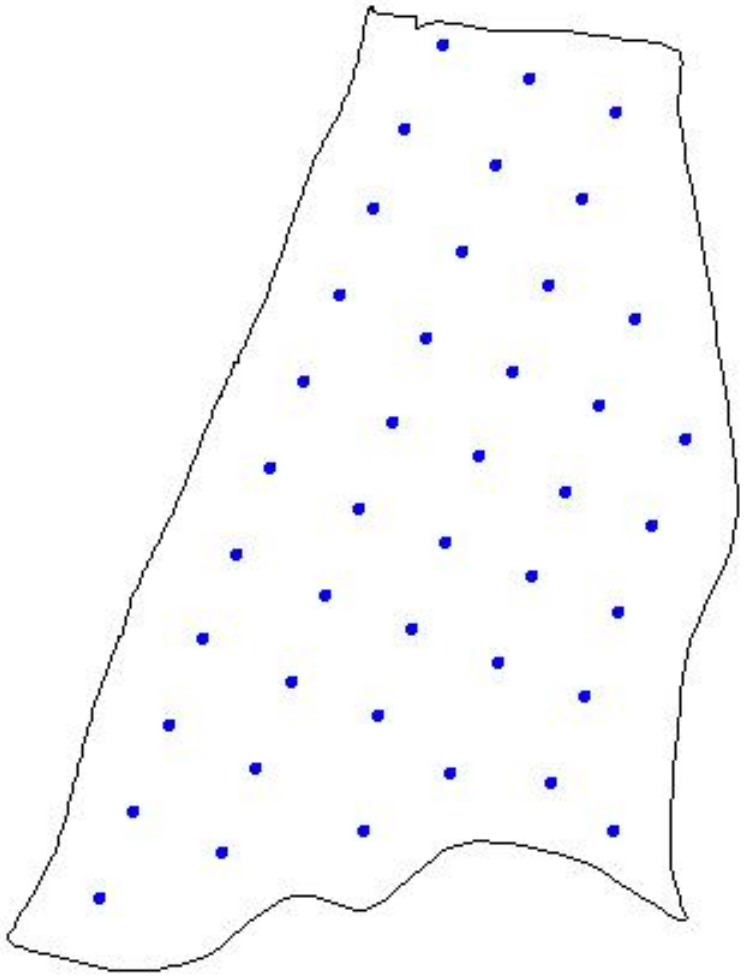
Scale 1: 6,913

587,329.23
-2,692,447.05

Lúcio M; 99

Pontos Amostrados

Field Boundary

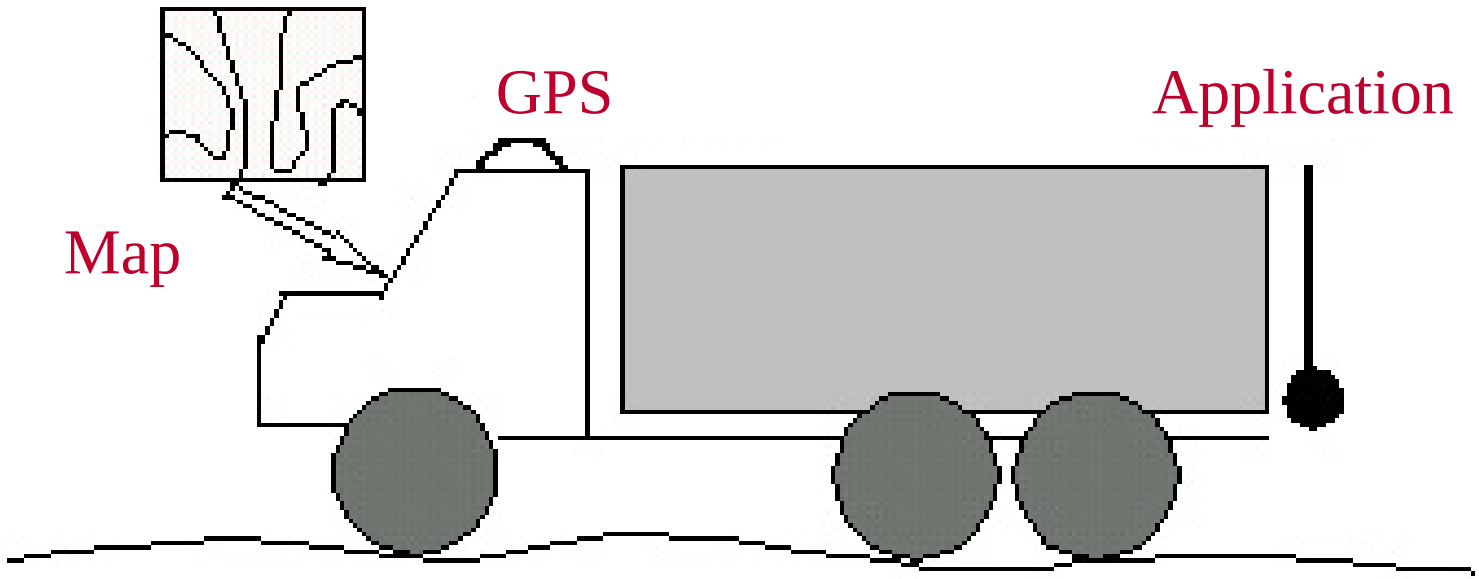


Iniciar SSTool...

09:54

Precision Agriculture Ideas

Precision Agriculture Ideas



GNSS in Agriculture

GNSS in Agriculture

Light bars for parallel swathing


OUTBACK S
NO SIGNAL
GPS
DGPS
STEERING GUIDE™
OutbackGuidance.com
1-800-247-3808
Patents Pending
CURRENT POSITION
ENTER
MENU
Ready - 8 Sats
6.34 hrs Memory
CONTOUR GUIDANCE
STRAIGHT GUIDANCE
A B

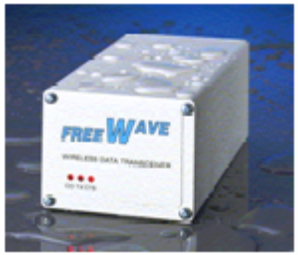

CULTIVA
Marker LTi
R 3
0.0
4.5
NORMAL OPERATION
ERASE NEW STAKE EXIT

Auto guidance

Auto guidance

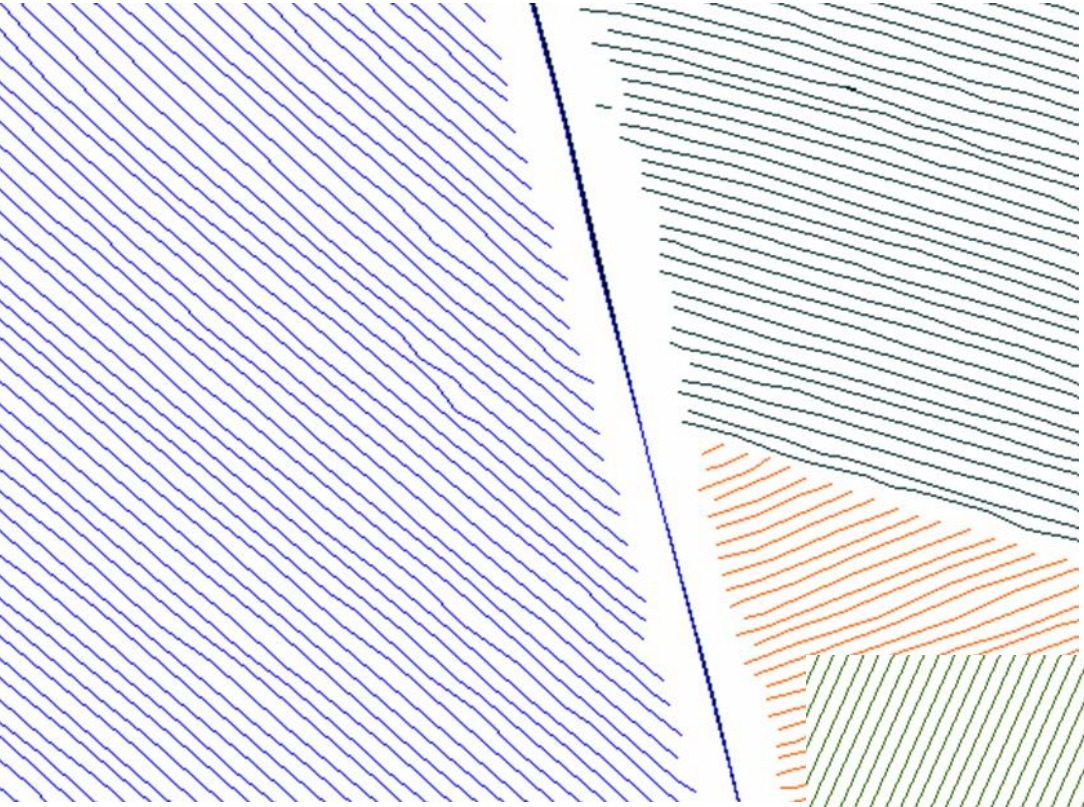
GPS and gyroscopic

Control on hand and display

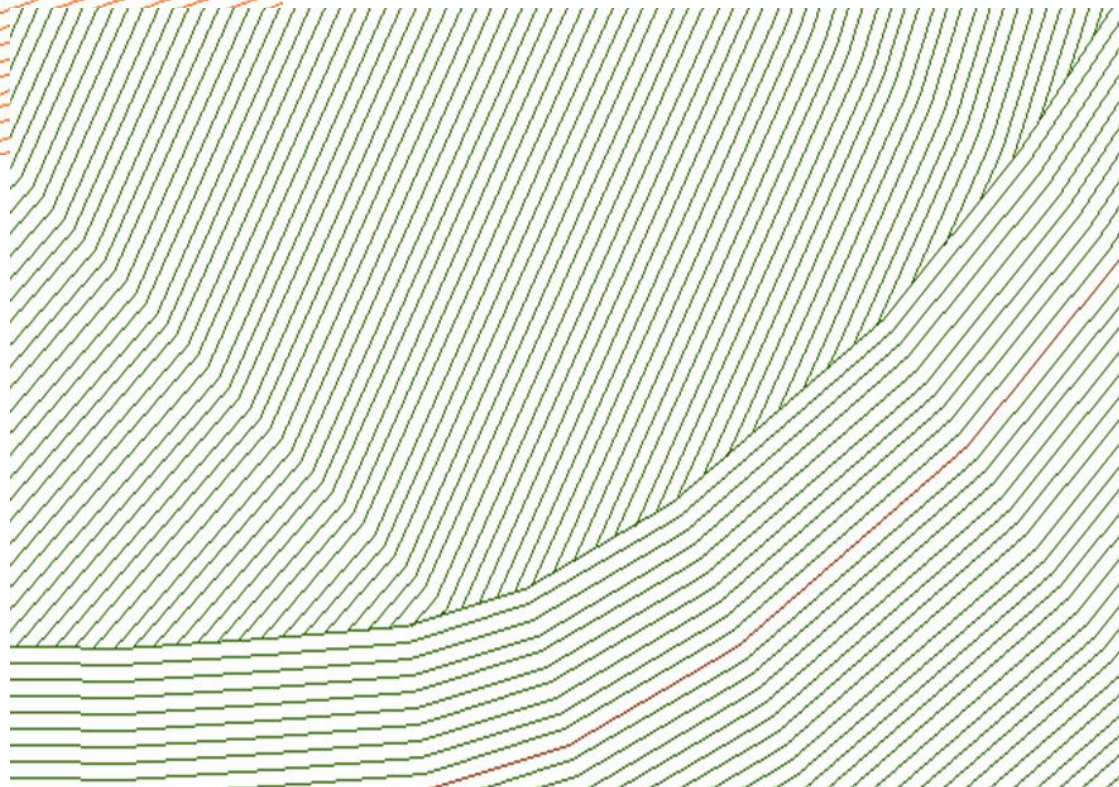


Radio for differential correction with base station

Base station for differential correction



Field Tests –
Trimble/S&C/GVO/Valtra



Mapping on sugar cane rows

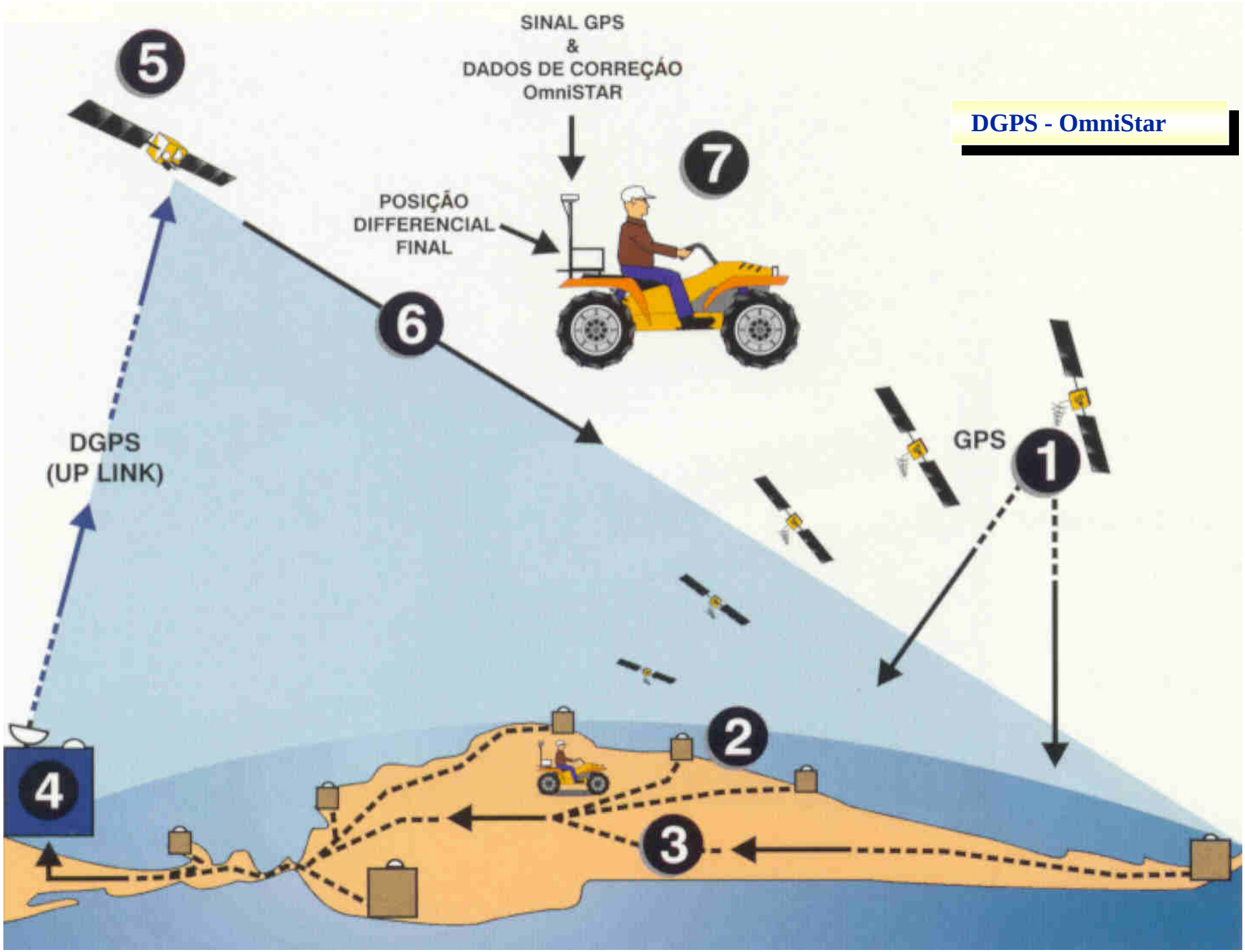
Major concerns

- Lack of information to users and potential users
  - Few users
  - Misusing available technology
- Few expertise available
- High cost
  - equipment
  - access
  - training
- Availability of augmentation signals

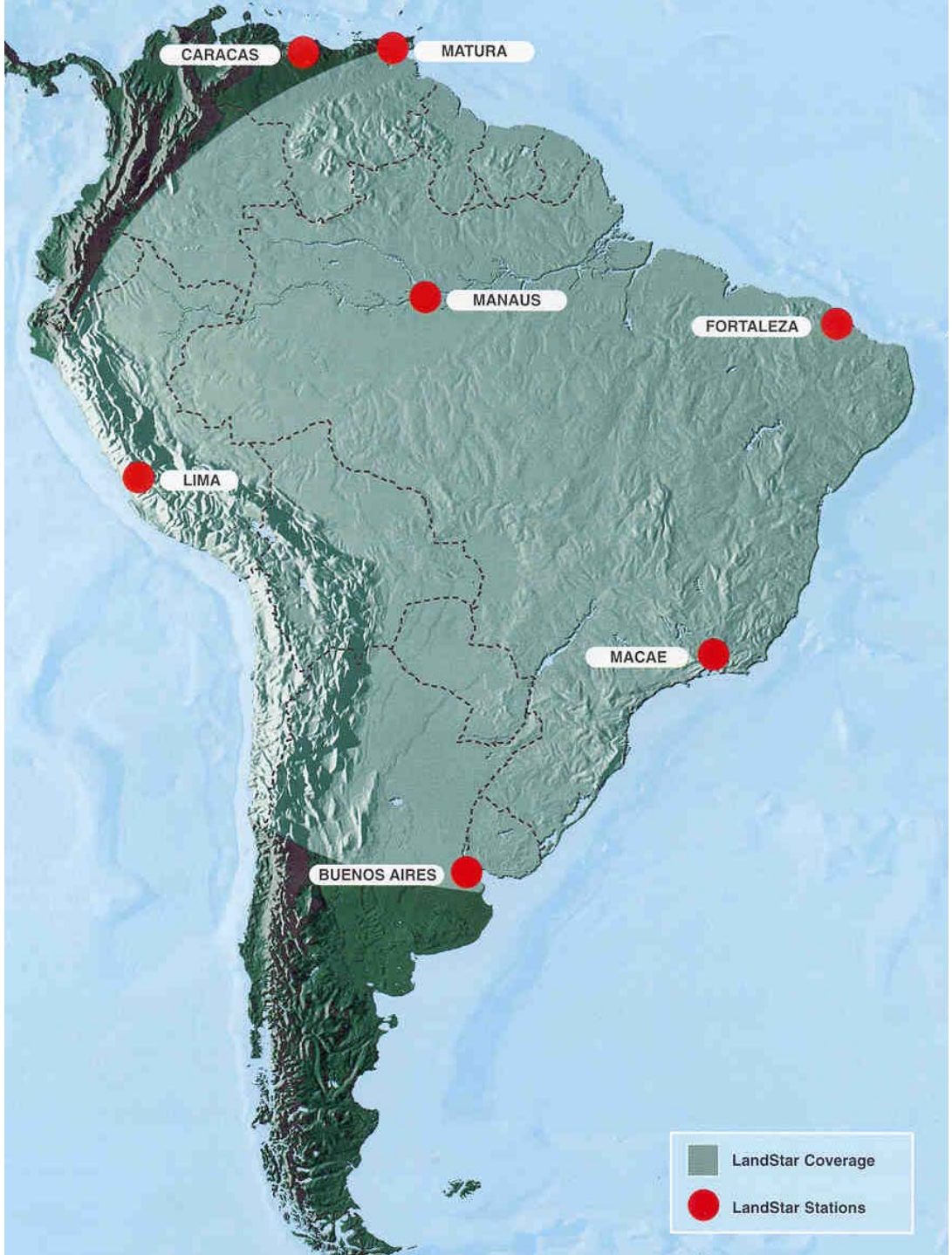
Differential Correction

- Post processing
- Radio on local towers
- Satellite
- Regional broadcasting UHF
- Internal algorithms on receivers (filters)

DGPS - OmniStar



DGPS - RACAL

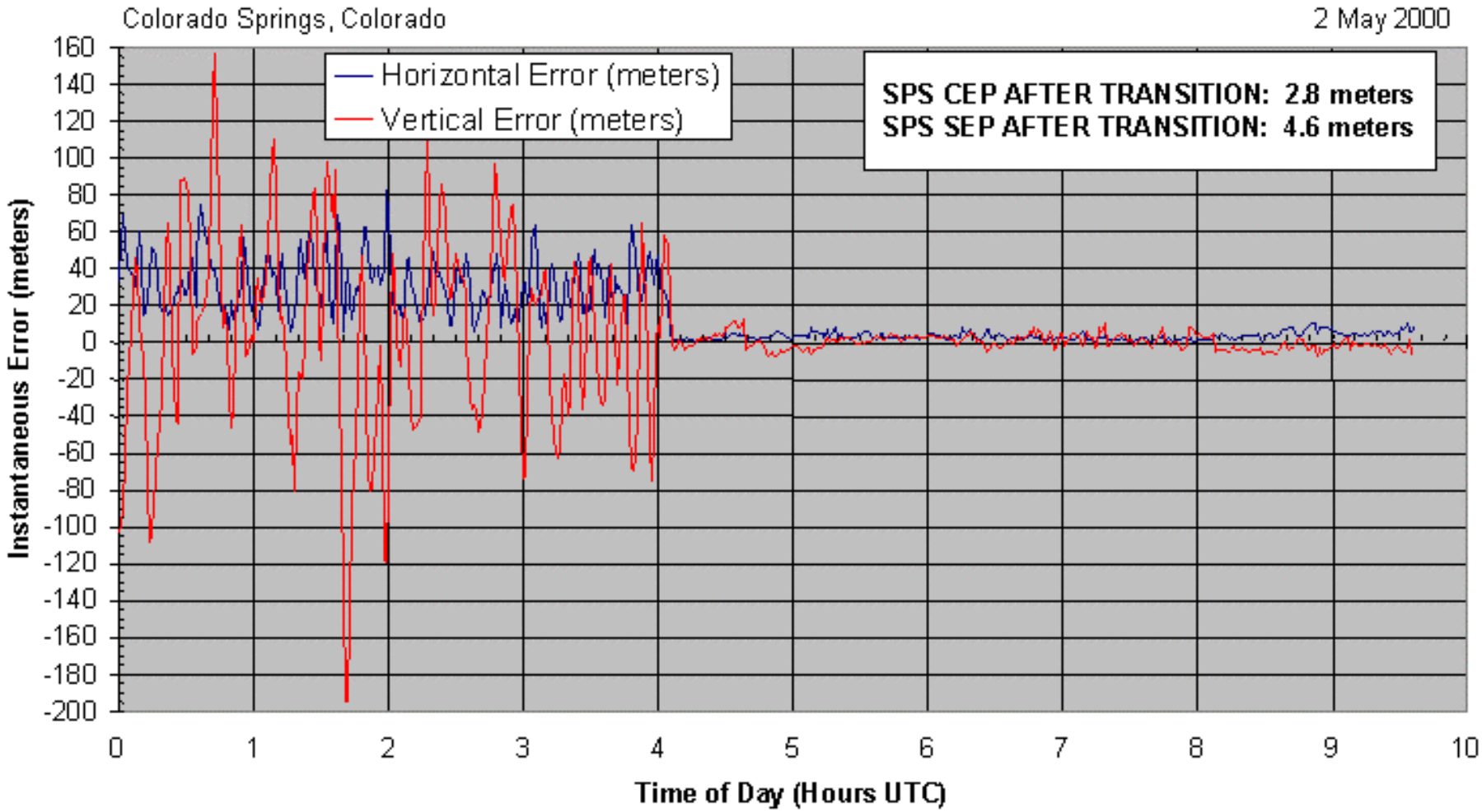

CARACAS
MATURA
MANAUS
FORTALEZA
LIMA
MACAE
BUENOS AIRES
LandStar Coverage
LandStar Stations

Accuracy for PA

- Row seeding - 0,1m
- Spraying (light bar) - 0,1m
- Variable rate/herbicides - 1,0m
- Yield mapping - 10,0m
- Variable rate/fertilizers - 30,0m

STAFFORD(1996)

SA Transition -- 2 May 2000

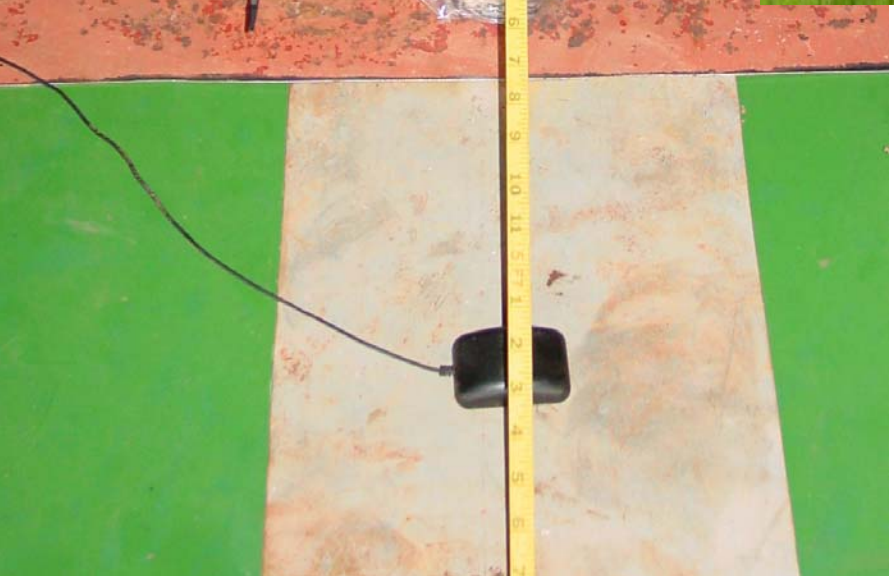



GPS III
plus
BRAZIL


COMPAQ
iPAQ
Pocket PC
SST Stratus
2:15p
Client
Map
Field Information
MultiPolySelect
GPS
File Zoom Measure Clear GPS

Some local actions with our involvement

- Brazilian Section of American Chamber of Commerce Workshop “Enhancing Productivity Using the Global Positioning System”, September 13, 2004
- First Brazilian Congress of Precision Agriculture, University of São Paulo, May 17 to 19, 2004
- Training Curse on Precision Agriculture (one week), University of São Paulo, one or two sections per year
- Training Curse on GNSS for Agricultural Applications (one day), University of São Paulo, several section per year.
- Research, testing and development of new applications




Para evitar lesões ou
RUN Tracking PAGE 3
Track No. 1-W
Error (m) 6.84
Steer OFF
Mark Point
JOHN DEERE
RUN 95633 PAGE 1
Range 1
Speed (kph)
Pressure (kpa)
Rate (l/ha)
Rate 1 50.0
Rate 2 70.0
Rate 3
A B C D E F G
1 2 3 4 5 6 7 8 9
PAGE SETUP INFO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TOSHIBA

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Thank you!

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PA Equipment in Brazil

- 100 yield monitors with GPS
- 1200 light bars for ground application
- 900 light bars for airplanes
- 30 VRT vehicles and equipments