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CLIMATE IMPACT RESEARCH EXPERTISE OF THE C&R LAB

SAVE THE DATE Meet the FORTHM's Climate & Resources Lab

October 8, 2021 | 9-13 CET | Hybrid workshop



Funded by the Horizon 2020
Framework Programme of the
European Union



Photo by Sebastian Unrau on Unsplash

Dr. Geraldina Signa
geraldina.signa@unipa.it



**Università
degli Studi
di Palermo**



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CLIMATE IMPACT RESEARCH EXPERTISE OF THE C&R LAB

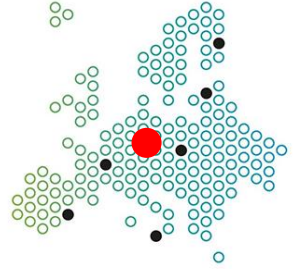
SAVE THE DATE Meet the FORTHM's Climate & Resources Lab

October 8, 2021 | 9-13 CET | Hybrid workshop



Photo by Sebastian Unrau on Unsplash

- Effects of climate change and anthropogenic change on marine and terrestrial ecosystems (e.g., invasive species, pollution dynamics, soil erosion)
- Mitigation of the effects of climate change and anthropogenic change on ecosystems



Natural Hazard Research and Geoarchaeology

Head of the Group

Prof. Dr. Andreas Vött

Scientific Staff

Dr. Peter Fischer

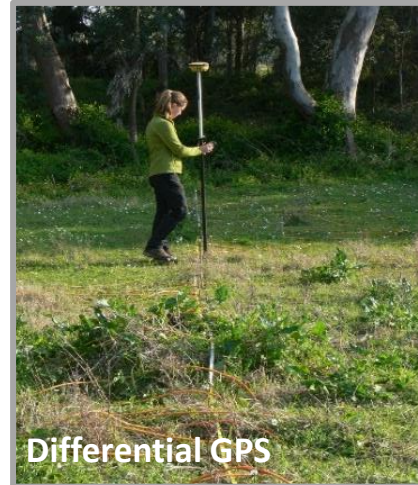
Dr. Hanna Hadler

Dr. Lea Obrocki

Dr. Timo Willershäuser



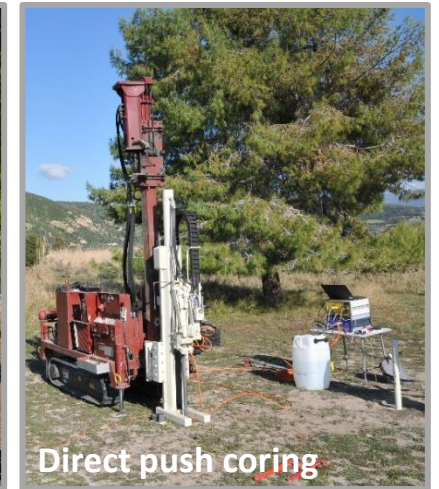
Cobra coring



Differential GPS



Sediment coring (drill rig)



Direct push coring



Magnetics



ERT



GPR

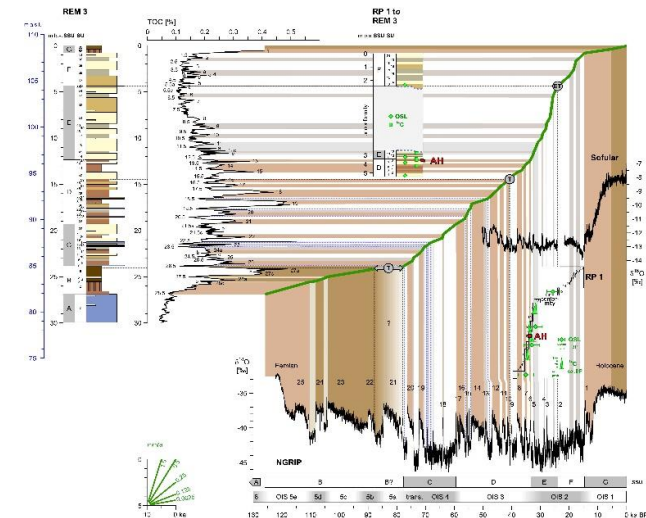
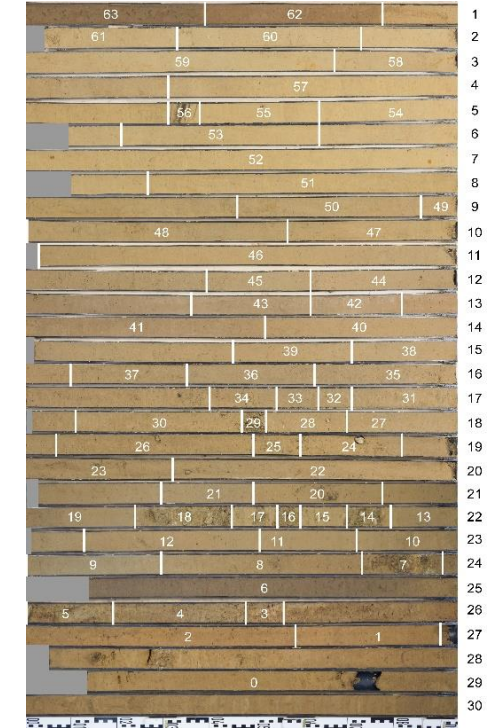
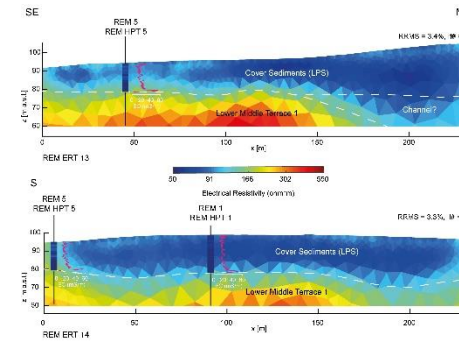
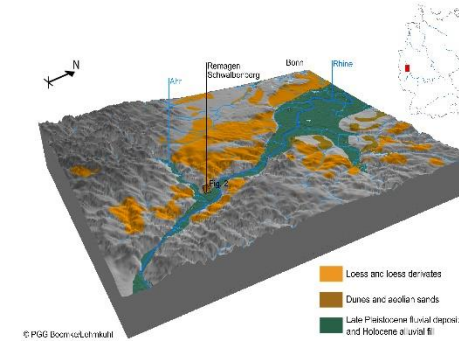


Seismics



DFG Project “TERRACLIME”

- Reactions of terrestrial systems to the lastglacial nordatlantic climate change within high resolution data (since 2017)
- Innovative multi-method approach (geophysics, in-situ borehole, sedimentology, geochemistry)
- High-resolution ^{14}C dating at earthworm-calcite granuals, tephrochronology und luminescence
- Interdisziplinäry co-work with RGZM, MONREPOS (palaeolithicum) and MPI-C (luminescence)
- Projektleader: Dr. Peter Fischer, PD Dr. K. E. Fitzsimmons, Prof. Dr. A. Vött





Working Group: Geoinformatics (MABEIS project)

Head: Prof. Dr. Frieder Enzmann enzmann@uni-mainz.de
 Vice head of Landslide Research Center at Johannes Gutenberg-University Mainz
www.researchgate.net/project/MABEIS-Mass-movement-Information-System
www.forschungstellerutschungen.de/en/home/



Research Methods

We use different kinds of open-source software for geological and geomorphological analysis, modelling and processing TBs of data sources, remote sensing, UAS etc...



High resolution DTMs and other input data (geology, landslide databases, vegetation, soil, weather and climate data, etc.) and intensive field work are used to simulate rockfalls, landslides and debris flow events. The goal is to identify hazards for infrastructure and to implement preventive measures, e.g. rock falls.

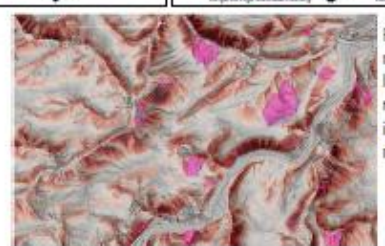
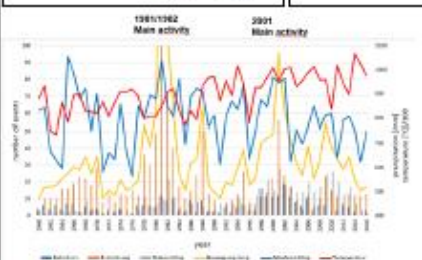
The MABEIS-Project aims to create high-resolution and dynamic process-based Vulnerability- and Susceptibility-Maps for different kinds of Mass-Movements within the Rhineland-Palatinate area



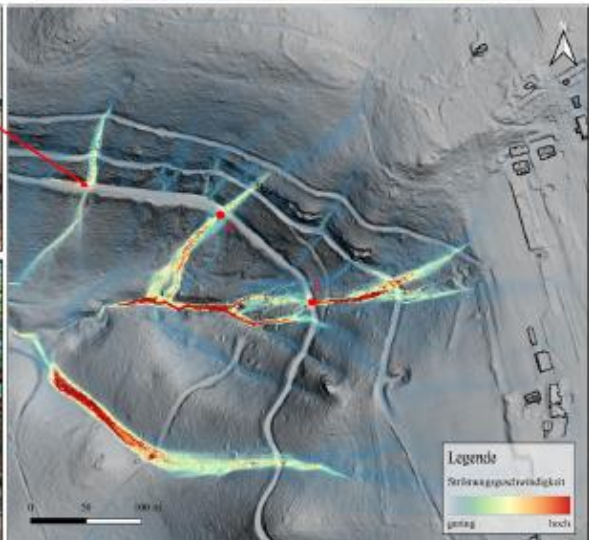
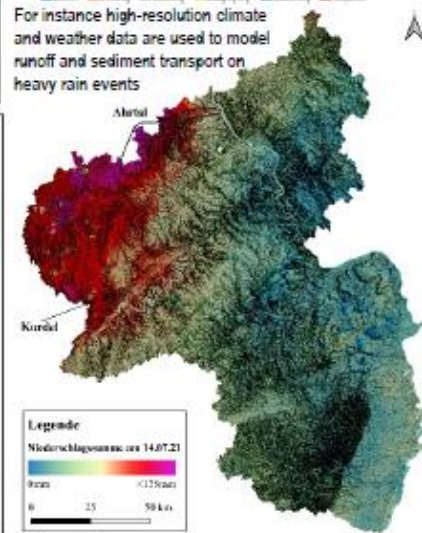
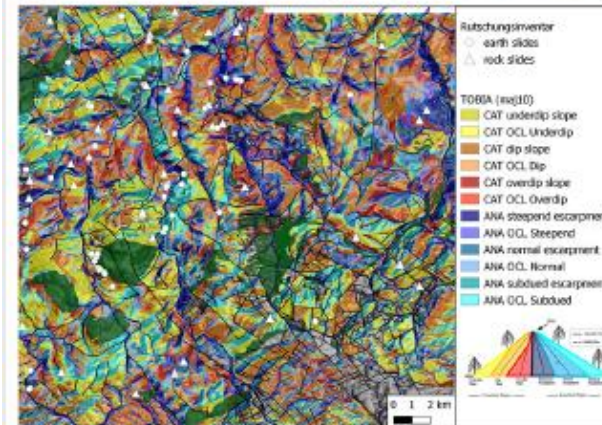
Prof. Dr. Frieder Enzmann, Teemu Hagge-Kubat, MSc, Philip Süßer, MSc, Andrea Wern, MSc

Recent Publications:

- Hagge-Kubat et al. (2021): Modellierung der Felssturzgefährdung am Mittelrhein- und Moseltal. – Mainzer Geowiss Mitt, 49: 197-220; Mainz
- Werner et al. (2021): Analyse des Einflusses der Lagerungsverhältnisse auf die Rutschungssuszeptibilität unter Verwendung eines erweiterten TOBIA-Modells. – Mainzer Geowiss Mitt, 49: 81-104; Mainz
- Hagge-Kubat et al. (2020): Simulation von Abfluss und Sedimenttransport bei Starkregenereignissen im Oberen Mittelrheintal. – Mainzer Geowiss Mitt, 48: 7-32; Mainz



Relief energy mappings and landslide, rockfall inventory modeling



Department of Geography, University of Latvia

Impact of climate change and disturbances (natural and anthropogenic) on terrestrial and aquatic environments

RESEARCH KEY WORDS: **VEGETATION**, **HUMAN**, **LANDSCAPE**, **CLIMATE**, **LAKES**, **BOGS**, FOREST HOLLOWS, **LATEGLACIAL**, **HOLOCENE**

GEOGRAPHICAL RESEARCH AREA



TEAM



NORMUNDS STIVRINS
(Prof. PhD Earth Sci.)
orcid.org/0000-0002-1136-0146
normunds.stivrins@lu.lv



LAIMDOTA KALNINA
(PhD Geography)
laimdota.kalnina@lu.lv

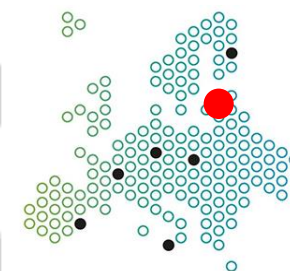


AIJA CERINA
(Msc. Geology)



NAURIS JASIUNAS
(PhD student)

COLLABORATION NETWORK



APPLIED METHODS, PROXIES & APPLICATION:

MACRO CHARCOAL



↓
FIRE
NATURAL VARIABILITY
HUMAN IMPACT
CLIMATE IMPACT

NON-POLLEN PALYNOFORMS

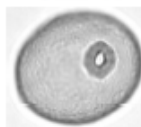


↓
AQUATIC:
ALGAL COMMUNITY
REFERENCE STATUS
CLIMATE IMPACT
HUMAN IMPACT



↓
TERRESTRIAL:
MUTUALISM
PATHOGENS
FIRE
LARGE HERBIVORES

POLLEN



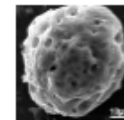
↓
VEGETATION
LANDSCAPE
HUMAN IMPACT
CLIMATE RECONSTRUCTIONS

PLANT MACROFOSSILS



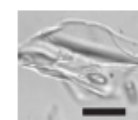
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LOCAL VEGETATION
PALEODIET
HUMAN IMPACT
GEOARCHAEOLOGY

SPHEROIDAL FLY ASH PARTICLES



↓
AIR POLLUTION
DATING METHOD

CRYPTOTEPHRA



↓
VOLCANIC ERRUPTIONS
TEPHROCHRONOLOGY

RUNNING & ASSOCIATED PROJECTS

EU COST Action CA18135: FIRE IN THE EARTH SYSTEM

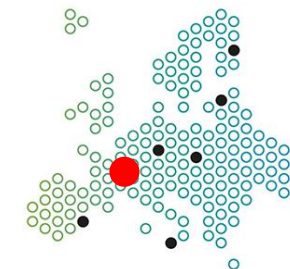
LATVIAN COUNCIL OF SCIENCE GRANT LZP-2018/1-0171: PEOPLE IN A DYNAMIC LANDSCAPE: TRACKING THE BIOGEOGRAPHY OF LATVIA'S SANDY COASTAL BELT

LATVIAN COUNCIL OF SCIENCE GRANT LZP-2020/2-0060: ESTABLISHING TRAINING DATA SET OF POLLEN AND NON-POLLEN PALYNOFORMS FOR LATVIA

UNIVERSITY OF LATVIA, JSC LATVIA'S STATE FORESTS, THE NATURE CONSERVATION AGENCY, LATVIAN PEAT ASSOCIATION PROJECT: STUDIES OF THE FIRE IMPACT ON THE BOG ENVIRONMENT AND RECOVERY

Biogéoscience Laboratory, University of Burgundy

Impact of climate change on resources, such as water and food



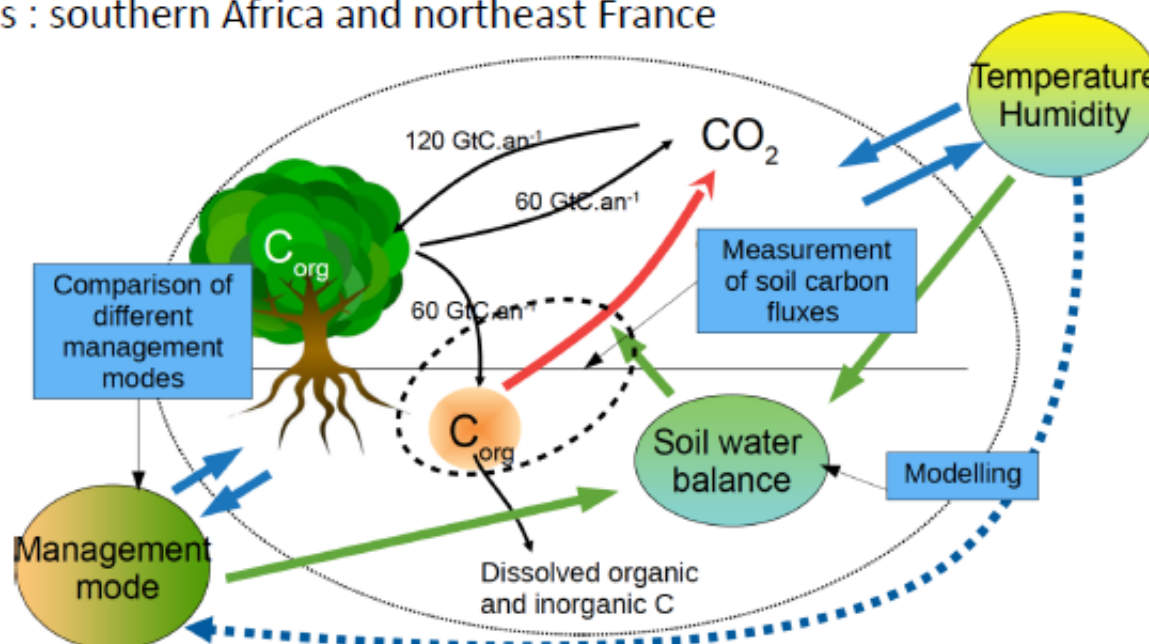
Biogéosciences laboratory : SEDS Team (climate – forest management – carbon fluxes feedbacks).

Contacts : Philippe Amiotte-Suchet, Olivier Mathieu

example : investigate the role of soil in the coupling between climate system and carbone cycle

=> Impact of climate change on land management, and impact of different land managements on soil CO₂ balance (C sequestration vs CO₂ degassing : net feedack to climate) - implication of climate modelers, hydro and soil geochemists, ecologists

=> Two areas : southern Africa and northeast France



Centre for Taste and Feeding Behavior (CSGA), University of Burgundy



Insect biocontrol, evolution of fruit and crop growing to invasive species and climate change, biodiversity protection

CSGA laboratory : Sensory Perception, Interactions between Glia and Neurons Team (works on molecular and cellular mechanisms allowing perception of volatil chemical signals).

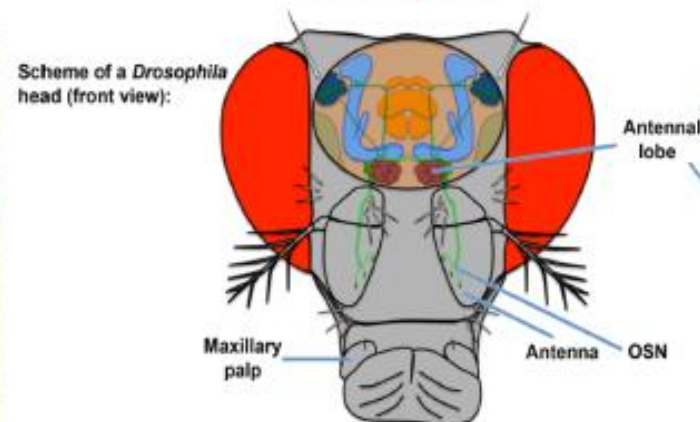
Contact : Yaël Grosjean

example : impact of climate change on invasive insect species affecting agriculture => innovative strategies to protect crops based on volatil chemical signals acting on odorant sensitive neurons (OSN) and olfactory glomeruli that modify reproductive behavior in the crop vicinity

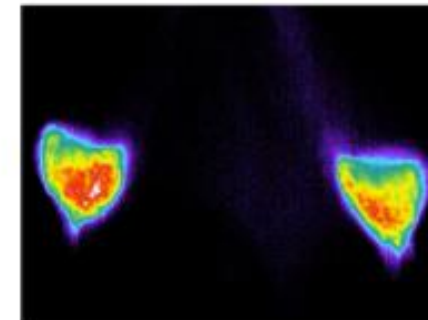
Blackcurrant crops



Drosophila



Calcium imaging



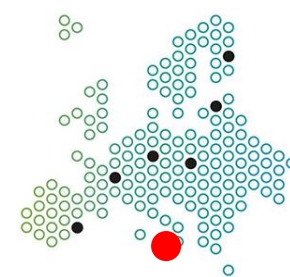


Laboratory of Marine Biology and Resources Laboratory of Aquatic Sciences

<https://www.unipa.it/dipartimenti/distem/laboratori-00001/labiomar/>
salvatrice.vizzini@unipa.it; agostino.tomasello@unipa.it



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Impact and Mitigation of Climate Change

Staff

Heads of the group:

Prof. Salvatrice Vizzini

Prof. Antonio Mazzola

Prof. Agostino Tomasello



Scientific staff:

Dr. Geraldina Signa

Dr. Cristina Andolina

PhD Students:

Dr. Roberta Bardelli

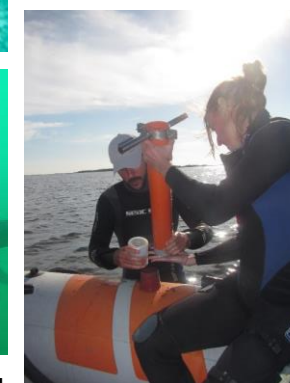
Dr. Laura Caviglia



**Ecosystem recovery following
seagrass transplants**



Ocean acidification



Carbon stock



Species invasion

Projects

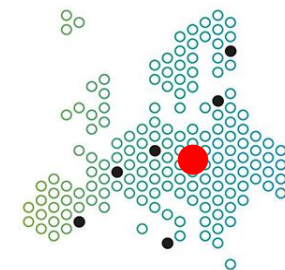
MARINE HAZARD (National Operative Programme, Italian Ministry of Education, University, and Research) - Development of innovative technologies for the identification, monitoring and mitigation of natural and anthropogenic contamination.

FOOD-CLIC (Programma Nazionale di Ricerche in Antartide; Italian Ministry of Education, University, and Research) - Influence of sea-ice cover changes on the food web structure and key species in the Ross Sea "MPA" in a context of climatic change.

RINASCE (PO FESR SICILIA 2014-2020) - Interventions aimed at recovering the environmental conditions of the Stagnone di Marsala basin: operational applications and elaboration of scenarios.

Methodological approach:

Stable Isotopes $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{34}\text{S}$ (IRMS and EA),
Fatty Acids (GC), organic contaminants (GC-MS),
major, minor and trace elements (ICP-EOS),
microplastics



Areas of the Scientific Activity

1. Wastewater treatment and utilisation of the treatment products
2. Biomonitoring of air, water and soil
3. Modelling and application of statistical methods in environmental processes description
4. Radioecological studies
5. Soil and sediment investigations
6. Migration of contaminants in environment
7. Alternative and renewable energy sources
8. Investigation of indoor environment and energy balance in households
9. Biological evaluation of environment and investigations of issues in agricultural industry and farming



University of Jyväskylä, School of Business & Economics

Corporate Environmental Management (group)



- **Members:** Prof. Hanna-Leena Pesonen, Assoc. Prof. Tiina Onkila, Dr. Annukka Näyhä, Dr. Stefan Baumeister, Dr. Marileena Mäkelä and doctoral students: Irene Kuhmonen, Bhavesh Sarna, Milla Sarja, Sami El Geneidy, Maija Lähteenkorva, Minna Käyrä & Esko Salo
- **Expertise of the group:**
 - Sustainability transition, sustainable business models, circular economy, future studies, assessment of climate and biodiversity impacts, life cycle assessment, resilience, sustainable consumption, de-growth, micro-foundation of organization for sustainability, qualitative research, forest-based sector, agricultural sector, transportation sector and tourism sector.
- **On-going research projects:**
 - CICAT2025: facilitating the transition from linear to circular economy
 - Sustainability for JYU: assessing the climate and biodiversity impacts of our university
 - Future-oriented collaborative business models as a remedy for the sustainability transition: Finnish forest-based sector as an empirical arena for the creation of a transition framework