

**Dynamic of CDOM in the South Pacific: an application of ocean color remote sensing.**

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1. Introduction | 2. Aims | 3. Study area | 4. Methods used to study area | 5. Perspectives with Fiji

➤ **What is CDOM?** CDOM= Chromophoric Dissolved Organic Matter  
DOM= Dissolved Organic Matter

Chromophoric Dissolved Organic Matter: Part of DOM absorbing light in the ultraviolet and visible range of the light spectrum.

➤ **Why study CDOM?**

**Important ecologic and biogeochemical impacts**

- Protect marine organism against UV
- Control light availability for photosynthesis
- Key role in global carbon cycle for marine microorganisms
- Pollutant sources: anthropogenic activities

**Huge impact in tropical lagoon ( reduction of photosynthesis), but largely unknown**

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CDOM= Chromophoric Dissolved Organic Matter

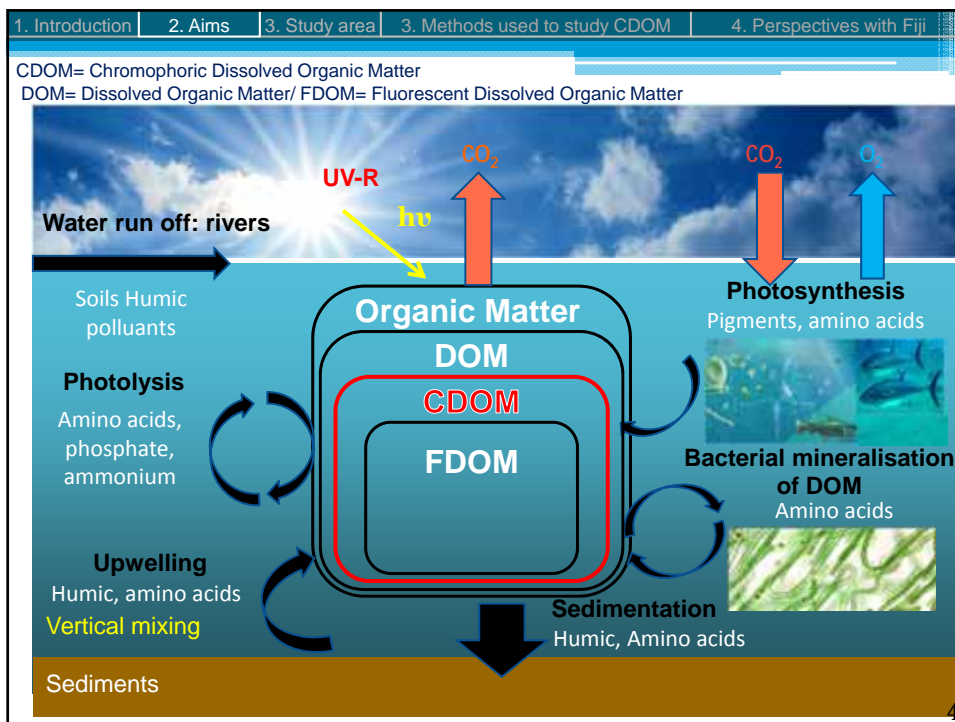
➤ Spatio-temporal variability of CDOM along a continuum coast-lagoon-offshore

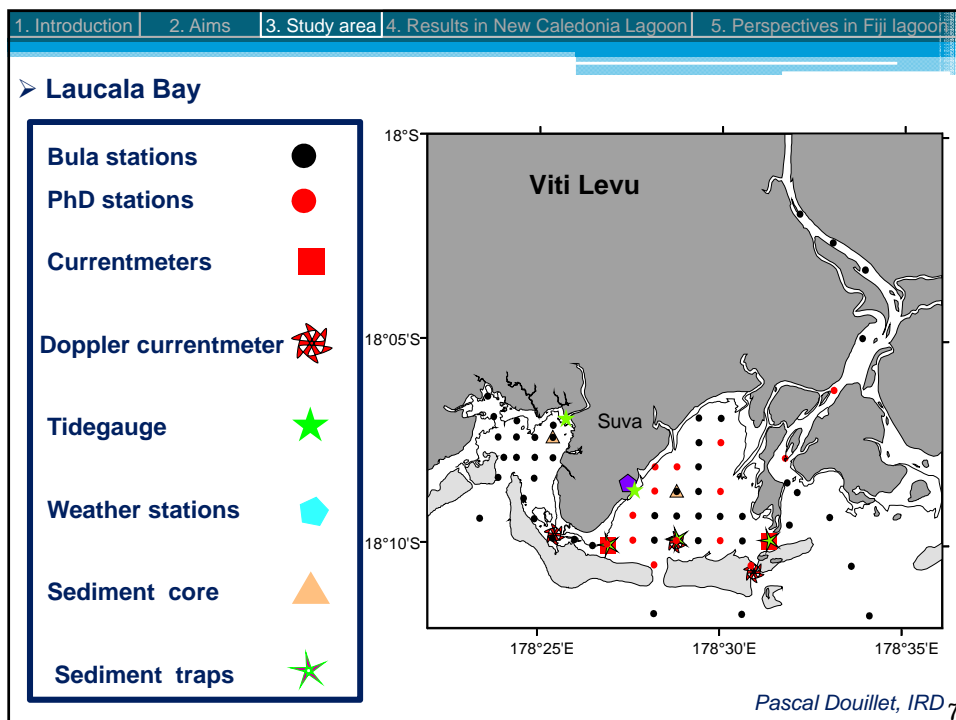
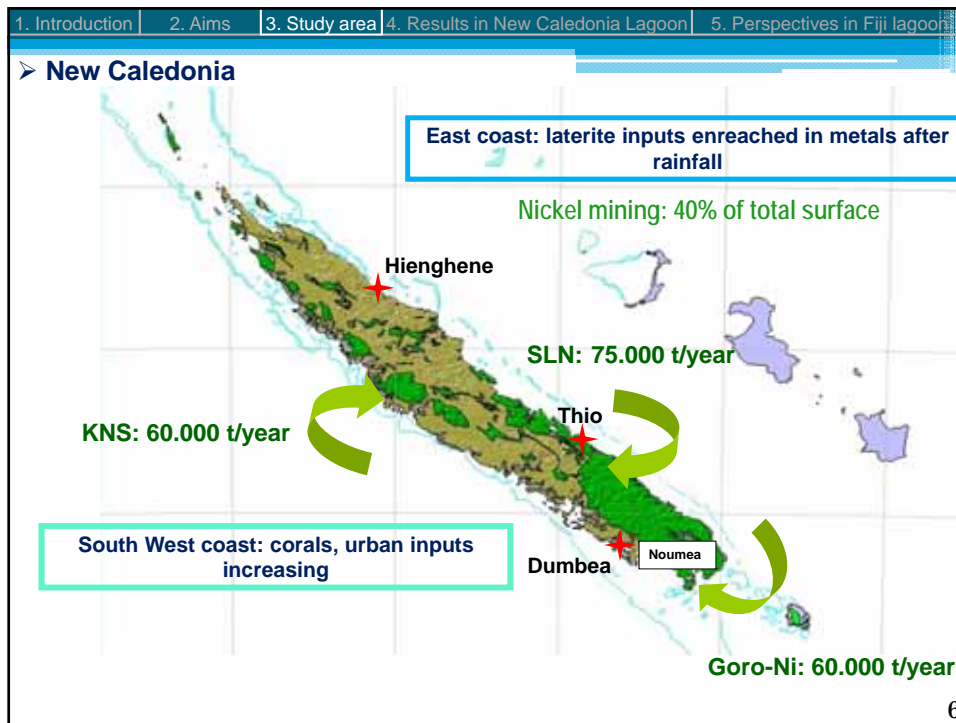
➤ Evaluate sources of CDOM and characterize its compounds:

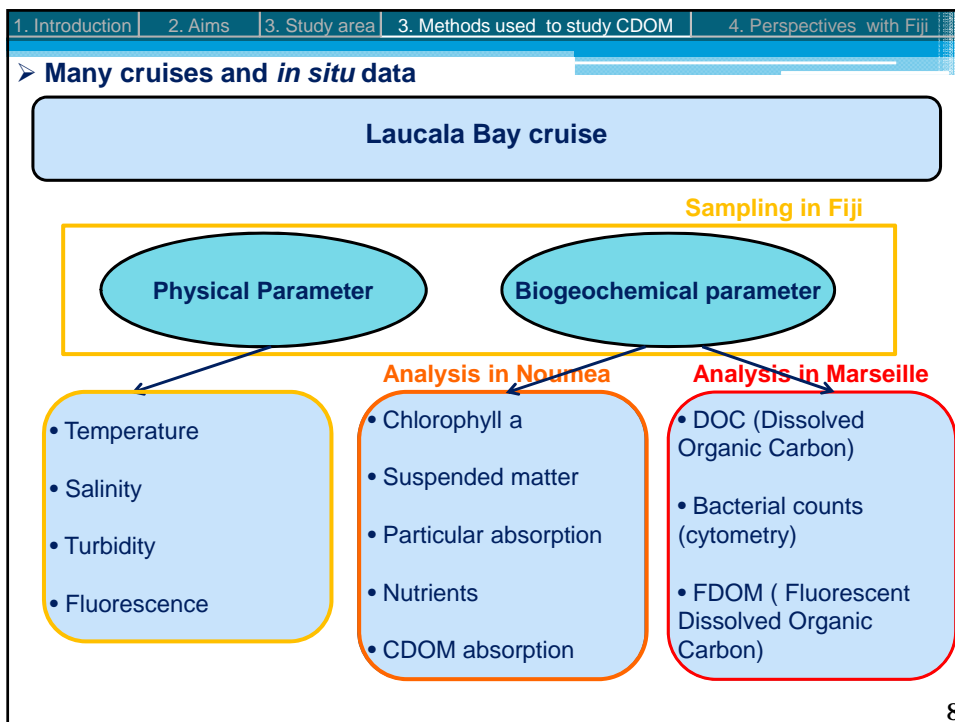
**1. Marine sources                      2. Terrestrial sources                      3. Anthropogenic sources**

**Sources and sinks of CDOM**

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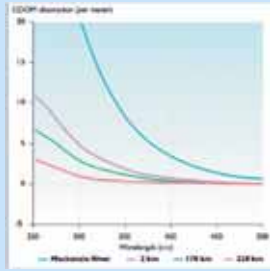




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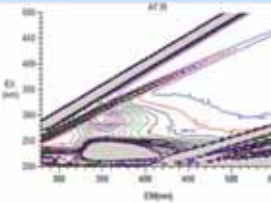
➤ **PhD originality: coupling 3 methods of CDOM measurement**

**Absorbance: LWCC and PSICAM**



- **LWCC:** CDOM absorption 280-800 nm
- **PSICAM:** CDOM absorption + Total absorption 370-800 nm

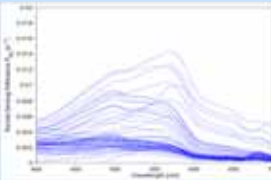
**Fluorescence: EEM/ PARAFAC**




Characterization and quantification of FDOM:

- Tyrosine-like
- Humic-like
- Tryptophan-like

**Reflectance: radiometer TRIOS**



- Sea captor
- Atmosphere captor



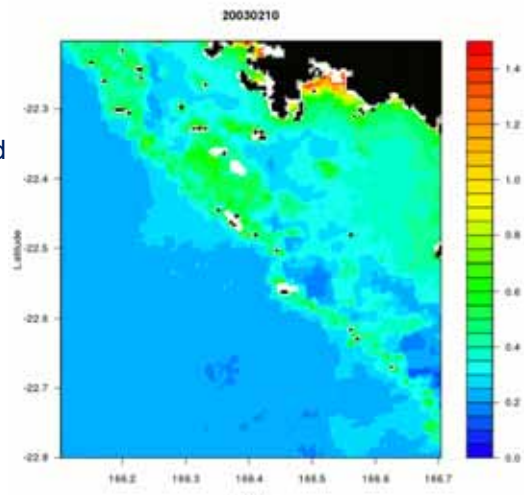
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➤ **Satellite data**

- Temporal series with AQUA MODIS data
- Chlorophyll algorithm developed with in situ data
- Satellite data validated: backscattering, reflectance, SST, chlorophyll...
- coupling with meteorological data

➔ Exceptional event shown

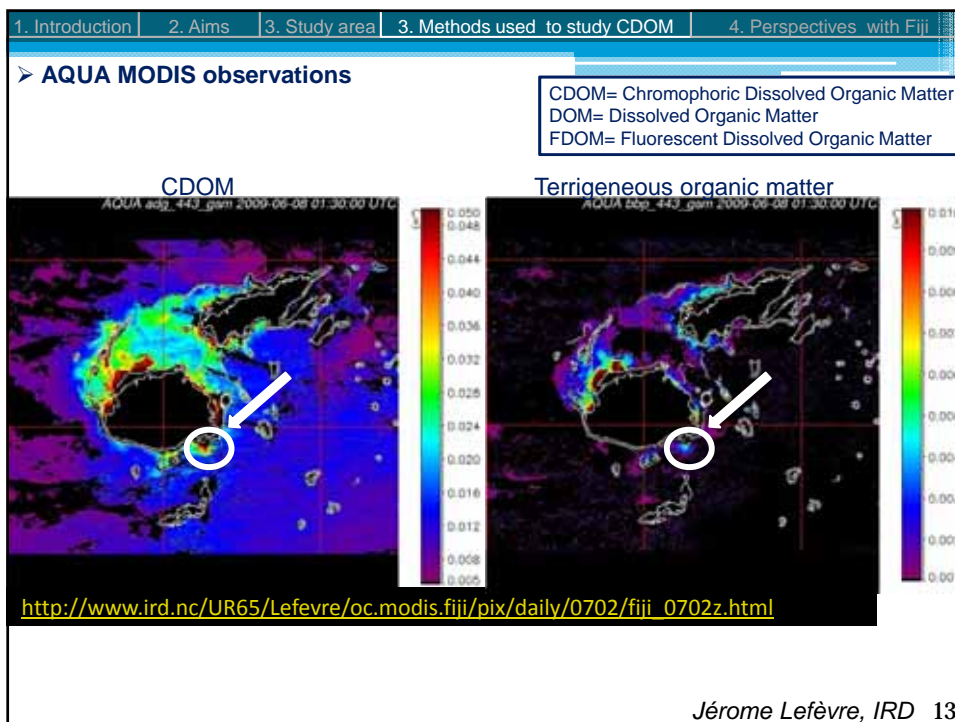
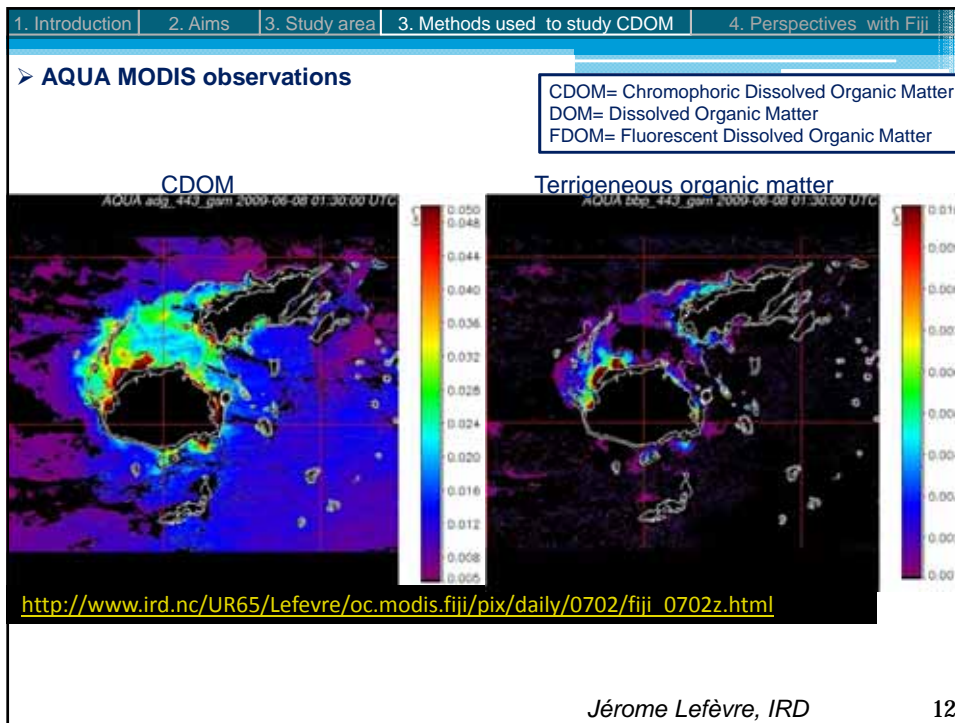


Temporal series of Chl A with a resolution of 500m, interpolation for cloud

*Wattelez Guillaume ,UNC/IRD*

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➤ **PhD results in progress**

**PAHs (U2 U1):** anthropogenic activities due to maritime traffic (small ship)

**Tryptophan (T1):** biological activity of coral reef ecosystem

Fluorophores at the stations 23 and 44 in Laucala Bay, June 2015, PARAFAC

Chloé Martias, IRD/MIO 14

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➤ **PhD results in progress**

Hydrodynamic circulation in Laucala Bay, MARS 3D

Pascal Douillet, IRD/MIO 15



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➤ **Pacific Fund 2016**


**Objective:**  
Understand physical and biogeochemical dynamics of Laucala Bay for a better sustainable management of this area.

**Scientific questions:**

- What is the relationship between the residence time and the composition of CDOM ?
- What are the impacts of natural forcings ( tides, winds, freshwater inputs, seasonal variability, ...) on the composition and distribution of CDOM ?
- How do anthropogenic impacts (agricultural and urban activities) modify the dynamics of CDOM?

**Program:**

- Exchange between 2 Fijian and New Caledonian students
- Training in New Caledonia and monitoring in Fiji.



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**Register for a cruise in Laucala Bay this Thursday at 8 AM!!!**

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**Thank you for your attention**

**Vinaka Vakalevu**

