Aportes da alta resolução SPOT para o monitoramento da cor da água

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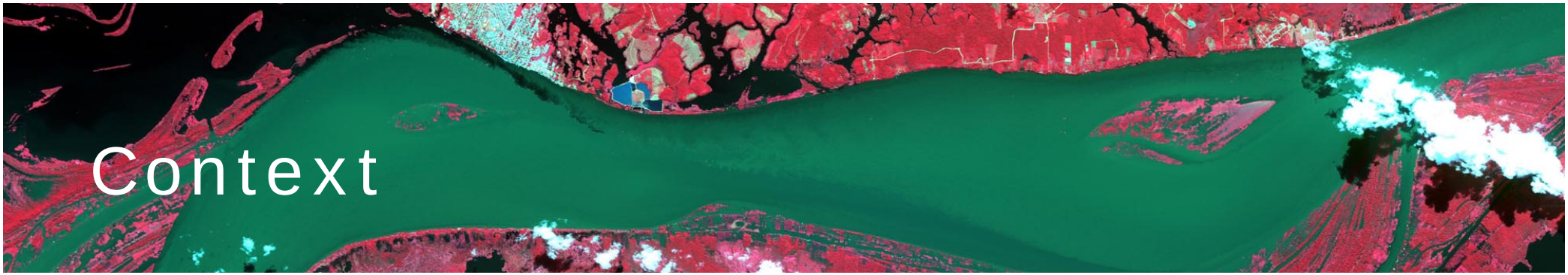
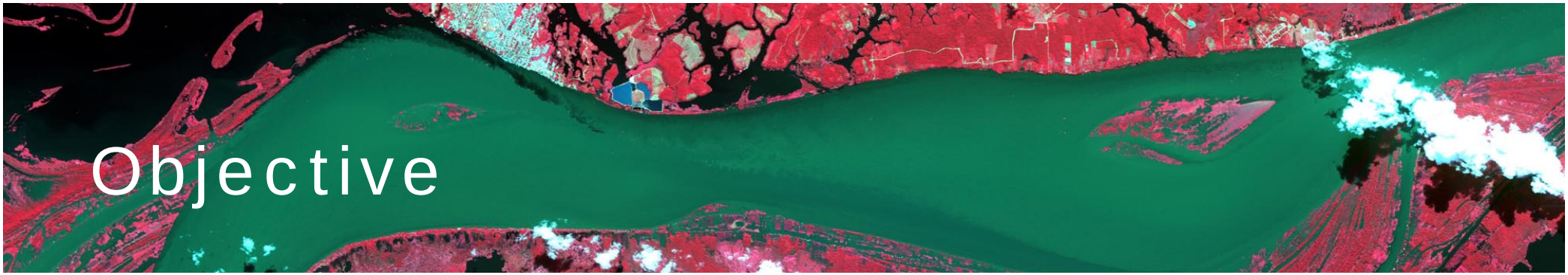


Context

- Medium resolution sensors allow to retrieve some water quality parameters in the Amazonian waters
  - ➔ Suspended Sediment concentration in rivers
  - ➔ Suspended Sediment in floodplains
  - ➔ Phytoplankton pigments in floodplain lakes

- The use of very high resolution sensors (< 10 m) is expected to bring complementary knowledge to MODIS & MERIS
  - ➔ Spatial resolution (5 meters vs 250 meters)
  - ➔ Temporal resolution (few images on selected areas vs 2 images per day at global scales)
  - ➔ Radiometric resolution (number of bands, bandwidth)



Objective

- PNTS (Programme National de Télédection Spatiale) project funded by INSU
  - ➔ *Apport de l'imagerie satellitaire pour le suivi du transport sédimentaire dans les grands fleuves : caractérisation de la précision de la mesure*
  - ➔ Proposing team : LMTG & US ESPACE (SEAS Guyane Project)

- Methodological project : Analyse the impact of river section properties (width, variability, river sides ...) on the accuracy of suspended sediment retrieval with MODIS
  - ➔ Joint analysis of SPOT images / field data and MODIS products

- Study the benefit of future satellite configurations
  - ➔ PLEIADES (CNES), Sentinel (ESA) future satellites

- SAMSAT project funded by French Spatial Agency CNES
  - ➔ Spectroradiometric measurements
  - ➔ Field campaigns
  - ➔ Inversion model

Project Schedule

- 2-year project

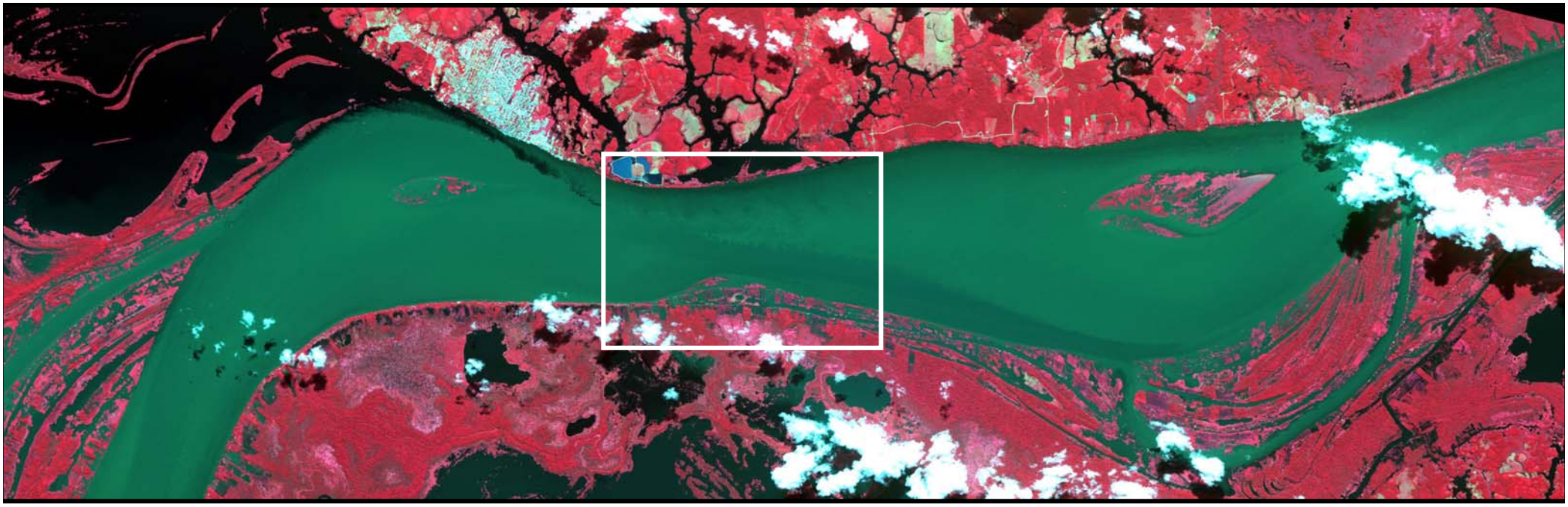
- 2007 :
  - ➔ Acquisition of SPOT images (SEAS Guyane) during field campaign (SAMSAT project)
  - ➔ 2 field campaigns (May, November)
  - ➔ Statistical analyses of field data

- 2008
  - ➔ More SPOT images on ORE stations
  - ➔ 1 field campaign (March)
  - ➔ Joint analysis of radiometric field measurements, water samples and SPOT & MODIS images in 2008

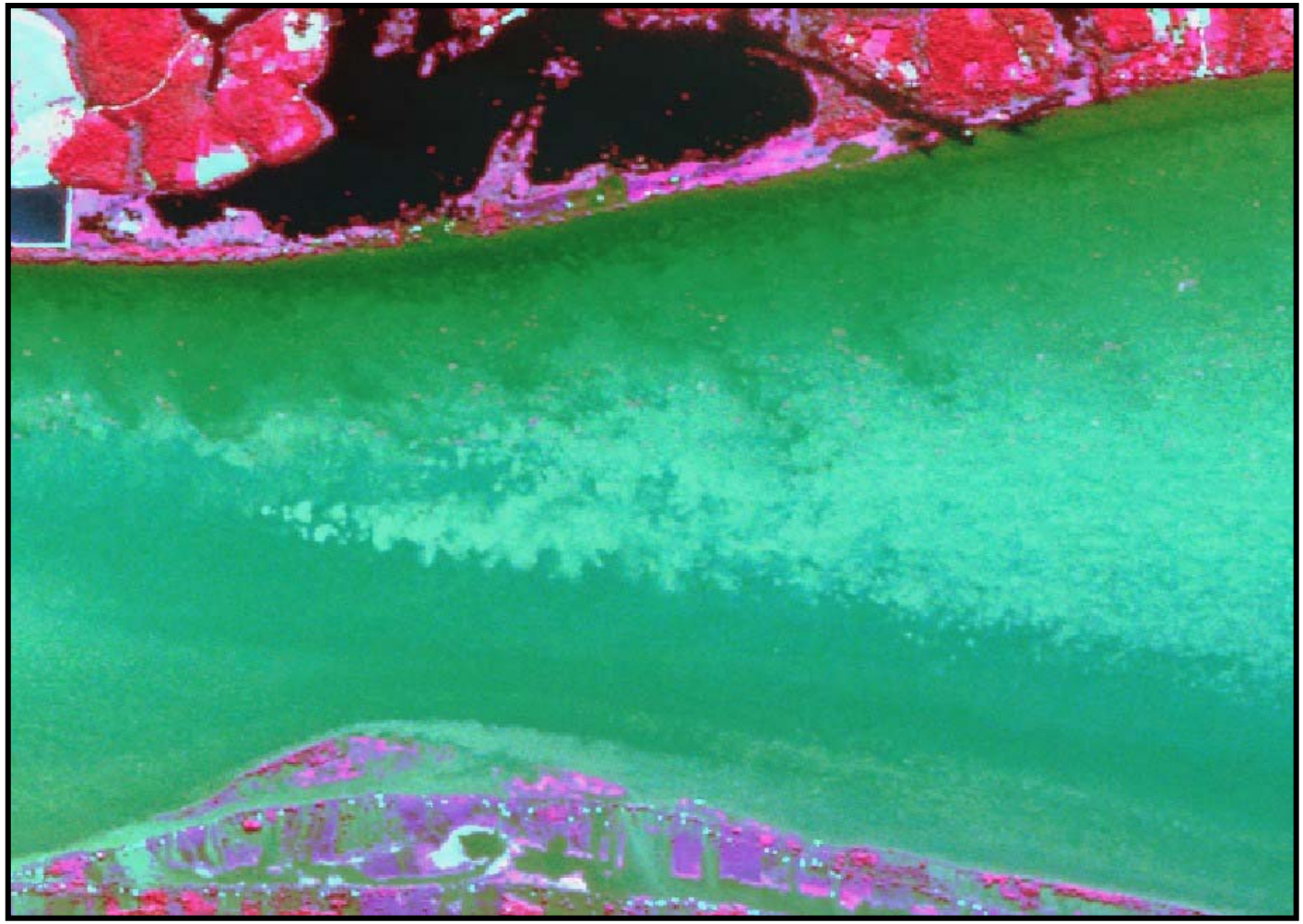
- Field campaigns for measurement of surface suspended sediment concentration variability
  - ➔ Specific sampling at Manacapuru and Borba stations
  - ➔ Spectroradiometric measurements

Very high resolution imagery

- SPOT 5 image over Manacapuru station



Very high resolution imagery

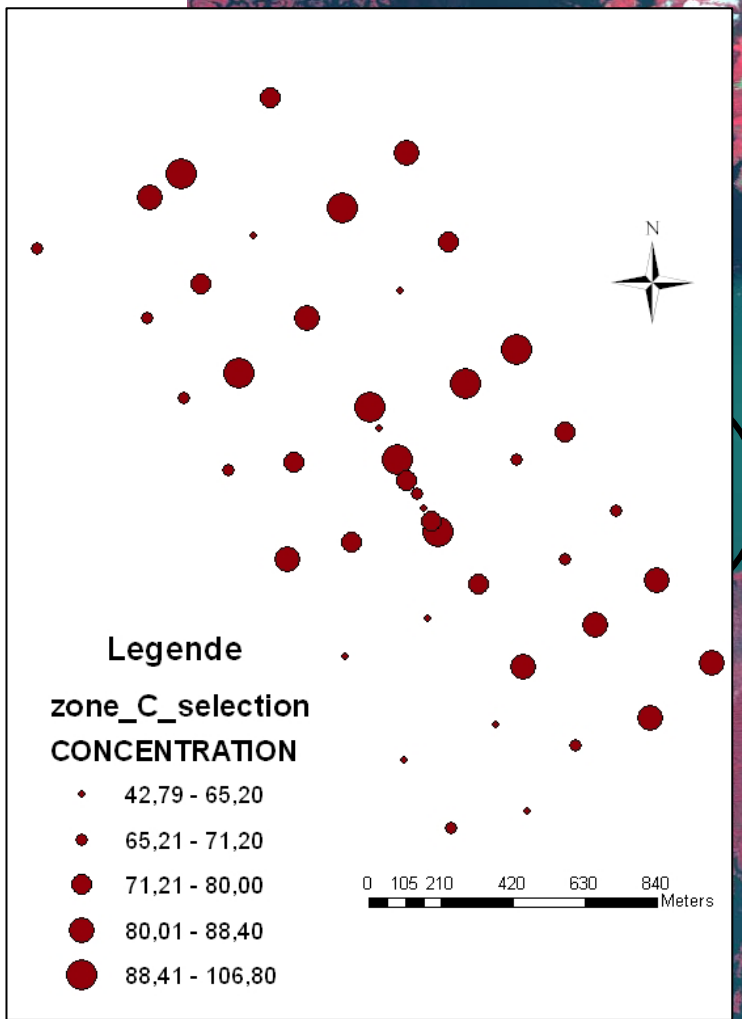


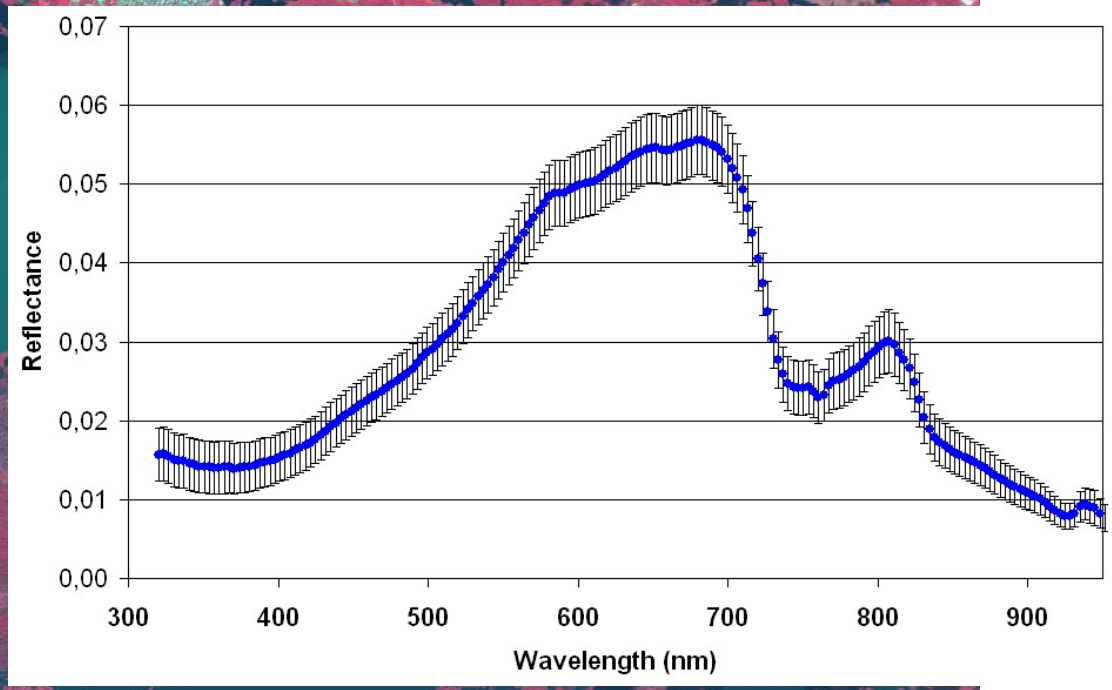
June 2006

Very high resolution imagery

June 2007

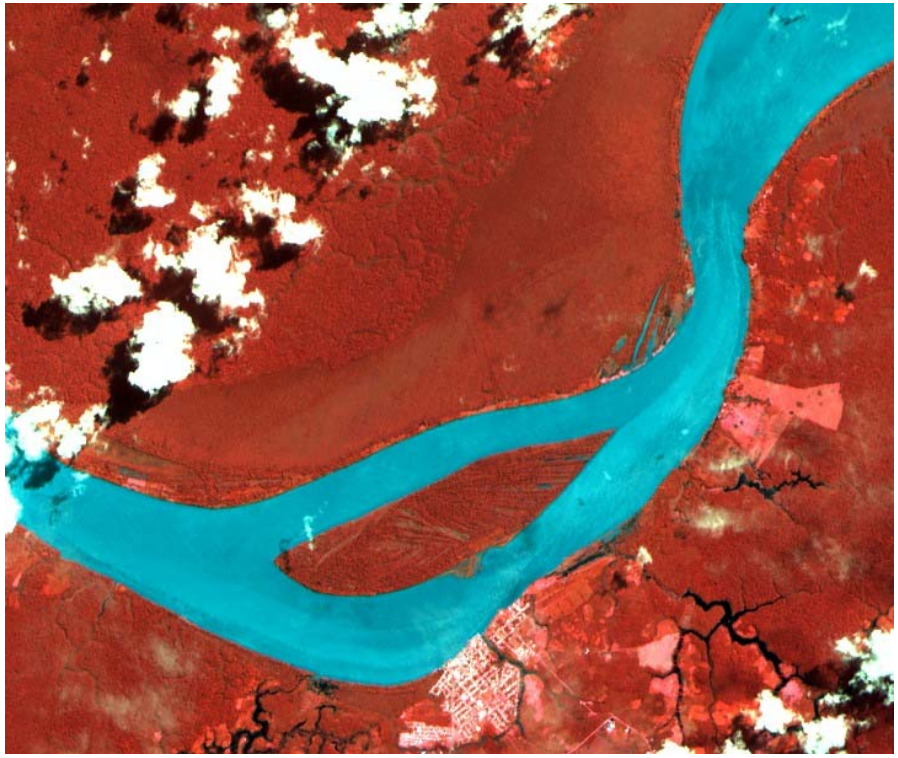
Water Sampling





Very high resolution imagery

- SPOT image over Borba station



Very high resolution imagery

- SPOT image over Borba station

Conclusion / Perspectives

- First results confirm that very high resolution imagery brings important knowledge on local properties of river sections
  - ➔ Fine caracterization of surface properties
  - ➔ Complementarity with coarser resolution sensors

- Systematic study over ORE stations ?

- Perspectives
  - ➔ Systematic statistical analyses
  - ➔ Guidelines about the use of MODIS images
  - ➔ Inputs for other projects / rivers
    - ❑ MESASOL, PIATAM, PROSUL
    - ❑ CYMENT, SAMSAT

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