IAI SGP Students Workshop
Guidelines and Agenda

Logistics:

Date and time: July 27th from 11 am to 1 pm (UYT, BRT, ART)

Zoom Link:

https://us06web.zoom.us/j/81939187390?pwd=QzJqdXBhdURFMUpkZnJRQWxaR0ttUT09

English-Spanish Interpretation will be available

Presenters please connect 15 minutes before

Guidelines for presentation:

Each students will have five minutes to present the main insights of their research, following as much as possible this template:

- Context of their own research in the SGP project
- Geographical context of the research
- Methodological aspects
- Key outcomes
- Challenges and opportunities of applying a transdisciplinary approach (if applicable)

A power point presentation is not required but the option to share screen will be available.

Agenda (UYT, BRT, ART):

11:00: Opening and Welcome

11:15: Students Presentations

12:15: Identification of crosscutting themes

12:30: Discussion on crosscutting themes in break out rooms

12:50: Final Plenary and Closing

Moderation: SGP PIs and IAI SteP Fellows

Participants and Abstracts:

Author: Ana Carolina Moreira Pessôa
Co-authors: João Bosco C. Reis, Nathalia S. Carvalho, Celso H. L. Silva Junior, Liana O. Anderson
Title: Climate change within Amazonian protected areas from 2003 to 2020
SGP Project: MAP-Fire
Abstract: Changes in global temperature are already affecting many ecosystems. Several studies have already evaluated climate trends in different regions of the world. Regionally, studying Amazon is fundamental due to its import role in the regulation of regional and global climate (Almeida et al, 2016; Gatti et al., 2021). Thus, knowing the recent trends in climate variables, such as temperature, in the Amazon can help to understand the intensity of human interference in regional climate, and consequently it can inform decision-makers about the current environmental condition for the formulation of adaptation and impact mitigation policies. Our main objective is to evaluate the spatial and temporal variability of annual trends in temperature during the dry season from 2003 to 2020, in the Amazon basin. We used the dry season onset and duration from Carvalho et al. (2020) to calculate the mean temperature during dry season for each year, considering the spatial distinctions from dry season period throughout the Amazon basin. Temperature data came from MOD11A2 product from MODIS/NASA. The data was aggregated into 5x5 km pixels. We first calculated the mean temperature per year for the entire study area to evaluate the general trend. Second, we performed a trend analysis, running linear regressions for each pixel, considering the time span from 2003 to 2020. Considering the slope signal of the regressions from each pixel, we classified them into positive or negative trend for rise and reduction in temperature, respectively. For the spatial trend analysis, we only consider pixels which linear regression was statistically significant ($p < 0.05$). It corresponds to 52% of total pixels. A water mask was applied, and all pixels over water were not considered in the analysis. From 2003 to 2020 it is possible to observe a positive trend of increase in average temperature during the dry season in the Amazon Basin ($p < 0.05$). This trend gave an absolute increase of 0.6°C comparing 2020 with 2003, with an average rate of increase of 0.03°C per year. We would have an increase of 1.23°C in 2030 compared to 2003, and by 2050 the increase would reach more than 2°C, if temperature continues to increase at the current rate. Spatially, most of the southern Amazon is imposed to increased temperatures. Most of the region known as Brazilian arc of deforestation is highly impacted by increased temperatures. And even, the central Brazilian Amazon, which houses the most pristine forests, is also impacted. Most of the pixels that presented significant negative trends of reduction in temperature are located either in central Colombia and Venezuela, at the edge of the Amazon basin border, and scattered in the north and northeastern Brazil. Nonetheless, they represent only 2% off all significant pixels. Of all pixels that showed statistically significant linear regressions, 98% presented a positive trend of increasing temperature from 2003 to 2020. If we consider all pixels, regardless of their significance, more than half presented a positive trend. As a global effort, an UN report has already shown that the national targets set in the context of COP26

are not enough to limit the global warming to the 1.5°C level(REF). Regionally, it is already possible to observe temperature increases that exceed the global goal for mid-century. Our work shows a positive trend towards an increase in the average annual temperature during the dry season in more than half of the Amazon basin from 2003 to 2020. Our results corroborate those of Almeida et al. (2016), which showed an annual increase rate in the average temperature of 0.03°C in the Brazilian Amazon for the period 1973 – 2013. Gatti et al. (2021) showed an average temperature increase that can reach 2.5°C in the southeastern Brazilian Amazon, analyzing the period from 2010 to 2018. During the dry season, a reduction of rainfall accompanied by temperature increase, could lead the ecosystems to a continually changing fire-prone environment. Our results also highlight the importance of short-term actions and policies aimed at adapting and mitigating the impacts that climate change is already imposing on Amazonian ecosystems.

Author: Giuliana Barden
Co-authors: Alberto Piola, Elbio Palma, Marcela Charo y Osmar Möller
Title: Small-scale Fisheries and Marine Ecosystem Services: Adaptation and Transformation to Secure Human Wellbeing
SGP Project: Small-scale Fisheries and Marine Ecosystem Services: Adaptation and Transformation to Secure Human Wellbeing
Abstract: The western South Atlantic shelf hosts one of the most productive marine ecosystems of the southern hemisphere. This productivity is mediated by the supply of nutrients from continental discharge primarily from the Río de la Plata, shelf currents and open ocean sources. The export of productive shelf-waters modulates the primary productivity over the shelf and has a significant biogeochemical impact on the open ocean. The Brazil and Malvinas Currents flow in opposite directions along the shelf edge and collide near 37.5°S forming the Brazil/Malvinas Confluence (BMC). These strong western boundary currents act as barriers to exchanges between the adjacent shelf and the open ocean. However, in-situ and satellite data, and numerical models suggest intense cross-shelf transports near the BMC. First, an oceanographic survey was used to obtain a synoptic characterization of the area. Then, a high-resolution global reanalysis was used to study the export of shelf-water between 30-40°S (TrOff) during 1993-2018. The model indicates that TrOff variability is mainly associated with the local winds in response to synoptic atmospheric systems. Extreme events typically last less than 2 days, imply that 4% of the shelf-water is replaced by open ocean water and reach four fold the average export.

Author: Franco Salvadores
Title: Desafíos transdisciplinares para un abordaje común de las crisis del agua
SGP Project: Governagua
Abstract: El actual contexto de crisis socio-ecológica y sus consecuencias sobre los sistemas hídricos conduce a cuestionar las formas de producción de conocimiento sobre la relación entre las sociedades y el agua. A lo largo del proyecto “Governagua: transformando la gobernanza del agua en América del Sur”, fue posible observar cómo este relacionamiento está marcado por las diferentes percepciones, lógicas y concepciones que tienen los actores de un territorio sobre el agua en función de su posición social, formación, identidad de género, edad o etnicidad. La diversidad de puntos de vista de la que el agua es objeto requiere de

abordajes que superen el fraccionamiento disciplinar y traten de encontrar aspectos comunes en la multiplicidad de posicionamientos existente. Este desafío representa un claro trabajo transdisciplinar en el que la investigación y la acción se entrelazan para comprender el (o los) porqué del posicionamiento de los actores. En esta búsqueda, que se dificultó por la pandemia de Covid-19 pero que al mismo tiempo permitió experimentar con herramientas virtuales de indagación, resulta esencial dar la palabra a quienes permanecen al margen de los esquemas de decisión, respetando su consentimiento y consultando con la debida información sobre los alcances de las investigaciones.

Author: Gleiciane O. Pismel
Co-authors: Victor Marchezini, Liana O. Anderson, Galia Selaya, Yara de Paula e Eddie Mendoza
Title: Gobernanza de los incendios forestales en la frontera entre Brasil, Perú y Bolivia: capacidades y vulnerabilidades
SGP Project: MAP-Fire
Abstract: El estudio presenta un diagnóstico de las capacidades y vulnerabilidades de la gobernanza contra los incendios forestales en la región transfronteriza amazónica MAP (Madre de Dios-PE, Acre-BR y Pando-BO). Escenario de una rica biodiversidad y diversidad sociocultural, la región se enfrenta, desde las últimas décadas, a una gran presión sobre su cubierta vegetal y a un importante aumento de los incendios forestales y quemas, fenómeno que repercute negativamente en el ecosistema y en la sociedad local. Mediante un cuestionario online, la investigacion contó con la participación de 111 stakeholders de la región cuya percepción de la gobernanza local indica que su principal vulnerabilidad es institucional. Esto se debe principalmente a la falta de recursos humanos y financieros y a la influencia de las disputas políticas en la mayoría de las instituciones de gestión medioambiental. Asociado a las vulnerabilidades ambientales y socioculturales, también indicadas por los participantes en la investigación, tenemos una gobernanza con vulnerabilidades acumulativas. Por otro lado, la articulación a través de redes informales entre el Estado y sectores de la sociedad como la academia y las ONGs demostró ser una gran capacidad que a veces trasciende las fronteras.

Author: Cielo Risoli
Co-authors: Omar Defeo, Betina Lomovasky
Title: Life history patterns of the wedge clam Donax hanleyanus in sandy beach systems: Influence of coastal morphodynamics and ecological processes under climate change
SGP Project: Small-scale fisheries and marine ecosystem services: Adaptation and transformation to secure human wellbeing
Abstract: This research is part of an SGP project intended to increase the adaptive capacity of national management agencies and local fishing communities in Latin America to assure the sustainability of fishery resources as a way of living, and to protect biodiversity under climate change conditions. We focused our research on sandy beaches, which constitute narrow ecosystems that provide a wide range of services to humans. In this context, we evaluated populations of the wedge clam Donax hanleyanus, an intertidal bivalve distributed between Argentina and Brazil, considered potentially harvestable. We analyzed correlated biological features (age

and growth rate, productivity, mortality) with environmental variables (temperature, salinity, chlorophyll-a, coastal morphodynamics), at local (individual beaches) and regional (Argentina, Uruguay, and Brazil) scales. Between-beach differences in life history traits are mainly explained by salinity fluctuations, whereas a decrease in habitat quality explains low production and high mortality at the southernmost edge of its distribution. Our results have implications for strategic planning, fishery development, and management of a potentially valuable coastal resource.

Author: Mónica Clavijo- Romero
Co-authors: Andrés Fernandez Sam Ishak, Jaime Paredes, Héctor Turra & Ana Watson
Title: Critical TD approach to biodiversity conservation in the Americas
SGP Project: Incorporating Local and Traditional Knowledge Systems: New Insights for Ecosystem Services and Transdisciplinary Collaborations
Abstract: Transdisciplinary (TD) research is characterized as an integrative research approach that links paths of scientific innovation to societal problem solutions, accepts local contexts and uncertainty in knowledge production, developing pathways to solving socio-ecological issues (Jaeger-Erben et al., 2018). TD approaches have advanced a holistic understanding of socio-environmental conflicts from a participatory framework for science policy. Drawing on a critical transdisciplinary perspective, in this presentation we discuss the role of plurality and power within transdisciplinary frameworks and Latin American perspectives for biodiversity conservation and participatory decision-making. The presentation will begin with a theoretical perspective of critical transdisciplinarity to provide a framework for analyzing conservation initiatives in the Americas. Next, we will focus on the project's study cases: Uruguay, Colombia and Chile. Our TD empirical approximation contributes to unpack conservation as a system of relations where all knowledge systems and actors can actively participate in policy-making. Moreover, we discuss methodological recommendations and best practices in TD research: a focus on team building, conflict resolution and horizontal participation, developing membership cohesiveness and openness, and sustaining and advancing productive cooperation while applying findings to address real-world problems.

Author: Iván Barbero
Co-authors: Poca M, Dias Tadeu N, Giordano G, Trimble M, Pascual M, Jobbágy E.
Title: Provisión de agua y descarga de efluentes de las grandes ciudades de la Cuenca del Plata
SGP Project: GovernAgua.
Abstract: Las ciudades y sus territorios circundantes se encuentran interconectados mediante el agua de un modo frecuentemente desconocido. Estudiar los servicios ecosistémicos hídricos desde la demanda de las ciudades resulta valioso para evidenciar la relación entre las mismas y los ecosistemas acuáticos proveedores. Con el fin de representar espacialmente este vínculo para la Cuenca del Plata, construimos una base de datos con los puntos de toma de agua y descarga de efluentes, e información asociada, de 176 ciudades de Argentina, Bolivia, Brasil, Paraguay y Uruguay. Recurrimos a fuentes oficiales, medios periodísticos y artículos académicos, representando los datos en SIG. Resultados preliminares sugieren que, en promedio, la provisión de agua de las ciudades es 45% de agua superficial,

33% subterránea y 22% de ambas fuentes. Identificamos ciudades que descargan una alta concentración de efluentes a un mismo curso de agua, en muchos casos sin previo tratamiento, e.g. el Gran Asunción sobre el Río Paraguay. También ciudades que vierten efluentes aguas arriba de sus propios puntos de toma de agua, e.g. Piracicaba y Cuiabá sobre sus ríos homónimos. Esperamos brindar información valiosa de la relación entre las ciudades y los ecosistemas acuáticos que proveen servicios hidrológicos, aportando a una mejor gobernanza del agua.

Author: Gabriel Giordano
Title: Environmental education and water governance: reflections from a case study in Laguna del Sauce, Uruguay.
SGP Project: GovernAgua
Abstract: This presentation describes and reflects upon a research-action project on environmental education and water governance, carried out together with civil society organizations from the basin of the Laguna del Sauce lake. This lake is the main source of drinking water for Maldonado (Uruguay) and suffers from diffuse pollution and other environmental threats. The objective of the work was to strengthen environmental education and the participation of civil society in water governance. From October to December 2020, four workshops were facilitated with around 15 participants, using techniques to co-create knowledge, including topics such as local needs, purposes, experiences and priorities of environmental eductacion, networks and relationships between actors, water governance and participation, collective strategies on environmental education and water governance, and planning and implementation processes. As main results, a network of local civil society organizations was formed, new relations between civil society organizations were established and existing ones were strengthened. Finally, some of the agreements and actions generated between the organizations during and after the workshops are presented.

Author: Gabriela Jorge-Romero
Co-authors: Eleonora Celentano, Diego Lercari, Leonardo Ortega, Juan A. Licandro, Omar Defeo
Title: Long-term and multilevel impact assessment of the 2015–2016 El Niño on a sandy beach of the southwestern Atlantic
SGP Project: Small-scale Fisheries and Marine Ecosystem Services: Adaptation and Transformation to Secure Human Wellbeing
Abstract: As a land-sea interface, the fingerprints of climate perturbations may be immediately and profoundly felt in sandy beaches and the macroinvertebrates they harbour. In particular, extreme climatological events can result in long-lasting or irreversible ecological changes. This study assessed the main impacts prompted by the 2015–16 El Niño on a Southwestern Atlantic sandy beach ecosystem. A long-term (1982–2019) analysis was carried out, attending historical climate components and multilevel indicators of change across levels of ecological organization. The trophic networks of four ecosystem states were compared, and the macroinvertebrate community structure was analysed and deconstructed by taxonomy, beach zone occupied, feeding, and development modes. The potential recovery pathway of the system was also assessed. Climatic effects were reflected in a marked increase in sea surface temperature anomalies, rainfall, and in the

discharge of the widest estuary of the world (Río de la Plata). An abrupt disruption of ecological attributes was evidenced. After El Niño, the ecosystem shifted to a higher organization of the flow structure, a lower adaptive potential, and a marked increase in efficiency. The results highlight how extreme climatic events could prevent the recovery of a sandy beach ecosystem, as pulses may induce lag and legacy effects.

Author: Monique R S A Maia
Co-authors: Liana O. Anderson
Title: Scientific dissemination and communication in social media as a strategy to combat misinformation, wildfires, forest fires and climate change
SGP Project: MAP-Fire
Abstract: Scientific communication and dissemination has been undergoing rapid technological and linguistic changes. The interaction of scientific research results with society in an instantaneous way becomes more and more necessary. Currently, research institutions and projects have invested part of their efforts and budgets in the public dissemination of their activities through social networks. Social networks are currently a channel for information, updates and news for most Brazilians. Scientific communication on Social Media platforms is necessary in times of misinformation and dissemination of FAKENEWS. Concepts of: Design Thinking; Digital Marketing (Inbound and Outbound); Objective (1) act in the dissemination and scientific communication of the MAP-Fire Project via social networks (2) improve the strategy of fidelity, engagement and conquest of "disseminating follower" (3) implement Inbound and Outbound Marketing strategies.

Author: Yara de Paula
Co-authors: Liana O. Anderson
Title: Multiple actors: local actuation for global implications
SGP Project: MAP-Fire
Abstract: Depite understanding the inflamability scenario for this critical decade, it is still necessary to develop the effective strategies that can contribute to reducing future disasters and focus on providing countries with critical information when making important decisions to revent wildfire and forest fires prevention. The environmental education can be a great tool for this purpose, where the school community and other actors can be engaged to mitigate the risk and impact of fires. Thus, we prepared an activity guide for the Amazonic bioma reality and managed to envolve, during the covid pandemic, more than nine thousand students, 400 teachers and 65 governmental and no-governmental institutions in different countries, more effectively in the MAP region (Madre de Dios- Peru; Acre-Brazil; Pando-Bolivia). The knowledge through the proposed activities contributes to the prevention of socio-environmental and economic disasters associated with forest fires and fires at different scales (local, regional and global).