

Remontée des sujets CSC 2019-2020

Ecole Doctorale / Doctoral School	iences de la Terre et de l'Environnement et Physique de l'Un
Titre du sujet / Subject title	face chemical alteration on geomorphological evolution of t
Encadrant(s) / advisor(s)	Jerome Gaillardet - Eric Gayer
Laboratoire et équipe / Lab and research team	Géochimie des Enveloppes Externes
Coordonnées / address	1 rue Jussieu 75005 Paris
Etablissement / Institute	Institut de Physique du Globe de Paris
Pôle / Research axis	

Description of the subject

The study of erosion processes, erosion rates and their links with climate is an important scientific question and matter of long- standing and continuing debate. Chemical weathering and physical erosion (and associated sediment transport) that allows the denudation of the continental surfaces are among the most important processes that drive earth's surface morphology. The physical erosion that controls topography and slopes produces fresh surfaces for chemical weathering that in turn consumes atmospheric CO₂, making these erosion processes important players in the feedbacks between climate and tectonics.

Water is the primary agent of denudation processes (mechanical erosion + chemical weathering), and rivers are visibly prominent watercourses. Consequently, the solute transport and channel-incision rates of rivers have been extensively studied. It has long been assumed (in the traditional framework of the stream power law) that only the stream water in contact with the river bed directly contributes to the channel incision. However, (i) the subsurface rocks become chemically altered and weakened by the passage of infiltrated water (depending on the water-rock contact time, or water residence time) and (ii) water can show complex behaviors such as groundwater discharge into stream water.

This project aims to unveil the behavior of water in the subsurface using hydrological models, calibrated by innovative geochemical tracers, in order to test the hypothesis that infiltrated water causes subsurface weathering which promotes the channel incision and catastrophic erosion processes.

Tropical volcanic islands are excellent natural laboratories to study erosion processes since 1) the

Type de financement M2 + 36mo. ☐ 48 mo. ☒

Funding type

(cocher la case correspondante)

Le cas échéant, titre du master

Ecoles doctorales

ED 120 - Littérature française et comparée
ED 122 - Europe latine, Amérique latine
ED 127 - Astronomie, Astrophysique de l'Île de France
ED 129 - Sciences de l'environnement
ED 130 - Informatique, Télécommunications et Electronique de Paris (EDITE)
ED 131 - Langue, Littérature, Image, civilisations et sciences humaines [...]
ED 132 - Sciences du langage
ED 146 - Sciences technologies, santé "Galilée"
ED 158 - Cerveau, Cognition, Comportement
ED 180 - Sciences humaines et sociales [...]
ED 234 - Ecole doctorale de Sciences Po
ED 261 - Cognition, Comportements, Conduites Humaines
ED 262 - Sciences juridiques, politiques, économiques et de gestion
ED 265 - Langues, littératures et sociétés du monde
ED 267 - Arts & Médias
ED 268 - Langage et langues : description, théorisation, transmission
ED 382 - Economies, espaces, sociétés, civilisation, pensée critique, politique et pratiques soc
ED 386 - Sciences mathématiques de Paris Centre
ED 388 - Chimie Physique et Chimie Analytique de Paris-Centre
ED 393 - Pierre Louis de Santé Publique à Paris [...]
ED 400 - Savoirs scientifiques [...]
ED 434 - Géographie de Paris-Espace, Sociétés, Aménagement
ED 450 - Recherches en psychanalyse et psychopathologie
ED 474 - Frontières du Vivant
ED 493 - Erasme
ED 514 - Etudes Anglophones, Germanophones et Européennes
ED 560 - Sciences de la Terre et de l'Environnement et Physique de l'Univers, Paris
ED 561 - Hématologie, Oncogénèse et Biothérapies
ED 562 - BIO Sorbonne Paris Cité
ED 563 - Médicament, toxicologie, Chimie et Imageries
ED 564 - Physique en Île de France
Réseau Doctoral en santé publique

Pôles

Sciences Exactes et Technologie / Exact Sciences and Technology
Sciences de la Vie et de la Santé / Life and Health Sciences
Humanités, Arts, Lettres et Langues / Humanities, Arts, Languages and Literature
Sciences Sociales et Politiques Publiques / Social Sciences and Public Policy

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