Training Workshop 2 Brief Description

Title: C-CASCADES Training Workshop 2 - Regional to global modelling	
Date(s): 13th – 17st March 2017	**Location**: CRNS-IPSL, Paris, France
Lead institution: CNRS-IPSL	**Type**: Training Workshop
Contact name: Leo Rodrigues **Local Contact**: Bertrand Guenet	**Contact email**: j.leandro-rodrigues@exeter.ac.uk **Local contact email**: bertrand.guenet@lsce.ipsl.fr

Description:

The main objective of this C-CASCADES Training Workshop is to achieve a better understanding of the biogeochemical modules (land and ocean) from an Earth System Model (ESM).

It will also provide participants with an understanding of the physical basis of the feedback analysis developed by Hanssen et al (1984) distinguishing between the geochemical sensitivity of the ocean (land) carbon uptake to CO_2 (β) and the ocean (land) carbon uptakes sensitivity to climate change, which is negative and large (γ).

Training will be embedded to make a breakthrough in understanding the carbon/climate feedbacks at global and regional scales and give a basic knowledge on the tools used classically in ESMs outputs analysis (ferret, python, nco, etc.).

This training workshop will have lectures (focus on basic science or on more technical aspects), delivered by carbon cycle experts from inside and outside the C-CASCADES network, followed by practical work to learn how to run PISCES and ORCHIDEE the ocean biogeochemistry model and the land surface model of the ESM developed at IPSL. Participants will calculate β and γ factors using CMIP5 outputs and/or the TOTEM outputs obtained during previous network training events.

Outcome for all participants: ECTS credit certificate
The participants are expected to acquire the following skills and knowledge during this workshop:

1 - Understanding the basics of the carbon/climate feedback analysis;

2 - An overview on tools used classically with ESMs outputs;

3 - General understanding on the β and γ concept.

Assessment criteria:
1 – Analysis of the ORCHIDEE and PISCES outputs: (a) to be presented in groups of 2 (max. 10 mins) on 17th March, and (b) technical report (groups of 2) to be submitted electronically by 31st March;

2 – Calculation and analysis of the β and γ from CMIP5 and TOTEM outputs: (a) to be presented in groups of 2 (max. 10 mins) on 17th March, and (b) technical report (groups of 2) to be submitted electronically by 31st March
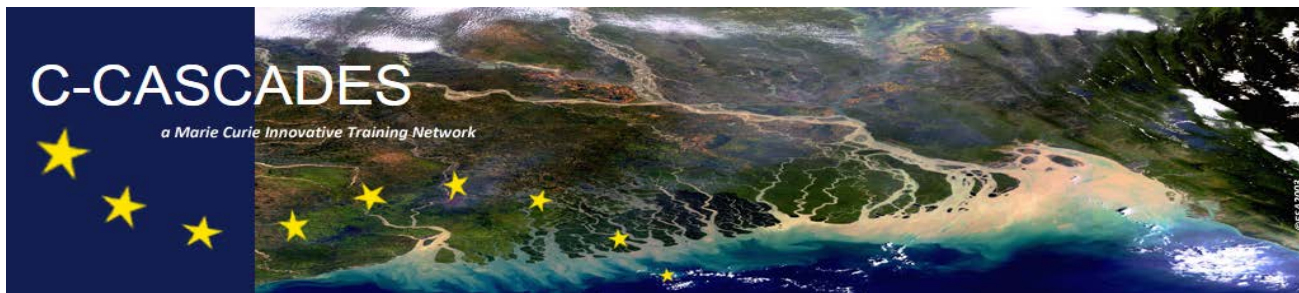
3 – Overall engagement in the workshop, such as practical work training, expert lectures and wrap-ups.

ECTS awarded: 3	**Awarding institution**: CNRS-IPSL

Registration:
If you wish to register for this event, please send an email (including a CV and a motivation letter for non-C-CASCADES students), before **10 February 2017** to the "Contact email" above and add to the subject line "C-CASCADES Training Workshop 2 external application". *Maximum participants: 20.*

Indicative Timetable

Monday, 13th March 2017

10:00-10:30 Welcome and Introduction (**Bertrand Guenet**), round table of participants
10:30-12:00 **Pierre Friedlingstein** (University of Exeter): *Carbon-climate feedback analysis: β and γ*
12:00-13:00 Lunch
13:00-14:30 **Laurent Bopp** (IPSL): *An ocean biogeochemical model*
14:30-15:00 Coffee break
15:00-16:30 **Philippe Peylin** (IPSL): *A land surface biogeochemical model*
16:30-17:00 **Patrick Brockmann** (IPSL): *iPython Notebooks*

Tuesday, 14th March 2017

09:00-10:30 **Anne Cozic** (IPSL)**:** *Unix commands to manipulate files, explore data & work with models*
10:30-11:00 Coffee break
11:00-11:30 **Cathy Nangini** (IPSL): *An effective structure for slides in oral presentations*
11:30-13:00 **James Orr** (IPSL): *Common format to store model data: netCDF*
13:00-14:00 Lunch
14:00-17:30 **Practical work - Christian Ethé (IPSL):** *Download, compile, & run NEMO-PISCES model on 1 grid cell*
17:30-18:00 Wrap-up
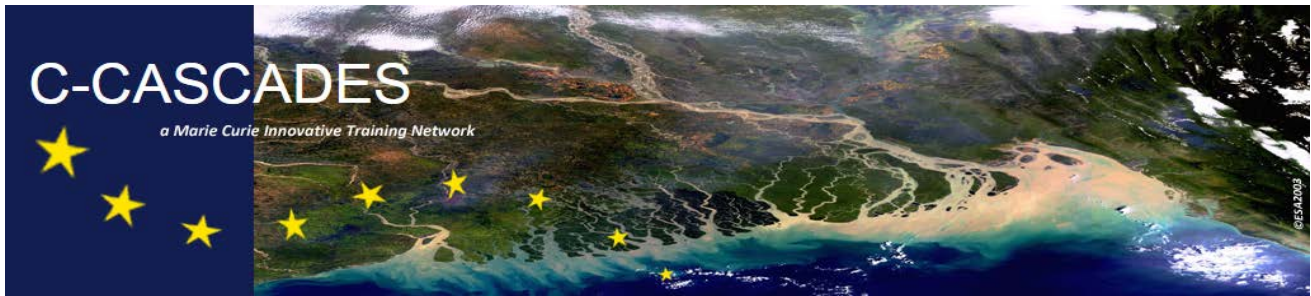
Wednesday, 15th March 2017

09:00-10:30 **Patrick Brockmann** (IPSL)**:** *A tool for model & data analysis: Ferret*
10:30-11:00 Coffee break
11:00-13:00 **Sabine Radanovics** (IPSL)**:** *Tools to manipulate model output: CDO and NCO*
13:00-14:00 Lunch
14:00-17:30 **Practical work - Josefine Ghattas** (IPSL)**:** *Download, compile, & run ORCHIDEE model on 1 grid cell*
17:30-18:00 Wrap-up

Thursday, 16th March 2017

09:00-12:30 **Practical work - Bertrand Guenet** (IPSL)**:** *Run PISCES & ORCHIDEE under 3 scenarios: $2xCO_2$, $+2℃$, $2xCO_2$ & $+2℃$*
12:30-14:00 Lunch
14:00-18:00 **Practical work - Bertrand Guenet** (IPSL)**:** *Compute regionally varying β and γ from CMIP5 output & TOTEM model*
18:00-18:30 Wrap-up

Friday, 17th March 2017

09:00-11:00 Presentation of the results of the practical work by ESRs
11:00-11:30 Wrap-up and closure

Logistics brief

Important note: Although the training event itself is free to attend for external participants, any other costs, such as accommodation, travel and subsistence, are to be covered by them.
Further information will be provided once an offer to attend is firmly accepted.

Location

Université Pierre et Marie Curie (UPMC)
4, Place Jussieu
75005 Paris
France

Lecture room (everyday, except Tuesday): LATMOS, Tower 45, hallway 45/46, 4th floor
Lecture room on Tuesday: LMD, Tower 45, hallway 45/55, 3rd floor
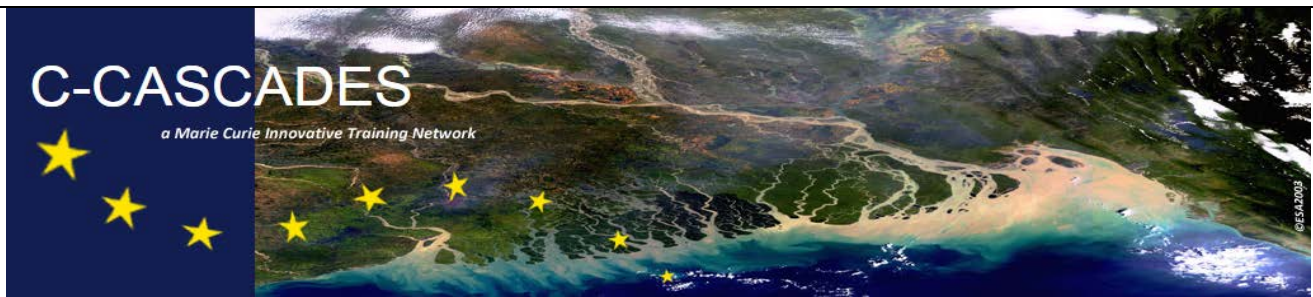
Access by public transport

1 – Metro: Line **7** or **10**, stop 'Jussieu'

2 – Bus: Line **67** or **89**, stop 'Jussieu'

3 – Enclosed a [metro map](#) and [bus map](#) of Paris. Below a map of the UPMC campus to find the lecture room

Map of UPMC – Campus Jussieu

Indicative Syllabus

Block 1: Practical training	
Length: 9.5 hrs contact time + 5.5 hrs preparation time (15 hrs)	**Time slot**: various
Trainer: various	**Requirement**: laptop / TOTEM

Description:

A series of practical work sessions will cover the following technical operations:

(i)   Practical computer exercises will be performed to understand, download, compile and run the ORCHIDEE and PISCES model and compute/model the;

(ii)   Practical computer exercises to estimate the β and γ factors from CMIP5 outputs.

Participants are expected to actively engage with these technical and practical sessions.

Block 2: Expert lectures	
Length: 13.5 hrs contact time + 9 hrs preparation time (22.5 hrs)	**Time slot**: various
Trainer: various	**Requirement**: key articles

Description:

Expert lectures will provide the theoretical framework to this workshop.

Participants are required to actively engage with the discussion after each lecture. Participants will be provided with key reading key papers in advance to stimulate these discussions.

Block 3: Wrap-up and outcomes	
Length: 4.5 hrs contact time + 45 hrs preparation time (49.5 hrs)	**Time slot**: various
Trainer: various	**Requirement**: practical work

Description:

Participants will work towards and complete the following tasks:

(i)   Analysis of the ORCHIDEE and PISCES outputs;

(ii)   Calculation and analysis of the β and γ from CMIP5 and TOTEM outputs.

For each task, each group of 2 participants will have to deliver the following outcomes:

a.   A short presentation (max. 10 mins), to be delivered on 17th March;

b.   A short technical report, to be submitted electronically by 31st March.

Further task guidance will be provided during the workshop.

In addition, participants will actively engage with the wrap-up sessions at the end of each day as a collaborative plenary for the new and existing theoretical and technical learning.