



Pro
Ecos

WORKSHOP RILHAS

1 de maio de 2019 - Instituto de Ciências Biológicas - UFMG - Sala E3164

Can mountain headwater streams really be islands?

Realização:



P&D
GT - 599

Inscrições gratuitas e mais informações em <http://lebufmg.wix.com/bentos>

Program Schedule

8:30h - Opening Section of RILHAS WORKSHOP

8:50h - *Geraldo Wilson Fernandes*: Challenges for the conservation of Campos Rupestres

9:20h - *Fernando A. O. Silveira*: The OCBIL theory and the Campos Rupestres

9:50h - *Frederico S. Neves*: Using insects as tools for conservation in the campo rupestre

10:20h - *coffee-break* for the integration of lecturers and participants

10:50h - *Ricardo Solar*: Biodiversity conservation in the Anthropocene

11:20-12:30h – *Brainstorming session #1*: How can we scientifically contribute to fill the currently existing knowledge gaps in biodiversity conservation using ecological processes?

14:00h - *Robert Mason Hughes*: Headwater streams are critical for sustaining fish, fisheries, and ecosystem services

14:30h - *Victor Saito*: Merging theory and practice in the ecology of the Anthropocene

15:00h - *Valter M Azevedo-Santos*: Freshwater fishes in a Brazilian mountain: knowledge, scientific shortfalls, and actions for conservation

15:30h - *coffee-break* for the integration of lecturers and participants

16:00h - *José Francisco Gonçalves Jr.*: Organic matter dynamics in netropical mountain riparian metaecosystems

16:30-18:00h - *Brainstorming session #2*: How can we scientifically contribute to fill the currently existing knowledge gaps in biodiversity conservation using ecological processes?



Are headwater streams (trully) islands? - connecting land uses and sky islands -

Marcos Callisto

“Headwaters are upstream refugia and dispersal ability on the community response to deforestation is unknown.”

González-Trujillo et al. (2019) Biodiversity and Conservation 28:1513-1531

Main topics

- Rilhas Workshop motivations
- Serra da Canastra field trip (January 2019)
- Main purpose of this Workshop
- Scientific background
- Main topics to discuss



Rilhas Workshop motivation...

- **CNPq Project** – Edital 2018 UFMG, UNB, UFC (Ecology, Botany, Geography, Microbiology)
 - 9 professores, 4 pos-docs, 1 PhD candidate, 1 biologist
- Main ideas...
- # rejectionistherule
- Sowing new ideas... *RILHAS Workshop*



Operação Serra da Canastra (January 16-19th)

First discussions, basic
RILHAS schedule, preliminary
Abstract effort



Main purpose of this Workshop...

- Rethinking ecological practice to address contemporary challenges in the Anthropocene
- we aim to:
 - (i) provide evidence to support the idea that historically delimited sub-disciplines in Ecology remain conceptually isolated;
 - (ii) argue that gaps among individual research domains should be bridged to improve and enhance ecological understanding;
 - (iii) show that such trans-disciplinarily would provide effective insights to suffice societal aspirations (e.g. conservation biology, policy building).

The theory-to-application pipeline in ecology

Journal of Applied Ecology 2017, **54**, 1–6

doi: 10.1111/1365-2664.12855

EDITORIAL

Solving environmental problems in the Anthropocene: the need to bring novel theoretical advances into the applied ecology fold

Marc W. Cadotte^{*,1,2}, Jos Barlow^{3,4}, Martin A. Nuñez⁵, Nathalie Pettorelli⁶ and Philip A. Stephens⁷

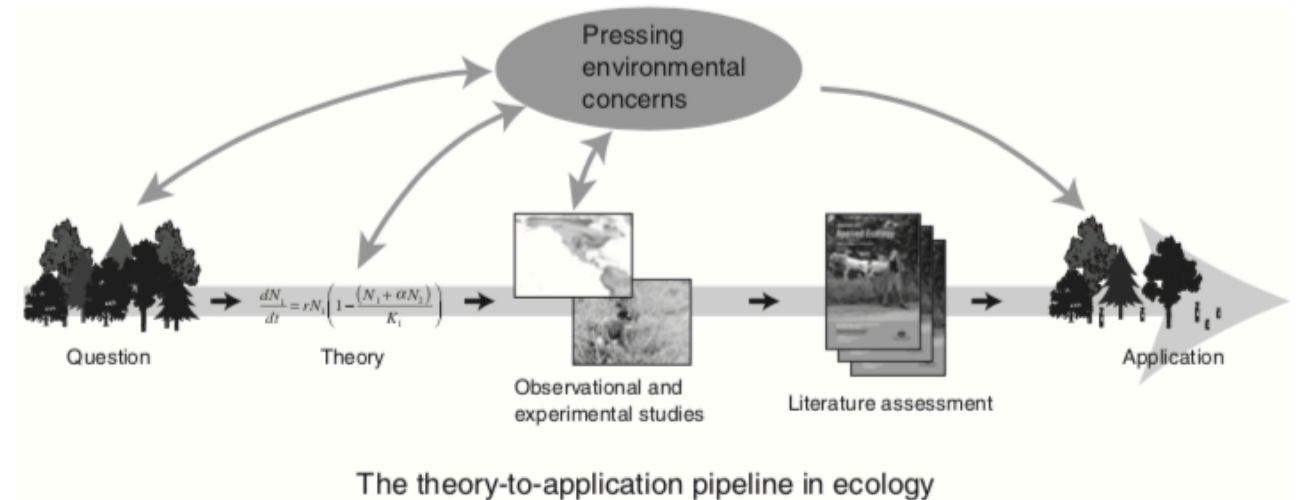


Fig. 1. The idealized theory to application pipeline in ecology. The transition from fundamental questions to application requires several critical transitions, from theory to experimentation, and the accumulation of studies into robust and generalized understanding, before designing applied actions. However, pressing environmental concerns might provide sufficient incentive to develop new theory and experiments, or justify circumventing the pipeline to develop applied actions based on incomplete information or theory development.

Campo rupestre

FITOFISIONOMIAS DO BIOMA CERRADO



FORMAÇÕES FLORESTAIS

FORMAÇÕES SAVÂNICAS

FORMAÇÕES CAMPESTRES

Mata Ciliar

Mata de
Galeria

Mata Seca

Cerradão

Cerrado
Denso

Cerrado
Típico

Cerrado
Ralo

Parque de
Cerrado

Palmeiral

Vereda

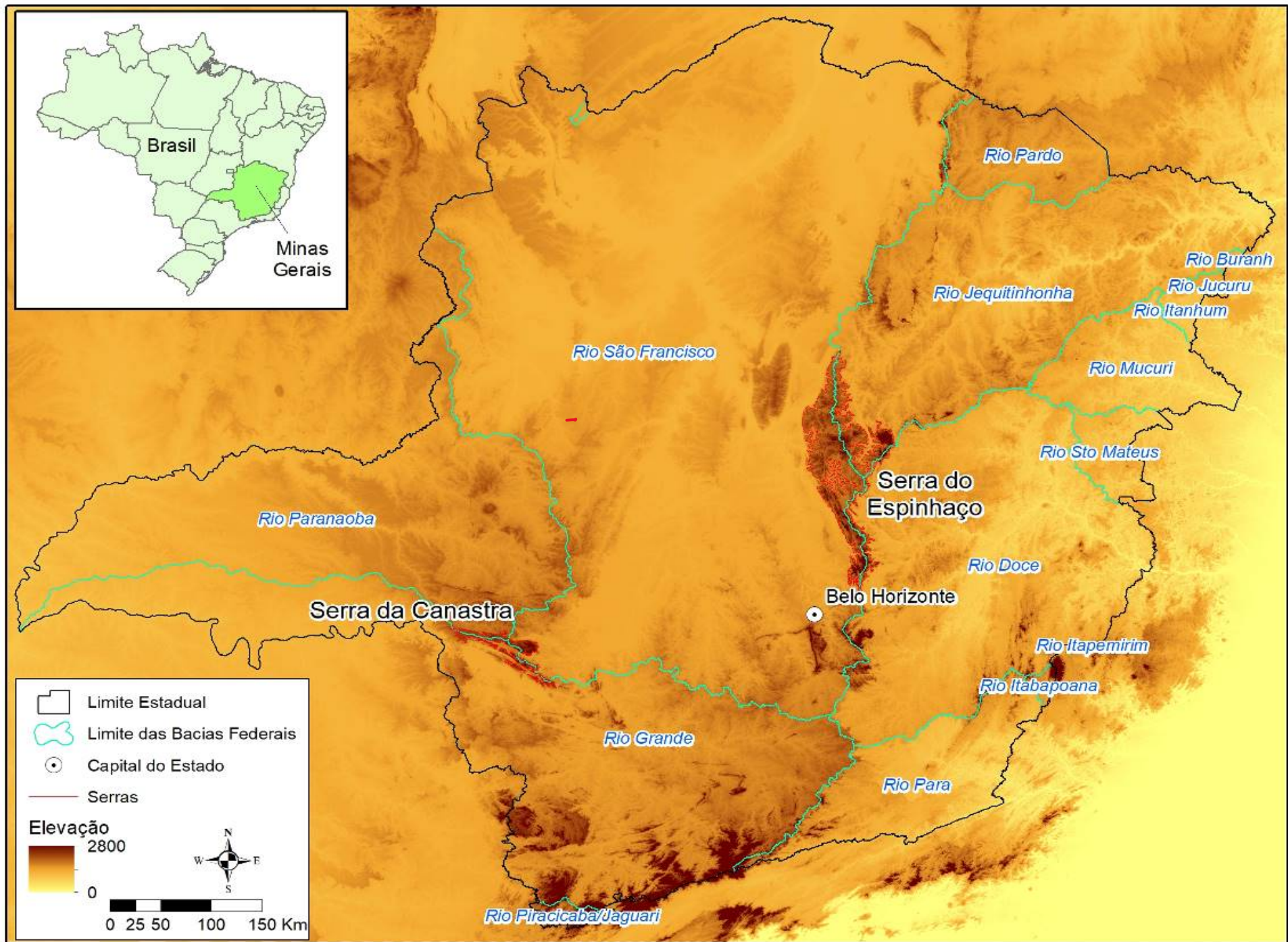
Cerrado
Rupestre

Campo
Rupestre

Campo
Sujo

Campo
Limp

Fonte: <https://www.embrapa.br/cerrados/colecao-entomologica/bioma-cerrado>



Campo rupestre

(hottest neglected tropical ecosystem)

- oldest top South American mountains connected by headwaters, valleys, human land uses.
- Matrix including natural environmental conditions, natural land cover & degrees of disturbance by human land uses.
- The majority of species diversity and ecological interactions on tropical regions are about forest ecosystems while the non-forest ones (CR included) are poorly investigated.

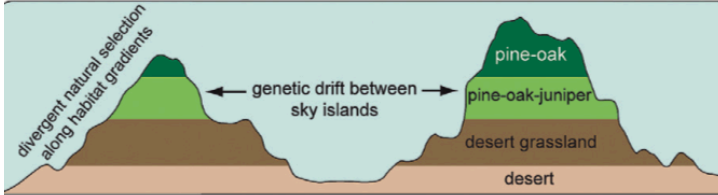


FIGURE 2 Schematic of the altitudinal distribution of habitats and examples of the evolutionary forces acting within and between typical Madrean sky islands of the southwestern United States and northern Mexico.

SKY ISLANDS

JOHN E. MCCORMACK, HUATENG HUANG,
AND L. LACEY KNOWLES

University of Michigan, Ann Arbor



Photo: Ricardo Solar

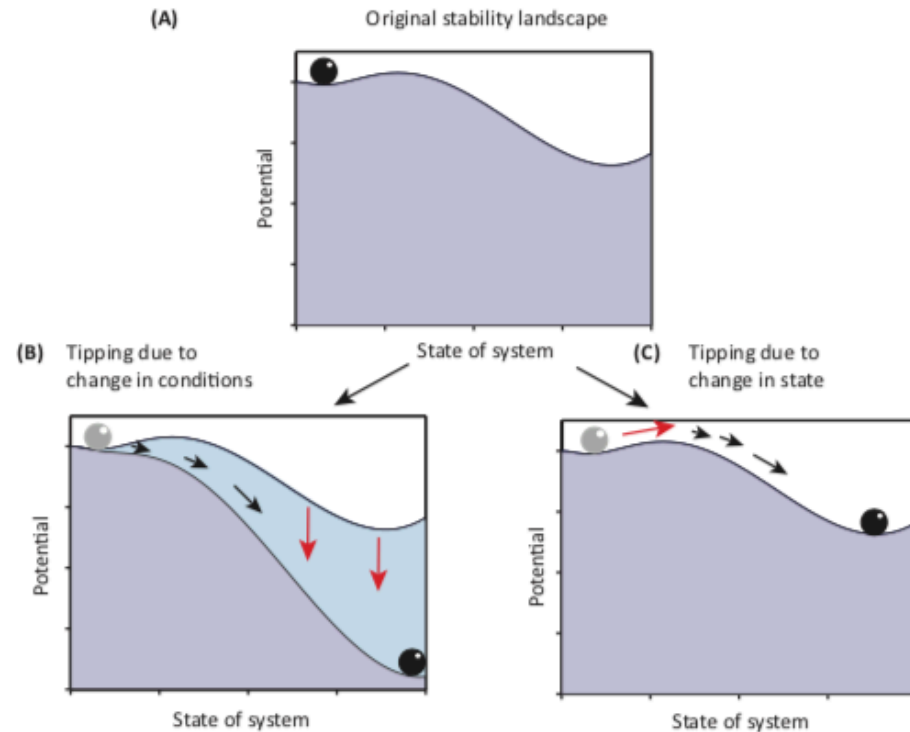
“endemism, altitudinal migration, and relict populations are some of the natural phenomena to be found on sky islands”

Tipping Points

Forum

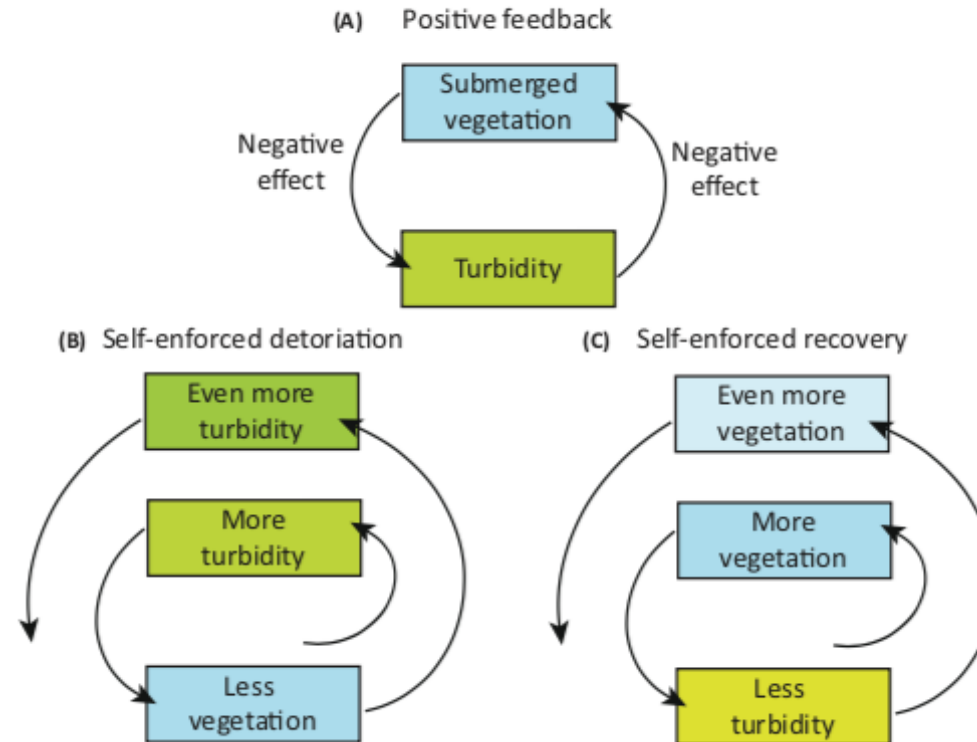
What Do You Mean, 'Tipping Point'?

Egbert H. van Nes,^{1,*}
Babak M.S. Arani,¹
Arie Staal,¹
Bregje van der Bolt,¹
Bernardo M. Flores,¹
Sebastian Bathiany,¹ and
Marten Scheffer¹



"...beyond a certain threshold, runaway change propels a system to a new state."

"...once a threshold is passed, the dynamics of the system accelerate dramatically to cause a runaway change."



"Feedbacks are defined as processes where changes in the state feed back to the inputs, and are termed stabilizing (or negative) if they dampen change, and selfenforcing (or positive) if they magnify change."

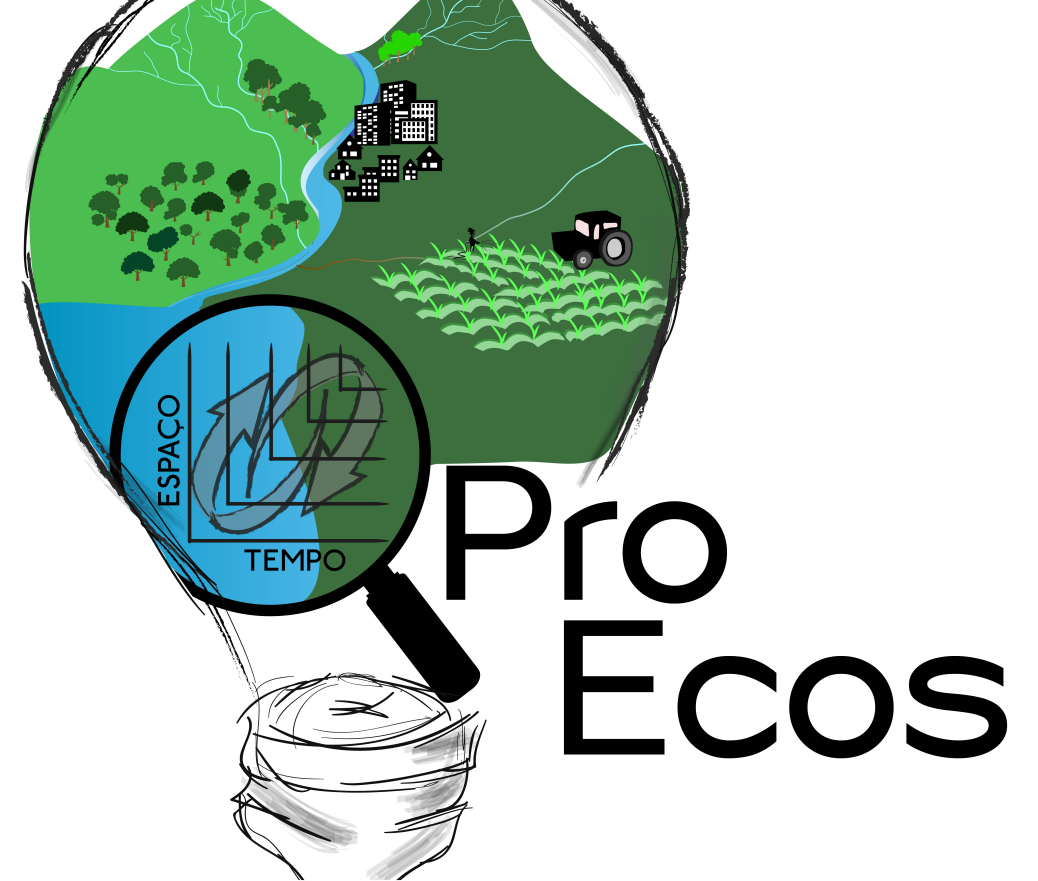
"Therefore, we propose that the term 'tipping point' should simply be used for any situation where accelerating change caused by a positive feedback drives the system to a new state."

Headwater streams connecting sky islands

- *Headwaters offer upstream refugia* - dispersal ability of biological communities response to human land uses is unknown.
- *Headwater streams are islands in landscape* with riparian metaecosystems forming natural corridors.
- Dendritic and continuous, connecting landscape matrix.
- Headwater streams connect mountain islands and cerrado streams on landscape valleys.
- Beta diversity of aquatic invertebrates increases along altitudinal gradient.
- Ecological interactions – migration, stream corridor, riparian meta-ecosystems.

Main topics to discuss

- (i) ***the importance of transdisciplinary collaborations*** for the development of studies of ecological quality and conservation of biodiversity;
- (ii) approaches towards ***ecological processes and methodologies at multiple scales*** (e.g, time, space, hierarchical and biological levels for transdisciplinary information);
- (iii) conservation of ***biodiversity and processes in megadiverse tropical regions***;
- (iv) ***environmental connectivity*** in a scenario of high tropical heterogeneity;
- (v) challenges in applying ***holistic and transdisciplinary approaches to solve environmental problems*** in the Anthropocene;
- (vi) urgency of ***biodiversity conservation effectiveness at multiple scales*** for a better understanding of the underlying variables influencing the ecological dynamic;
- (vii) ***changing attitudes in ecological thinking and applied ecology***: holistic approach towards nature vs. Anthropocene challenges versus actions “inside the boxe”;
- (viii) ***changing attitudes in pedagogical practice and training of future professionals*** in the environment, better prepared to critically deal with contemporary issues.



Welcome to the
RILHAS Workshop!!