



OHMi PIMA COUNTY
Annual Seminar – 2 & 3 October 2024

October 2nd: Field Visits to Las Cienegas National Conservation Area, Sonoita, and Patagonia
October 3rd: Presentations, Marshall Building, 5th Floor Conference Room, 845 N. Park Ave, Tucson

For additional information please contact: Anne Sourdril (anne.sourdril@cnrs.fr) and Larry Fisher (lafisher@arizona.edu), co-directors OHMi Pima County, or Marie-Sophie Dumont (marie-sophie.dumont@cnrs.fr), program manager, IRL iGlobes

→ Wednesday, October 2nd: visits to some OHMi Pima County field sites

Departure 8:00 AM from the Marshall building

Morning: Visit to Las Cienegas National Conservation Area, hosted by the Cienegas Watershed Partnership, Pima County, and other partners

- 9:00 – Cienega Creek Nature Preserve (Julia Fonseca or Mead Mier)
- 9:40 – Rosemont Mine pullout (Rob Peters or Tom Nelson from Save the Scenic Santa Ritas).
- 10:30 – Cottonwood gallery/Empire Gulch (Riparian ecology/erosion) (Rodrigo Sierra-Corona from BRN or Jeff and/or Karen Simms).
- 11:30 – Sacaton flats (Veg. restoration & youth engagement) – Maya Tainatongo from the BRN board

Lunch at Empire Ranch provided by the OHMi (Panera)

Afternoon: visit to the Sonoita / Patagonia area, hosted by PARA and the FOSC

- 2:00 – Hermosa mine in Patagonia with PARA (Carolyn Shaffer)
-
- 3:30 – Sonoita Creek with Friends of Sonoita Creek (Robert Proctor)
- 4:30 – Paton Center for Hummingbirds with the Tucson Audubon Society (to be confirmed) and presentation of the Sonatas / BLUEBIRD projects (Anne Sourdril)

Evening dinner in Tucson at a local Mexican restaurant, hosted by OHMi Pima County



→ Thursday, October 3rd: Onsite presentations of current research programs within the OHMi Pima County

Marshall Building, University of Arizona, 5th floor Conference room and online, here:

<https://cnrs.zoom.us/j/99815059977?pwd=6q1dhp8CNFPayJhFDYW9cUnLIKVrt6.1>

9:00 - Introduction (Anne & Larry)

9:15 Debrief visits to CWP and FOSC

9:30 Brief summary presentation of approved grants to CWP and FOSC.

9:45 Vincent Robin (Université de Lorraine) et **Benjamin T. Wilder** (Next Generation Sonoran Desert Researchers), *Fire in the desert: The use of soil charcoal analysis to shed light on past fire regimes in arid/semi-arid ecosystems.*

10:15 Benjamin T. Wilder (Next Generation Sonoran Desert Researchers), **Michael Canva & Thierry Courcier** (Université de Sherbrooke), **Vincent Robin**, (Université de Lorraine), *Fire in the Sonoran Desert: An overview of recent advances and ongoing research.*

11:00 Break provided by the OHMi

11:15 Photodocumentary by **Anne-Lise Boyer** (University of Arizona), **Jean-Luc Minel** (University of Paris Nanterre) & **Béatrice Juanals** (Aix Marseille University), *Debating Drought and Its Solutions: Water Shortages in Arizona's Semi-Arid Climate (Photodocumentary screening).*

11:45 Katerina Dontstova et al (University of Arizona), *Evaluating potential for ground and surface water contamination from new and traditional munitions.*

12:30 Lunch provided by the OHMi

2:00 Adriana Zuniga & Larry Fisher (University of Arizona), *Stakeholder participation, indicators, assessment and decision making: Applying adaptive management at the watershed scale.*

2:30 Tomasz Tadeusz Włodarczyk & Alicja Babst-Kostecka (University of Arizona), *Plant Surveys at Legacy Mine Sites Are Shaping Phytoremediation Strategies in Arid Ecosystems.*

3:00 Sara Fraker & Jackie Glazier (University of Arizona), *Watershed Soundscape: A window into the creative process.*

3:45 Luc Barbaro et al (INRAE): *Soundscape fragmentation alters bird acoustic and cultural diversity in southern Arizona.*

4:15 Discussion, conclusion & perspectives



ABSTRACTS OF THE PRESENTATIONS

Title: Fire in the desert: The use of soil charcoal analysis to shed light on past fire regimes in arid/semi-arid ecosystems

Authors: V. Robin (Université de Lorraine) & B. Wilder (Next Generation Sonoran Desert Researchers)

Abstract: In the Sonoran Desert, fires regimes have changed from rare/infrequent and localized fires to moderate/high-frequency events at a landscape level. Such new fire regimes change ecosystem biodiversity and dynamics, and thus change how humans interact with the environment, meaning changes to socio-ecosystem trajectories. However, are these new fire regimes really new? In the Sonoran Desert, studies of ongoing and future fire regimes are based on the idea that past fires were absent or inconsequential to local ecosystems. However, this idea is only a hypothesis that remains to be tested. This is what we are doing in the Sonoran Desert based on soil charcoal data. Three sampling areas were selected in the valley of the Santa Cruz River. In each sampling area, one or two drainages were selected. In each, two sampling spots were localized (i.e. up and down along the drainage), mainly according the local topography, the type and thickness of soil sediment. In total, we sampled 10 spots, providing 29 samples of about 165 kg. After sieving these soil samples, we extracted charcoal records from most of the samples, showing great variability in soil charcoal concentrations. Here, we present the results of the charcoal taxonomical and chronological analyses to illustrate the potential of soil charcoal analyses to investigate past fire regimes in arid and semi-arid ecosystems worldwide.

Title: Fire in the Sonoran Desert: An overview of recent advances and ongoing research

Authors: Benjamin T. Wilder (Next Generation Sonoran Desert Researchers), Michael Canva, Thierry Courcier (University of Sherbrooke), Vincent Robin (Université de Lorraine)

Abstract: Fire is becoming a significant driver of ecological change in the Sonoran Desert as invasive grasses continue to expand their range across the region. Recent work has helped identify the state of fire in the desert at present and the close connection between wet winters and extreme fire seasons. Yet, key outstanding questions about the history of fire in the desert in the Holocene and the best strategies for restoration in burned desert areas remain. Two CNRS-supported projects aim to help address these gaps and provide important baselines for the past and future of fire in the desert.

Title: Debating Drought and Its Solutions: Water Shortages in Arizona's Semi-Arid Climate (Photodocumentary screening)

Authors: Anne-Lise Boyer (University of Arizona), Jean-Luc Minel (Université Paris Nanterre) & Brigitte Juanals (EJCAM Aix Marseille Université)

Abstract: This photo-documentary examines the critical issue of drought, intensified by climate change and human activities, and its impact on both human populations and ecosystems. In Pima County, Arizona, one of the hottest states in the US, it aims to inform and raise awareness about the effects of drought, social and technological responses, experimental solutions, and community involvement in ecological restoration.

Title: Evaluating potential for ground and surface water contamination from new and traditional munitions

Authors: Katerina Dontsova et al. (University of Arizona)

Abstract: The collaborative study between OHM Pima County and OHM Bitche County examines fate of new and traditional energetic compounds in the environment. It includes laboratory experiments investigating adsorption and transformation of 3-nitro-1,2,4-triazol-5-one (NTO), 2,4-dinitroanisole



(DNAN), and 1,3,5-hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in soils collected in Bitche in France and Fort Huachuca in US and modelling to predict their fate with changing climate in both locations.

Title: Stakeholder participation, indicators, assessment and decision making: Applying adaptive management at the watershed scale

Authors: Adriana Zuniga & Larry Fisher (University of Arizona)

Abstract: The management of landscapes and resources faces new and unprecedented challenges. Adaptive management has been identified as a natural resource management approach that allows practitioners to incorporate change and uncertainty into decision-making. However, its success relies on the collective monitoring of indicators, which is seldom studied. The purpose of this study is to examine the information tools needed for long-term monitoring of indicators through ongoing work in the Cienega Watershed in southern Arizona. Here, we outline some lessons learned that can be transferred to other cases and identify potential barriers to engagement and project success.

Title: Plant Surveys at Legacy Mine Sites Are Shaping Phytoremediation Strategies in Arid Ecosystems

Authors: Tomasz Tadeusz Włodarczyk & Alicja Babst-Kostecka (University of Arizona)

Abstract: Arizona faces widespread soil contamination as a result of extensive mining activities. Such rapid environmental changes challenge plants to respond and adapt to elevated levels of metals in the soil. Extensive plant surveys at legacy mine sites are required to identify the best adapted plant species, potential candidates for mining-impacted lands' remediation.

Title: Watershed Soundscape: A window into the creative process

Authors: Sara Fraker & Jackie Glazier (University of Arizona)

Abstract: We are a team of composers, artists, performers, and scientists creating a collection of artistic pieces around themes of stewardship and restoration in the Santa Cruz River Watershed. We'll share the current state of these works through sounds, images, and texts in progress. Sands and soils, plant materials, soundscape recordings, wet-dry mapping data, creek walks, acoustic instruments, musical electronics and prose poetry animate and inspire our ideas for community-building through eco-arts.

Title: Soundscape fragmentation alters bird acoustic and cultural diversity in southern Arizona

Author: Luc Barbaro (INRAE) *et al.*

Abstract: Long-term land use changes coupled with recent climate warming are expected to affect the highly original biodiversity of semi-desert, sky island forest and native grassland ecosystems of southern Arizona. We used passive acoustic monitoring and BirdNET identification algorithm to analyze the responses of acoustic bird communities to landscape-scale composition and configuration in 36 soundscapes recorded in winter and spring from 2018 to 2022. We further quantify bird cultural diversity and song attractiveness through new community metrics to point out the link between soundscape cultural importance and current land use changes in southern Arizona.