



Society of Ethnobiology 36th Annual Conference

Climate Change and Ethnobiology

May 15-18, 2013 University of North Texas

THINGS TO DO IN DENTON,

within walking distance from the UNT campus. Visit <http://.DiscoverDenton.com>

Historic Places and Museums- Walk to downtown Denton and learn about our town's history. All museum admissions are free!



Historic Court House Museum- Located in the historic 1896 Courthouse-on-the-Square, the museum is a unique repository of exhibits, special collections, and historical documents that provide

visitors with an overview of the communities and residents which have contributed to the county's rich heritage. Whether you are an out-of-town visitor or a life-long resident, you will be both educated and entertained as you immerse yourself in Denton County's days gone by. Location and Hours: 110 W. Hickory Street, M-F 8:00-4:00 pm.



Bayless-Selby House Museum- The walls of this Victorian style house museum tell the story of life in Denton at the turn-of-the-century. The story of Denton

County prior to 1908 is told through the music room with the E. Gabler & Bro. grand piano, the elegantly set dining room table, and the majesty of the Eastlake-style adult bedroom suite. From the moment visitors step on the garden grounds or the wrap around porch, the walls of the Bayless-Selby House museum begin their story.

Location and Hours: 317 West Mulberry Street, M-F 8:00-4:00 pm, S 11:00-3:00 pm.



Denton County African American Museum- The three rooms that make up this museum were once home to families who lived in the African American community of

Quakertown in Denton, Texas. The museum is now

home to artifacts that tell the stories of those families, and many more. The stories that will not be forgotten are told through photographs and information about many of the African American families from 1875, when they first came from Dallas seeking a better life.

Location and Hours: 317 West Mulberry Street, M-F 8:00-4:00 pm, S 11:00-3:00 pm.

University of North Texas Art Gallery houses several galleries. Through a focus on curatorial, student, and faculty projects involving vanguard contemporary art, the galleries challenge and promote the current discourse surrounding living artists and their works.



<http://gallery.unt.edu>. Location and Hours: 1201 West Mulberry Street, T-S 12:00-5:00 pm.

Food and Libations- There are numerous food and drink options to choose from in Denton. The most choices are concentrated on Fry Street near campus and Downtown. Refer to the restaurant guide for specific options.

Live Music- UNT alumni include music entertainers such as, Pat Boone and Meat Loaf. Denton's music scene tradition continues with live bands that can be seen on Fry Street or Downtown on the square. The Observer, available free at convenience stores and restaurants around campus, publishes venues, bands and times.

Shopping- Unfortunately, there are few large stores near campus but there are several convenience stores near campus, such as Eagle Stop Convenience Store (412 North Texas Blvd, 6:00-12:00 pm). Sack and Save (1500 N Interstate 35 E, 7-11 pm) is the closest grocery store near campus. It is a convenient place to pick up snacks and toiletries the TSA confiscated. Downtown has an eclectic ensemble of stores; which includes clothing (new and vintage), antiques, candy, recycled books and records.

THE CONFERENCE THEME

Anthropogenic climate change is a growing problem. Consensus among local and indigenous people confirms changes in climate patterns in diverse localities across the globe. The engagement between climate change and ethnobiology is not only upon us, but appears poised to be the most important research domain in the field moving forward. Important topics related to climate change are the theme of this year's conference.

ACKNOWLEDGMENTS

We are delighted to be hosting the 36th annual Ethnobiology Conference in Denton, Texas, at the University of North Texas. We invite you to explore the campus and Denton while you are here. UNT is the largest university in the DFW area, and it prides itself on its engaging mission of sustainability. Denton is recognized by several sources as one of the coolest small towns in America.

Every conference demands months of preparation, and we couldn't have done it without the help of many individuals and organizations. First, of course, we thank the University of North Texas for hosting our meeting in the Environmental Science Building. The Silvey Honor Society, the Department of Anthropology, the Department of Geography, and the Institute of Applied Science each supported aspects of the program. Diana Elrod of the UNT McNair Program and Brian Wheeler of the Elm Fork Education Center offered priceless support during all phases of conference organization starting during the summer of 2012. Diana simply knows how to organize large events, and Brian knows how to do everything else from bus driving to making lecture hall reservations. Tami Deaton in the Department of Geography helped with several purchases and van reservations.

Will McClatchey, Dave Reedy, and Keri McNew of the Botanical Research Institute of Texas are offering a free cider tasting workshop, and BRIT is hosting one of the Saturday field trips. Lisa Cole of the Lake Lewisville Environmental Learning Area helped organize the LLELA Saturday field trip. Jan Salick and James Kennedy organized the Friday Biocultural Collections workshop, and Marc Williams organized and is leading the Wednesday plant walk and mead making workshop. Marc Williams and James Veteto organized the Thursday lunchtime showing and discussion of "The Green Man." A special thanks to James Veteto for organizing the plenary session and keynote speaker.

Diana Elrod has organized the banquet and helped plan the reception, working around the logistical constraints of serving food on campus as well as seeking environmentally friendly and local products. David

Taylor has done the same with wines and beers. A special thank you to both of them. David Pierce of Mi Son Mi Son Mi Son arranged music for the banquet.

We owe an enormous debt of gratitude to Cheryl Takahashi, our webmaster. She made sure everyone had access to the most current information about the abstracts and events, and contributed immensely to keeping us all organized.

We acknowledge the volunteers who stepped up and helped us with the various niggling details that go into putting together an event. Please thank these volunteers at the book display table, the registration/information table, in the shuttle vans, and at the reception.

And finally, special thanks go out to Denise Glover, the outgoing Conference Coordinator for her work on this conference and on previous ones.

We hope you come away from this conference with some new friendships and ideas, and having reconnected with old friends. Thank you for sharing this time with us.

The organizing committee: Steve Wolverton, Denise Glover, David Taylor, Diana Elrod, James Veteto, Brian Wheeler, James Kennedy, Eric Simon, Amy Hoffman, Christy Winstead, and Jeff Mabe.

AWARD COMMITTEES

Poster award adjudication committee:

Carlos Coimbra
Nicholas Kawa
John (Mac) Marston

Barbara Lawrence Award adjudication committee:

Eugene Anderson
Karol Chandler-Ezell
Marsha Quinlan

OVERVIEW SCHEDULE

Thursday, 16 May 2013

Time	ENV 130	ENV 125	ENV 110	ENV Atrium
8:30	I. Welcome 8:30-8:45			POSTERS MUST BE SET UP BY 1:30
8:50	II. Climate Change and Ethnobiology			
11:30	Frank Cook, "The Green Man" (film) 12:30 showing	LUNCH		
1:00	III. Cognition, Perception, and Ethnobiology 1:00-2:00	IV. Interdisciplinary Approaches to Ethnobiology 1:00-2:00	V. Traditional Ecological Knowledge 1:00-2:00	
2:00	BREAK			
2:10	III. Cognition, Perception and Ethnobiology (cont'd.) 2:10-3:10	IV. Interdisciplinary Approaches to Ethnobiology (cont'd.) 2:10-2:50	V. Traditional Ecological Knowledge (cont'd.) 2:30-3:10	
3:10	BREAK 3:10-3:20	BREAK 2:50-3:20	BREAK 3:10-3:20	
3:20		IV. Interdisciplinary Approaches to Ethnobiology (cont'd.) 3:20-4:40	VI. Ethnomedicine and Healing 3:20-5:20	
4:00				VII. Poster Session 4:00-6:00

Friday, 17 May 2013

Time	ENV 130	ENV 125	ENV 110	ENV Atrium
8:00				REGISTRATION/Sales, Info 8:00-1:00
8:30	VIII. From Waste to Water to Wood: Challenges and Opportunities of Resource Management in a Changing Climate 8:30-9:50	XI. Comparative Landscape Ethnoecology: Changes in Space and Time 8:30-9:50	XIII. Human-Animal Interactions 8:30-9:50	
	BREAK 9:50-10:20	BREAK 9:50-10:00	BREAK 9:50-10:00	
	IX. Zooarchaeology 10:20-12:00	XI. Comparative Landscape Ethnoecology (cont'd.) 10:00-11:20	XIV. Fire Ecology and Ethnobiology 10:00-12:00	
12:00	LUNCH			
1:20	X. Environmental Philosophy and Biocultural Conservation 1:20-3:00	XII. Local Knowledge for Climate Change Adaption 1:20-2:40	XV. Paleoethnobiology: Humans and Environments in Time 1:20-2:40	
		BREAK 2:40-2:50		
		XII. Local Knowledge for Climate Change Adaption (cont'd.) 2:50-3:50	XV. Paleoethnobiology (cont'd.) 2:50-3:50	
4:30	Membership Meeting 4:30-6:00			Posters on Display until 5:30
6:30 to 9:00	Banquet	Denton Women's Club	610 Oakland St.	Pre-registered participants only.

ORAL PRESENTATIONS

Thursday, 16 May 2013

I. Welcome (ENV 130)

8:30-8:35 Steve Wolverton – University of North Texas

8:35-8:50 Art Goven – Dean, College of Arts and Sciences, University of North Texas

II. Climate Change and Ethnobiology (ENV 130)

Session Chair: James Veteto

8:50-9:20 Nabhan, Gary
Climate Change and Ethnobiology: Agrobiodiversity, Traditional Knowledge, and Community Process

9:20-9:40 McClatchey, Will and David Reedy
The Long-term Investment Strategy: Orchard Managers Observing and Reacting to Change

9:40-10:00 Salick, Jan
Himalayan Climate Change and Ethnobotany

10:00-10:20 Kawa, Nicholas C.
Climate Change and Crop Diversity: Manioc Varietal Management in the Rural Amazon

10:20-10:40 Skarbø, Kristine
Coping with Climate Change: Impacts and Adjustments in an Andean Agrarian Community

10:40-11:00 Maclin, Edward
Shifting Practices, Shifting Knowledge: Climate Change and the Conservation of Arctic Biodiversity in the World Wildlife Fund

11:00-11:20 Veteto, James and Stephen B. Carlson
Biocultural Diversity and the Political Ecology of Climate Change on Appalachian Orchards

11:30-1:00 LUNCH

III. Cognition, Perception, and Ethnobiology (ENV 130)

Session Chair: Justin Nolan

1:00-1:20 Ignace, Marianne and Ronald Ignace
Secwepemc Plant Talk: A View Beyond Taxonomy

1:20-1:40 McDonald, J. Andrew
Deciphering the Symbols and Symbolic Meaning of the Maya World Tree

1:40-2:00 Pierotti, Raymond
Constructal Law and Indigenous Insights into the Nature of Life

2:00-2:10 BREAK

- 2:10-2:30 Sarratt, Nicholas
Ecological Forms of Life: Wittgenstein and Ecolinguistics
- 2:30-2:50 Balee, William
Historical Ecology of Treeness
- 2:50-3:10 Anderson, E. N.
Concepts of "Nature" in Two Nonwestern Languages
- 3:10-3:20 BREAK

IV. Interdisciplinary Approaches to Ethnobiology (ENV 125)

Session Chairs: Steve Wolverton and Vaughn Bryant

- 1:00-1:20 Gosford, Robert
Birds, Native Title and Acculturated Landscapes in the Northern Territory of Australia
- 1:20-1:40 Kindscher, K., L. Castle, S. Leopold, and R. Craft
Ranking Tool for Medicinal Plants at Risk of Being Overharvested in the Wild
- 1:40-2:00 Lepofsky, Dana, Skye Augustine, Nathan Cardinal, Amy Groesbeck, Misha Puckett, Kirsten Rowell, Anne Salomon, Nicole Smith, and Elroy White
Ancient Mariculture in British Columbia: Documenting the Past for the Future
- 2:00-2:10 BREAK
- 2:10-2:30 Nagaoka, Lisa
The Pleistocene Extinction Debate and Cross-disciplinary Communication
- 2:30-2:50 Hofman, Courtney, Torben Rick, Paul Collins, Robert Fleischer, W. Chris Funk, Seth Newsome, Katherine Ralls, and Jesus Maldonado
Archaeogenomics and Conservation of the Endangered Island Fox
- 2:50-3:20 BREAK
- 3:20-3:40 Armstrong, Chelsey Geralda, Ian Puppe, Stephen Fratpietro, Neal Ferris, and Eldon Molto*
Ancient DNA in Archaeologically Charred *Zea mays*: Prospects and Limitations for Ethnobiologists
- 3:40-4:00 Willis, Staci
Applying Botanical Analyses to the Study of Ancient Shipwrecks, an Example from the Palynological Investigation of the Stella I Roman Era Laced Boat
- 4:00-4:20 Bryant, Vaughn
Forensics and Ethnobiology
- 4:20-4:40 Wolverton, Steve, Waquar Ahmed, and Justin Nolan
The Ethnobiological Perspective

V. Traditional Ecological Knowledge (ENV 110)

Session Chair: Rajan Rijal

- 1:00-1:20 Talberth, John and Susan Leopold
Reviving Dormant Ethnobotany: the Role of Women and Plant Knowledge in a Food Secure World

- 1:20-1:40 Bolfig, Christopher B.*
Cosmological and Natural Categories in Mvskoke Ritual and Medicine
- 1:40-2:10 BREAK
- 2:10-2:30 Katin, Nicole
Local Perceptions of Biodiversity among Rural Residents of Serra do Mar State Park, Southeastern Brazil
- 2:30-2:50 Wyllie de Echeverria, Victoria
Moolks (Pacific Crabapple, *Malus fusca*) on the North Coast of British Columbia: Knowledge and Meaning in Gitga'at Culture
- 2:50-3:10 Cain, Roger
Dihiya Unali—River Cane Our Friend—Cherokee Nation River Cane Initiative
- 3:10-3:20 BREAK

VI. Ethnomedicine and Healing (ENV 110)

Session Chair: Pankaj Jain

- 3:20-3:40 Devkar, Ranjitsinh V., Ravirajsinh N. Jadeja, Menaka C. Thounaojam, and A. V. Ramachandran
Investigation beyond validation of folklore claim of *Clerodendron glandulosum* Coleb., an ethnomedicine from North Eastern India
- 3:40-4:00 Ghanashyam, Niroula, and Nanda Bahadur Singh
Medical Ethnobiology and Indigenous Knowledge System of the Limbu People of Khejenim VDC, Taplejung, Nepal
- 4:00-4:20 Patil, D. A.
Traditional Herbal Formulations Used In Badwani District (Madhya Pradesh) India
- 4:20-4:40 Naser, Rafiuddin
Traditional uses of plants by some tribes of Marathwada region in Maharashtra (India) for the treatment of sexual impotency
- 4:40-5:00 Sharma, Manoranjan H., H Rajanikanta Sharma, and A. Radhapyari Devi
The Diversity of Leafy Vegetables used by the Meitei Community in Imphal East District of Manipur (India)
- 5:00-5:20 Khan, Shujaul Mulk, Habib Ahmad, Sue Page, and David Harper
Critically Endangered (CR) Endemic Plant Species of the Western Himalayas Used in Ethnomedicines

VII. Poster Session (ENV Atrium)

4:00-6:00

Allan, Elijah and Juliet Stromberg

Riparian ecosystem services: Akimel O'otham ethnomedicine use of plants in the Salt River, Phoenix, AZ

Babai, Dániel, Biró Éva, Bódis Judit, and Molnár Zsolt

Traditional knowledge of protected plant species in two Central-European landscapes

Baker, Janelle M., Fort McKay Berry Focus Group, and Wood Buffalo Environmental Association*

Eating Berries Near the Oilsands: Fort McKay's Observations on Quality and Quantity of Berries in their Traditional Territory

Beckham, Jessica, Sam Atkinson, Armin Mikler, and James Kennedy*
Utilization of urban green spaces by bumble bees (*Bombus* spp.) in North Texas

Burgos, Ariadna
Women, ecological knowledge and shellfish gathering in the mangrove of Katurai Bay (Siberut, Indonesia)

Castle, Lisa
At-Risk Tool as a Botanical Teaching Tool

Clark, Courtenay and Alain Cuerrier*
Inuit plant use in northeastern Canada: Comparative ethnobotany in Kangiqsualujuaq, Nunavik and Nain, Nunatsiavut

Classen, Zella and Lisa Castle
Using the At-Risk Tool to Assess the Vulnerability of Native Edible Plants to Over Harvest

Dhale, D. A. and D.A.Patil
Vernacular Plant Names in Maharashtra (India): In Ethnobiological Perspective

Façanha, Cristiane Lima, Carolina Joana da Silva, Gabriela Litre, Pedro da Silva Nogueira, Nilo Leal Sander, Patrícia Nápolis, and Joari Arruda*
Climatic changes perceptions by smallholders in the Brazilian Cerrado

Gellény, Krisztina, and Katalin Margóczy
Ecological re-interpretation of Medieval resource management regulations from Central Europe

Glenn, Ashley
How Sacred Seeds Supports Local Conservation and Education

Golob, Sarah, Francisco Santana Michel, Judith Ceballos Espinosa, and Bruce F. Benz
Legitimate Medicinal Plant Use In the Sierra de Manantlan Biosphere Reserve

Gracer, Allison, Amber VanDerwarker, and Gregory Wilson
Farming and Food Insecurity in the Mississippian Central Illinois River Valley: Metric Data on Maize Kernal & Cupules as a Means to Establish the Number and Types of Varieties

Guiza, Bridget and Stuart Pettygrove
The Effect of Dairy Manure Applications on Nitrogen Fixation by Alfalfa under Mediterranean Climate Conditions

Mabe, Jeffrey A., James H. Kennedy, Jaime Jimenez, and Ricardo Rozzi
Introduced Muskrats (*Ondatra zibethicus*) on Navarino Island, Cape Horn, Chile: Physical Signs, Habitat Associations, and Interactions with Introduced Beaver (*Castor canadensis*)

Margóczy, Katalin and Krisztina Gellény
Living knowledge of traditional resource management in a Hungarian landscape

Molnár, Krisztina, Zsolt Molnár, and Judit Bódis
Erosion of traditional ecological knowledge in Hungary, Central-Europe

Munim, Lauren
Home Gardens as Transported Landscapes: Ethnobotanical Encounters with Southeast Asian-American Horticulturists

Olson, Elizabeth A.

Creating a 'Living Stage' for Medicinal and Herbal Remedies: Field-course project in semi-rural northwestern Pennsylvania

Ortiz-Sánchez, Amanda, Columba Monroy-Ortiz, Angélica Romero-Manzanares, Mario Luna-Cavazos, Cristina Saldaña Fernández and Patricia Castillo-España

Plant use and management in homegardens from Tilzapotla, Morelos, Mexico

Quinlan, Marsha B. Sarah K. Council, and Jennifer W. Roulette

Children's Learning of Ethnobotanical Knowledge in a Rural Caribbean Village

Riggs, Casey

The Interactions and Implications of Fire, People, and El Niño in Trans-Pecos, Texas

Roskruge, Nick

The origin and movement of traditional Maori foods in New Zealand

Sander, Nilo, Joari Arruda, and Carolina Joana da Silva

Traditional ecological knowledge of *Palmae* by Quilombolas, Brazilian afro descendant people in Amazon forest, Brazil

Seward, Ariel and Lisa Castle

Climate Change and its Effects on the *Cyclanthera dissecta* Population near Weatherford, Oklahoma

Silva, Taline Cristina, Maria Franco Trindade Medeiros, Nivaldo Peroni, and Ulysses Paulino Albuquerque

Classification of cultural ecotopes in a Brazilian Cerrado Forest

Snively-Martinez, Amy

Household determinants of home garden presence in an indigenous Mexican community

Ulicsni, Viktor

Folk knowledge of invertebrate species in Central Europe

Umesh, Narta and Sarvesh K. Sood

Sacred Groves of Himachal Himalayas and their role in natural resource management in a changing environment

Walker, Ashlie and Lisa Castle

Preliminary Search for Biologically Active Secondary Metabolites from *Cyclanthera dissecta*

Winstead, Christy and Amy Hoffman*

Drought, Animal Resources and Ceremony: Comparative Analyses of Faunal Remains from Ancestral Puebloan Great Kivas

Zagarola, Jean-Paul and Christopher Anderson

A socio-ecological assessment of watershed ecosystem services in southern Patagonia

*Indicates a Barbara Lawrence Award submission

Friday, 17 May 2013

VIII. From Waste to Water to Wood: Challenges and Opportunities of Resource Management in a Changing Climate (ENV 130)

Session Chairs: Alexandra Ponette-González and Matthew Fry

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| 8:30-8:50 | Carpenter, Evan, and Steve Wolverton
Crossing the human-environment gradient: the geography and ecology of plastic pollution in streams |
| 8:50-9:10 | Deines, Dory
Identifying Terroir in Southwest Iowa Wineries |
| 9:10-9:30 | Presley, Alana
Global Benefits of Integrated Solid Waste Management |
| 9:30-9:50 | Simon, Eric
Mind the Gap: overcoming the language barrier in water resource management |
| 9:50-10:20 | BREAK |

IX. Zooarchaeology (ENV 130)

Session Chairs: Amy Hoffman and Jonathan Dombrosky

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|-------------|---|
| 10:20-10:40 | Hoffman, Amy, Laura Ellyson, and Christy Winstead*
Local Dietary Trends and Inter-site Connections in the Ancestral Pueblo Goodman Point Community, Southwestern Colorado |
| 10:40-11:00 | Burger, Rachel, Jenna Battillo, and Beryl Hellinghausen*
Prey Availability Reflected in Cut Mark Frequencies: An ethnoarchaeological test case from Aché assemblages |
| 11:00-11:20 | Eldridge, Kelly, Patrick Kinkade, and Christyann Darwent*
The Increased Role of Women and Children in Iñupiat Subsistence during the Little Ice Age: Zooarchaeological Analysis of a Prehistoric House at Cape Espenberg, Alaska |
| 11:20-11:40 | Szpak, Paul
Significant Others: Understanding Animal Lives in the Archaeological Record |
| 11:40-12:00 | Lupo, Karen and Dave Schmitt
Prey Depletion and the Zooarchaeological Record: Implications from Bofi and Aka Ethnoarchaeological Research |
| 12:00-1:20 | LUNCH |

X. Environmental Philosophy and Biocultural Conservation (ENV 130)

Session Chair: Alexandria Poole

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|-----------|---|
| 1:20-1:40 | Jain, Pankaj
Ethno-ecology of Bishnois and Swadhyayis |
| 1:40-2:00 | Poole, Alexandria K.
Epistemological Bridges in the Climate Change Debate: Responding with Biocultural Assessments for Environmental Justice |

- 2:00-2:20 Gao, Shan*
Eastern Philosophy Learns from the “Wild” South
- 2:20-2:40 Rijal, Rajan, Rana B. Chhetri, and Ricardo Rozzi
A Biocultural Approach to Understand How Community Forest Management Enhances Indigenous Peoples' Lives in the Context of the Mid-hills of Nepal
- 2:40-3:00 Contador, Tamara, Yanet Medina, Jaime Ojeda, Manuela Mendez, Kelli Moses, Paula Caballero, Francisca Massardo, Andres Mansilla, Lohengrin Cavieres, Eugene Hargrove, Jaime Jimenez, James Kennedy, Alexandria Poole, and Ricardo Rozzi
Field Environmental Philosophy: integrating ecological sciences and ethics into biocultural education and conservation
- 4:30-6:00 Membership Meeting

XI. Comparative Landscape Ethnoecology: Changes in Space and Time (ENV 125)

Session Chairs: Leslie Main Johnson and Zsolt Molnár

- 8:30-8:50 Varga, Anna and Zsolt Molnár
Semi-traditional ecological knowledge in Europe: the case of wood-pasture management in Hungary
- 8:50-9:10 Molnár, Zsolt
Perception and Management of Spatio-temporal Pasture Heterogeneity by Hungarian Herders
- 9:10-9:30 Babai, Daniel
Traditional direction of vegetation dynamics in the Eastern-Carpathians
- 9:30-9:50 Umopathy, Senthilkumar, R.K. Choudhary, M. Sanjappa, D. Narasimhan, R. Umashaanker, and G. Ravikanth*
Livelihood and Revenue: role of rattans among Mongoloid tribes and settlers of Andaman and Nicobar Islands, India
- 9:50-10:00 BREAK
- 10:00-10:20 Sehgal, Anju
Effect of Climate Change on Agriculture and Indigenous People: A Focus On Himachal Pradesh, India
- 10:20-10:40 da Silva, Carolina Joana, Pedro da Silva Nogueira, Jane Simoni, Cristiane Lima Façanha, Iris Gomes Viana, Elaine Maria Loureiro, and Djair Sergio Freitas Junior
Climatic changes perception on the flood pulse in the Pantanal wetland, Brazil
- 10:40-11:00 Cannon, Carrie Calisay
Kinship to the Canyon: Hualapai and Paiute Ancestral Ties to the Grand Canyon
- 11:00-11:20 Johnson, Leslie Main and Linda McDonald
Kaska Elders' Perception of Environmental Change
- 12:00-1:20 LUNCH

XII. Local Knowledge for Climate Change Adaption (ENV 125)

Session Chair: Kimberlee Chambers

- 1:20-1:40 Savo, Valentina and Dana Lepofsky
Traditional Ecological Knowledge and Climate Change: A review

- 1:40-2:00 Burgos, Ariadna
The potential role of fisherwomen on the monitoring and assessment of mangrove change (Siberut Island, Indonesia)
- 2:00-2:20 Fry, Matthew, Steve Wolverton, and Miguel Giardina
Frontier Processes, Climate Change, and Pueestero Culture in Western Argentina
- 2:20-2:40 Gill, Harneet, Trevor Lantz, and Sharon Snowshoe
A community-based approach to mapping local observations of environmental changes and climate change in the western Canadian Arctic
- 2:40-2:50 BREAK
- 2:50-3:10 Teshome, Awegechew, Sarah Paule Dalle, Zemedede Asefaw, Samson Gashu, Bayush Tsegaye, and Regassa Feyissa
Sorghum landrace diversity and farmers' selection criteria: twenty years of farmer-led innovation for livelihood security and climate change resilience, Ethiopia
- 3:10-3:30 Carlson, Colin J. and Joel D. Scheraga
Interfacing, not Integrating: Reshaping Government Approaches to Traditional Knowledge

XIII. Human-Animal Interactions (ENV 110)

Session Chair: Pankaj Jain

- 8:30-8:50 Pierotti, Raymond, Brandy Fogg, and Deborah Bird Rose
The World According to Is'a, Redux
- 8:50-9:10 Hull, Kerry and Rob Fergus
Ethno-Ornithological Research Among the Chontal Maya of Tabasco, Mexico
- 9:10-9:30 Chandler-Ezell, Karol, Catherine Chmidling, Cindy L. Pressley, and Lee Payne
Pet or Stray?: Ethnobiological Perceptions in Animal Control, Rescue, and Adoption
- 9:30-9:50 Chmidling, Catherine, Karol Chandler-Ezell, Cindy L. Pressley, and Lee Payne
Where is a Pet a Stray?: GIS-detection of gaps in animal control and welfare agencies in East Texas
- 9:50-10:00 BREAK

XIV. Fire Ecology and Ethnobiology (ENV 110)

Session Chair: Cynthia Fowler

- 10:00-10:20 Roos, Christopher I.
Climate Change, Society, and the Rise of the Mega-fires in the Southwest US
- 10:20-10:40 Dumez, Richard
Traditional Anthropogenic Fires in a National Park: When Local, Technical and Scientific Knowledge Hybridize (Cévennes, France)
- 10:40-11:00 Lecompte-Mastenbrook, Joyce
Restoration and risk: Federal-tribal collaborations and the reintroduction of anthropogenic fire in Coast Salish territories of Washington State
- 11:00-11:20 Welch, James R., Carlos E. A. Coimbra Jr., and Eduardo S. Brondizio

Vegetation change during four decades of management with fire by the Xavante Indians in Central Brazil

11:20-11:40 Gosford, Robert
Birds, Fire and Human Culture Australian Landscape

11:40-12:00 Sullivan, Alan
Re-thinking the Effects of Human-Controlled Ignitions on Ancient Economies and Modern Forest Health

12:00-1:20 LUNCH

XV. Paleoethnobiology: Humans and Environments in Time (ENV 110)

Session Chair: Jonathan Dombrosky

1:20-1:40 Szymanski, Ryan M.
Microbotanical Evidence for Pastoral and Agricultural Landscape Modification in Nyanza, Kenya

1:40-2:00 Emslie, Steven D. and Larry Coats
Climate change and the origin of split-twig figurines in Grand Canyon, Arizona

2:00-2:20 Mt. Pleasant, Jane
Using Maize Productivity Indices to Characterize and Compare Potential Maize Productivity Across Mississippian Sites

2:20-2:40 Gallagher, Daphne
Paleoethnobotany of Shea Butter (*Vitallaria paradoxa* Gaertn. f.)

2:40-2:50 BREAK

2:50-3:10 Marston, John M.
Agricultural Adaptation to Climate Change in Central Turkey, 1500 BCE – 500 CE

3:10-3:30 Scott Cummings, Linda
Climate and Agriculture: Managing Risk through Agricultural Strategies on the Anasazi Northern Periphery

3:30-3:50 Brown, Cecil H., Søren Wichmann, and David Beck
Colonists from Mesoamerica Brought Maize Agriculture to the U.S. Southeast in Prehistoric Times

*Indicates a Barbara Lawrence Award submission

ABSTRACTS

ALLAN, Elijah, School of Life Sciences, Arizona State University, Tempe, AZ, and Juliet Stromberg Ph.D., School of Life Sciences, Arizona State University, Tempe, AZ
Riparian ecosystem services: Akimel O’otham ethnobotany use of plants in the Salt River, Phoenix, AZ

Complimentary and Alternative Medicine (CAM) has increased nation wide. As major botany CAM clients, minority populations have increased in Phoenix, Arizona. The Salt River riparian zone has native and introduced plants, but management involves clearing the introduced. We asked whether the potential medicinal (ecosystem services) differ between native and introduced plants in the Salt River riparian zone? Medicinal uses (particularly from Akimel O’otham (AO) people) were queried from several databases and publications. Of 52 woody plants, 40 native and 12 introduced, 29 had a total of 162 CAM. 1 introduced plant had AO CAM, while the most CAM potential was an introduced species with 20 medicinal applications. We conclude that native and introduced woody plants in the Salt River do provide significant potential for CAM use. Consideration of the plants’ ethno functional roles could be used as a basis to determine whether or not to weed plants from restoration sites.

ANDERSON, E. N. University of California, Riverside
Concepts of "Nature" in Two Nonwestern Languages

Concepts of “nature” differ radically from culture to culture. Few, if any, nonwestern languages have the strong opposition between “nature” and “humans” that English has, and even English does have the phrase “human nature.” The nearest Chinese equivalent to “nature” is *xing* and a family of words derived from it, but this word really means inborn or innate qualities as opposed to acquired ones, so that “human nature” does not need any special marking—it is, in fact, the focal exemplar of *xing*. A quite different concept, *ye* “wild,” covers the wilderness as a dangerous place. Yucatec Maya has no concept of “nature” as separate from people, since the whole Maya environment was more or less managed by people. The Spanish words *natura* and *naturaleza* are borrowed. As in Chinese, there are words for inborn nature, such as *sihnal*, which literally means “what is inborn” (*siih*, to be born), and *ka’ah*, something basic and proper to a thing. These concepts and the philosophy behind them contrast with the English language words and concepts, and shape folk taxonomies as well as behavior toward the nonhuman world.

ARMSTRONG, Chelsey Geralda - University of Western Ontario, Ian Puppe - University of Western Ontario, Stephen Fratpietro - Lakehead Paleo-DNA Laboratory, Neal Ferris - University of Western Ontario, and Eldon Molto - University of Western Ontario
Ancient DNA in archaeologically charred *Zea mays*: prospects and limitations for ethnobiologists

Plant remains are an integral part of any archaeological investigation however; despite new developments in ancient genetics, research in *plant* ancient DNA (aDNA) is a relatively new and unexplored discipline. As a result, paleoethnobotanists, archaeologists and geneticists have not understood the feasibility and limitations of each others’ fields. For example, few seem aware that aDNA extraction from charred plant remains is rare and without any kind of standard or working protocol. Herein, the possibilities of retrieving aDNA from charred *Zea mays* are considered resolving the question of whether or not archaeologically charred plants are a viable source for genetic material. The confirmed positive results generate questions about the added-value of maize and how knowledge of genetic attributes can contribute to the growing field of ethnobiology, particularly through community based research projects and demonstrating the value of these findings as they pertain to the treatment of charred floral remains by archaeologists.

BABAI, Daniel
Traditional direction of vegetation dynamics in the Eastern-Carpathians

We investigated the traditional knowledge of vegetation dynamics in the Gyimes region (Eastern Carpathians, Romania). The study area is situated originally in the spruce-forest zone. It was changed in the last three centuries into a diverse landscape with forest patches and extended species-rich grasslands. We carried out our

research in a 2000 person community by participatory field work and semistructured interviews. The local community has a detailed knowledge and great deal of experience with natural environment-transformations. Clearcut-succession processes, grassland restoration are the most important elements of this knowledge. Locals distinguish 9-10 stages of clearcut succession with elaborated nomenclature. Noteworthy are also the efficient ways of grassland restoration (e.g. scattering of hayseed, oversowing with *Onobrychis viciifolia*). This knowledge is adequate for management of one of the most diverse landscapes in Europe.

BABAI, Dániel, Biró Éva, Bódis Judit, and Molnár Zsolt

Traditional knowledge of protected plant species in two Central-European landscapes

We compared two Hungarian ethnic groups' traditional ecological knowledge on protected plant species in a Hungarian hilly (Zala county, Hungary) and a Romanian mountainous landscape (Eastern Carpathians, Romania). We used structured questionnaires with color photos of 20 selected, protected species in both landscapes. 25-25 people were interviewed. Knowledge of the species' name, habitat, time of flowering, and population trends and the factors behind the changes in the size of population were collected. Local knowledge of protected plants was much less than expected, and it was not as elaborate as the previously documented knowledge of dominant and/or characteristic species. Furthermore local people rarely perceived changes in the abundance of the species. Our results suggest, that nature conservation will not be able to collect detailed knowledge on protected species, though local knowledge may increase the efficiency of communication between local people and conservationists.

BAKER, Janelle M., Fort McKay Berry Focus Group, and Wood Buffalo Environmental Association

Eating Berries Near the Oilsands: Fort McKay's Observations on Quality and Quantity of Berries in their Traditional Territory

Fort McKay is a Cree, Dené and Métis community located in northern Alberta, Canada that is surrounded by oil sands development. The Wood Buffalo Environmental Association (WBEA), a non-profit organization that monitors air quality and terrestrial ecosystems in the region, is supporting a community-led, TEK project on berry health in the region. This is a participatory approach that consisted of local community members and scientists working together to investigate the perception of community members on the potential impacts of oil sands development on berries, as a traditional source of livelihood. Fort McKay selected a group of traditional berry harvesters to visit and assess local berry patches. Together with WBEA, they designed a project where the Fort McKay berry group observes and monitors berry quality, expresses their concerns, and assesses indicators for berry health in their traditional territory. The berry group met with WBEA for a series of winter focus group meetings where they planned the project design and methods. During spring to fall 2012 the team picked berries and recorded observations and knowledge about the berry patches. The berry group verified the results in January 2013. We will present the results from this research.

BALEE, William Tulane University

Historical ecology of treeness

Ethnobiologists have argued for a heuristic dichotomy between *intellectualist* and *utilitarian* perspectives concerning traditional knowledge about biota visible to the naked eye. In comparing tree-name freelists obtained from two societies found in different hemispheres, pertaining to different linguistic phyla, and exhibiting distinct contact histories, neither perspective seems to explicate the bulk of the variation in the data. These two societies, namely, the *Jah Hët* (Aslian language family, peninsular Malaysia) and *Ka'apor* (Tupí-Guaraní language family, extreme eastern Amazonian Brazil), are nevertheless comparable in terms of environmental gradients, size of the language family they are in, and economy oriented, in part, toward the export of local products derived from the raw material of ambient organisms. Comparison of the tree-name freelist data suggests that both intellectualist and utilitarian criteria apply. Therefore, it may be time to revisit the debate, or even to supersede it with a more satisfactory explanatory framework.

BECKHAM, Jessica - University of North Texas, Sam Atkinson - University of North Texas, Armin Mikler

- University of North Texas, and James Kennedy - University of North Texas

Utilization of urban green spaces by bumble bees (*Bombus* spp.) in North Texas

Bumble bees (*Bombus* spp.) are adept pollinators of many cultivated and wild flowering plants, but many species have experienced declines in recent decades. Though urban sprawl has been implicated as a driving force of such losses, urban green spaces may serve as habitat islands for *Bombus* populations if managed appropriately. This research investigates how local and landscape-scale factors influence the utilization of urban green spaces in North Texas by bumble bees, including *B. pensylvanicus*, a species that is common locally, but experiencing national range reductions. Here we present preliminary results gathered from historic museum records in order to establish baseline data on *Bombus* species presence in the study area. The final results of this study will supply current data about North Texas *Bombus* populations in both natural reference sites and urban areas, as well as evaluate the potential of urban green spaces to aid in the conservation of these pollinators.

BOLFING, Christopher B. - University of Arkansas
Cosmological and Natural Categories in Mvskoke Ritual and Medicine

Any ethnoecological understanding of the world is necessarily shaped by the composition and organization of culturally constructed categories developed through time and sustained through direct and continued experiences within distinct social and natural environments. Drawing from data derived from the author's thesis fieldwork, this paper examines how the culturally implicit categories of *Mvskoke* peoples provide the cultural landscape upon which constructions of the self and one's comprehension of the world is understood, shared, and rendered meaningful. Specifically, this paper shows how cosmological, ecological, and social categories interpenetrate to influence how *Mvskoke* people derive meaning from ceremonial rituals and behaviors, including the significance of the making and taking of certain traditional medicines.

BROWN, Cecil H. -- Northern Illinois University, Søren Wichmann -- Max Planck Institute for Evolutionary Anthropology, and David Beck -- University of Alberta
Colonists from Mesoamerica Brought Maize Agriculture to the U.S. Southeast in Prehistoric Times

Maize agriculture was a relatively late introduction into the U.S. Southeast, established widely in the region only around 1000 years ago. From where it was introduced and by whom are unknowns. Speculation includes a U.S. Southwest origin and/or introduction from various parts of Latin America via water craft across the Caribbean or the Gulf of Mexico. New linguistic evidence indicates that a Mesoamerican people, who migrated to the Southeast probably from northeast Mexico, brought maize cultivation to the area. These were ancestors of modern Chitimacha people of southern Louisiana whose language is now extinct, but survives in textual materials and voice recordings. Application of the comparative method of historical linguistics shows that Chitimacha and languages of the Totonacan and Mixe-Zoquean families of Mesoamerica share a common ancestor, a proto-language whose homeland was located somewhere in Mesoamerica. Words for maize, 'to shell corn,' leached corn (nixtamal/hominy), and cornfield reconstruct for this ancestral tongue, terms that survived in 20th century Chitimacha (and, of course, also in modern Totonacan/Mixe-Zoquean languages). Chitimacha maize words are strikingly similar to maize terms from Caddo (Texas/Louisiana) and Catawba (Carolinas) languages suggesting that at least some Southeast groups acquired maize agriculture from Chitimacha speakers.

BRYANT, Vaughn - Texas A&M University
Forensics and Ethnobiology

Forensics pertains to the use of evidence in legal cases, both criminal and civil. Trace evidence association with crimes will often contain faunal and floral materials that can link individuals and other types of items to specific locations, such as a crime scene. Key individuals, trained in various aspects of ethnobiology, can apply their talents and knowledge to the field of forensic identification and geolocation. Pollen trapped on and in objects is one type of evidence. Currently, this type of application is playing a key role in anti-terrorism, identifying the source areas of illegal drugs and food products, finding the origin of illegal aliens, and assisting military efforts in foreign countries. As the world becomes a more complicated place the need for trained personnel able to work with faunal and flora evidence in forensic applications will increase and will provide opportunities for an expansion of grants, contracts, and employment.

BURGER, Rachel - Southern Methodist University, Jenna Batillo - Southern Methodist University, and Beryl Hellinghausen - Southern Methodist University

Prey Availability Reflected in Cut Mark Frequencies: An ethnoarchaeological test case from Aché assemblages

Zooarchaeologists often assume that changes in the frequencies of cut marks are a proxy indicator of prey availability. The assumption is that as animals become scarce, people spend more time intensively processing prey and that this is reflected by an increase in the number of cut marks present on bone. In this paper, we test this idea against a series of bone assemblages generated by contemporary Paraguayan Aché foragers in an area with marked prey depression adjacent (or 1 days walk) to long-term residential villages. We compare different measures of cut mark frequencies from a sample of prey bones from temporary camps generated during a 10-day forest trek to procure prey not normally accessible in close proximity to residential villages. We expect cut mark frequencies to intensify in response to variation in prey availability as a function of increasing distances between temporary camps and long-term residential villages.

BURGOS, Ariadna - Laboratory of « Éco-anthropologie et Ethnobiologie » UMR 7206-CNRS, Muséum National d'Histoire Naturelle, Paris

The potential role of fisherwomen on the monitoring and assessment of mangrove change (Siberut Island, Indonesia)

Linking local knowledge and global science in multi-scale assessments can be valuable for monitoring and comparing environmental changes. Mangroves ecosystems can be considered early warnings of larger regime shifts: past studies have shown that mangroves are so specialized that minor variations in their sedimentary, hydrological or tidal regimes causes noticeable mortality. On the other hand, people who depend on mangroves for daily subsistence have developed cumulative and complex bodies of knowledge—know-how, practices and representations—through a history of interactions, adaptations and reliance on this ecosystem. In Siberut (Indonesia), fisherwomen were found to have detailed ecological knowledge of the mangrove environment and accurate knowledge of mangrove resource locations and anthropogenic use. This corpus of socio-ecological knowledge allows local women to assess past conditions and survey their environment day-to-day. This paper will assess the potential of such local ecological knowledge for use in ecological and climate change monitoring initiatives in the mangrove forest.

BURGOS, Ariadna - Laboratory of « Éco-anthropologie et Ethnobiologie » UMR 7206-CNRS, Muséum National d'Histoire Naturelle, Paris

Women, ecological knowledge and shellfish gathering in the mangrove of Katurai Bay (Siberut, Indonesia)

The Mentawai communities located on the South-East side of Siberut Island (Indonesia) are highly dependent on the existing natural resources of the mangrove forest. Exclusively collected by women, shellfish is one of the most important sources of proteins for the local communities. The cumulative and complex bodies of knowledge of shellfish gathers include accurate knowledge of molluscs diversity, habitat and distribution, as well as, detail knowledge on mangrove dynamics: tidal regime, sedimentation and forest assemblages. According to the mollusc species and the tide, collecting techniques vary and imply different corporal movements and strategies. The purpose of this study was to characterize the knowledge of women gatherers regarding the ecology, distribution and collecting techniques of mangrove shellfish.

CAIN, Roger-University of Arkansas

Dihiya Unali--River Cane Our Friend--Cherokee Nation River Cane Initiative

Contemporary western Cherokee continue to demonstrate the practice of traditional ecological knowledge through a unique network of gathering and organizing spatial, temporal, and social frameworks of environmental knowledge systems specific to local flora and fauna found in northeastern Oklahoma. Recently, the Cherokee Nation of Oklahoma initiated a river cane conservation program by conducting on-going research with Cherokee Elders and Traditionalists, and the University of Arkansas' department of anthropology toward recording spatial distributions of canebrakes located on tribal land holdings through GIS mapping, gathering and organizing temporal indicators of environmental determiners, and re-evaluating and valuing the social perceptions and allocations of traditional Cherokee natural resource management as applied to river cane.

CANNON, Carrie Calisay

Kinship To the Canyon: Hualapai and Paiute Ancestral Ties to the Grand Canyon

This presentation explores the Hualapai and Paiute Tribe's unique ancestral and contemporary ties to the Grand Canyon, and focuses on each Tribe's natural and cultural resource monitoring efforts. The Hualapai Tribe's traditional lands encompass an extensive portion of the South Rim of the Grand Canyon, and the Reservation includes the western 108 miles of the Grand Canyon. The North Rim of the Grand Canyon is the traditional lands of the Southern Paiute people and are bounded by over 600 miles of the Colorado River from Kaiparowits Plateau in the north, to Blythe, California in the south. Both tribes are involved in extensive monitoring in the Grand Canyon centered on ethnobotanical resources, archeological sites, and Traditional Cultural Properties. Results derived from ongoing monitoring are utilized in part to provide management and policy decision making input regarding Grand Canyon and Colorado River resources through an adaptive management framework with other key stakeholders.

CARLSON, Colin J., and Joel D. Scheraga

Interfacing, not Integrating: Reshaping Government Approaches to Traditional Knowledge

It is widely acknowledged that the adaptive capacity and resilience of communities around the world can be strengthened through the application of the traditional knowledge and past experiences of indigenous people. However, a number of barriers have prevented the effective use of this knowledge. Perhaps the greatest impediment is that typical approaches to traditional knowledge have focused on "integrating" this knowledge into Western science, violating its integrity and reducing its value. Climate adaptation requires a participatory stakeholder-based approach that allows every party to make recommendations, rather than to amass their knowledge into one "database" that is processed by only one party. We describe an improved government approach to indigenous climate adaptation in which tribal holders of information can work side-by-side with western scientists to inform decision makers, rather than frameworks in which the insights gained from traditional knowledge are forced to adhere to the requirements of western scientific methods.

CARPENTER, Evan, and Steve Wolverton – University of North Texas

Crossing the human-environment gradient: the geography and ecology of plastic pollution in streams

Plastic deposition in hydrological systems is a pervasive problem at all geographic scales from loci of pollution to global ocean circulation. Much attention has been devoted to plastic deposition in marine contexts such as beaches and mid-oceanic gyres. Less is known about inputs of plastics into local hydrological systems, such as streams, where pollution can be prevented. A challenge to preventing such inputs resides in how people conceive of plastics *and* landscapes. A problem is that plastics are conceived of as short use-life disposable goods, yet their physical structure results in preservation on geological time scales. Archaeological concepts that encapsulate the temporal dimension of plastic preservation as well as the dichotomy of cultural systemic contexts and geological/archaeological contexts provide a stronger basis for assessing plastic deposition. That is, pollution exists in an ethnobiological context. We discuss that context and consider pilot data on plastic inputs into streams in Denton, Texas.

CASTLE, Lisa - Southwestern Oklahoma State University

At-Risk Tool as a Botanical Teaching Tool

Undergraduate students in three different plant science classes at two primarily undergraduate institutions scored wild-harvested medicinal herbs using the United Plant Saver's At-Risk Assessment Tool. Here I report on the goals, successes, and failures of scoring plants as a class assignment from educational and conservation perspectives, and offer suggestions for adapting the assignment for other class settings. The goals of this "authentic experience" assignment were to introduce students to medicinal plants and plant conservation efforts, reinforce botanical terminology, and increase data retrieval and sorting skills. Reflection responses from students suggest that the assignment succeeded over classroom exercises with similar educational objectives. Many students also reported frustration with hard-to-find and contradictory information and with the idea that the instructor could not tell them if they were correct. The resultant scores were in the same range as scores from experts, with in-progress documentation making the activity more useful educationally and for conservation.

CHANDLER-EZELL, Karol - Stephen F. Austin State University, Catherine Chmidling - University of Nebraska at Omaha, Cindy L. Pressley - Stephen F. Austin State University, and Lee Payne - Stephen F. Austin State University

Pet or Stray?: Ethnobiological Perceptions in Animal Control, Rescue, and Adoption

Perceptions of animals and their role in the social and ecological environment are crucial to the relationships and stewardship choices people form with them. Animal welfare and control agencies are focused on sustainability – the maintenance of healthy animal populations as well as health and safety of human populations. Interviews of 17 animal control agencies and 10 informal rescuers reveal that these goals can seem to contradict one another, with the same agencies responsible for pet rescues and care as well as seizure, spay/neuter programs, and euthanasia. How do people view the pets and agencies in this context? Animal rescue/control personnel, informal providers, society, and individual people all have conflicting taxonomies of the animals, with themes of “saving a life”, “rescuing”, and “helpless victims” emerging alongside “dangerous,” “broken,” and “diseased, mutts.” Well-meaning propaganda often re-enforces negative stereotypes and harms sustainability efforts.

CHMIDLING, Catherine - University of Nebraska at Omaha, Karol Chandler-Ezell - Stephen F. Austin State University, Cindy L. Pressley - Stephen F. Austin State University, and Lee Payne - Stephen F. Austin State University

Where is a Pet a Stray?: GIS-detection of gaps in animal control and welfare agencies in East Texas

What cultural and geographical factors cause an animal to be viewed as a pet or stray? Feral or victim? GIS mapping to assess geographic distribution of services and agencies in East Texas was paired with interviews of 17 animal control, welfare, and/or rescue agencies to identify gaps in the availability of control, rescue, and care. Mapping reveals gaps in availability of several services in many areas, particularly rural locations. Survey data compared to mapping of available resources, however, reveals that 1) available services are frequently not used, and 2) that perceptions of both the nature of the animals and the environment of animal control facilities prevent the public from using them. Folk views that pounds and shelters are “dismal and sad”, and for “broken, dirty mutts” prevents people from both surrendering and adopting those “strays” as future “pets.”

CLARK, Courtenay - Université de Montréal/Jardin botanique de Montréal, and Cuerrier, Alain - Université de Montréal/Jardin botanique de Montréal

Inuit plant use in northeastern Canada: Comparative ethnobotany in Kangiqsualujjuaq, Nunavik and Nain, Nunatsiavut

In northeastern Canada, plants are an important part of traditional Inuit life, being used for food, tea, medicine, fuel, construction, cleaning, etc.. Based on semi-directed interviews, we document and compare plant names and uses in Nain, Nunatsiavut and Kangiqsualujjuaq, Nunavik. Despite different dialects of Inuktitut and socioeconomic histories, plant names and uses were expected to be similar between communities. Both communities reported the same number of taxa, with equivalent proportions of vascular/non-vascular taxa, growth forms, use categories, and medicinal uses. Forty-three species were used in each community, for a total of 78 species from 39 families. Despite high overlap in species distributions, only 35% of non-vascular species and 56% of vascular species were used in both communities. Unique plant uses may reveal separate bodies of TEK or reflect a recent overall reduction of ethnobotanical knowledge in the Arctic. Reintegration of this knowledge could help inform culturally-appropriate climate change adaptation strategies.

CLASSEN, Zella - Southwestern Oklahoma State University, and Lisa Castle - Southwestern Oklahoma State University

Using the At-Risk Tool to Assess the Vulnerability of Native Edible Plants to Over Harvest

Five edible plant species native to the United States were scored using the United Plant Savers' At-Risk Tool to determine their vulnerability to over-harvest. The species chosen, Tomatillo *Physalis longifolia*, Persimmon *Diospyros virginiana*, Pawpaw *Asimina triloba*, Chokecherry *Prunus virginiana*, and Prairie Turnip, *Pediomelum esculentum* all have traditional uses as both food and medicine. These species have been the subject of recent investigations into their promising chemical compounds and medicinal properties. Scores from the At-Risk Tool

will help determine if wild harvest can be sustained if one of these species becomes the next “anti-cancer super-food”.

CONTADOR, Tamara - Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Institute of Ecology and Biodiversity-Chile, Yanet Medina - Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Institute of Ecology and Biodiversity-Chile, Jaime Ojeda - Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Institute of Ecology and Biodiversity-Chile, Manuela Mendez - Universidad de Concepcion, Sub-Antarctic Biocultural Conservation Program, Institute of Ecology and Biodiversity-Chile, Kelli Moses - University of North Texas, Sub-Antarctic Biocultural Conservation Program, Chile, Paula Cabellero - Institute of Ecology and Biodiversity-Chile, Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Chile, Francisca Massardo - Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Chile, Andres Mansilla - Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Institute of Ecology and Biodiversity-Chile, Lohengrin Cavieres - Universidad de Concepcion, Institute of Ecology and Biodiversity-Chile, Eugene Hargrove - University of North Texas, Sub-Antarctic Biocultural Conservation Program, Chile, Jaime Jimenez - University of North Texas, Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Chile, James Kennedy - University of North Texas, Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Chile, Alexandria Poole - University of North Texas, Sub-Antarctic Biocultural Conservation Program, Chile, and Ricardo Rozzi - University of North Texas, Universidad de Magallanes, Sub-Antarctic Biocultural Conservation Program, Institute of Ecology and Biodiversity-Chile
Field Environmental Philosophy: integrating ecological sciences and ethics into biocultural education and conservation

The Cape Horn Biosphere Reserve (CHBR), embedded within the sub-Antarctic ecorregion, represents a frontier towards globalization. Although it is considered one of 24 pristine areas in the world, it is not free from local and global threats. In this context, field biologists and philosophers associated to the Sub-Antarctic Biocultural Conservation Program and the Omora Ethnobotanical Park (OEP), have worked to describe the region's biodiversity, linking ecological and philosophical research. The OEP has implemented a methodology called “*Field Environmental Philosophy (FEP)*” which integrates ecological sciences and environmental ethics through a 4-step cycle. We practiced OEP's FEP to study the underperceived biodiversity of the CHBR by exploring its inhabitants, their habitats and habits. By following this methodology, we have witnessed transformative experiences by students, researchers, and other participants, who are able to translate their discoveries into ethical and responsible actions that stimulate, in turn, new questions and sustainable activities in the CHBR.

DA SILVA, Carolina Joana - Brazilian, Pedro da Silva Nogueira - Brazilian, Jane Simoni - Brazilian, Cristiane Lima Façanha - Brazilian, Iris Gomes Viana - Brazilian, Elaine Maria Loureiro - Brazilian, and Djair Sergio Freitas Junior - Brazilian
Climatic changes perception on the flood pulse in the Pantanal wetland, Brazil

The Pantanal Wetland is recognized as a World Natural Heritage, Ramsar Site and Brazilian Heritage by its biodiversity, cultural diversity and scenic beauty. This research analyzes the perception of 100 *pantaneiros*, peoples that lives in the Pantanal, distributed on seven traditional communities, about changes in the flood pulse. The following observations were registered: 87% observed that the rivers are more dry, 81% that the dry phase of the hydrologic year is lasting longer; 83,5% that the flood phase is shorter, 73,6% that the filling phase is delayed and 86% that the rising water is more early and more rapid. They attribute these changes to decreasing and displacement of precipitation. Besides the impact of these changes in the regulation of ecosystem services offered by Pantanal to the Paraguay – Parana hydrologic system; production, provision and cultural services, as food security, profit for fisherman and biodiversity are also threatened.

DEINES, Dory - University of North Texas
Identifying Terroir in Southwest Iowa Wineries

Terroir is a central component of viticulture. It is often described as an interactive ecosystem that relates the sensory attributes of wine, such as aroma and taste, to the place. Place combines landscape characteristics,

grapevine varieties, and local cultural attributes to create a unique identity. Thus terroir wines embody place characteristics in their sensory experience. Climate is a major component of terroir as it is an underlying control on where grape varieties can be successfully cultivated and impacts the quality of the grapes produced. Therefore climate change has the potential to dramatically affect terroir. In this paper, I use a case study of nascent terroir in southwestern Iowa to explore the relationship between climate change and viticulture. Results from a landscape GIS analysis were combined with interviews to show where changes in site suitability as well as potential changes in vine suitability might affect the area's terroir.

DEVKAR Ranjitsinh V. - Division of Phytotherapeutics and Metabolic Endocrinology, Department of Zoology, The M.S.University of Baroda.Vadodara, INDIA, Ravirajsinh N.Jadeja - Department of Medicine, University of Maryland School of Medicine, Baltimore, MD, Menaka C.Thounaojam - National Brain Research Centre, Gurgaon, Haryana, INDIA., and A. V. Ramachandran - Division of Phytotherapeutics and Metabolic Endocrinology, Department of Zoology, The M.S.University of Baroda, Vadodara, INDIA. Investigation beyond validation of folklore claim of *Clerodendron glandulosum* Coleb., an ethnomedicine from North Eastern India.

Clerodendron glandulosum Coleb., (CG; Family Verbenaceae) is endemic to the North Eastern states (NES) of India that is used as an ethnomedicine by apatani, nyishi, debru tribes and local populace. In our study, dosing of CG extract accounted for improved blood pressure, vascular reactivity and glucose clearance rate in fructose induced hypertensive rats thus validating the folklore claim of its anti-hypertensive property. Also, potent anti-oxidant, free radical scavenging and hepatoprotective potentials of CG extract prompted further studies. Lipid lowering and anti-obesity properties could be established in C57BL/6J mice model via down regulation of PPAR- γ and related genes. In conclusion, CG has multifaceted therapeutic potentials (many not reported) that probably accounts for the overall wellbeing of the local populace but altered rainfall pattern coupled with pressures of urbanization is a matter of serious concern for loss of floral diversity that is threatening endemic herbs in biodiversity hotspot of NES.

DHALE, D. A. SSVPS's L.K.DrP..Ghorey Science College, Dhule-424005 (India), and D.A.Patil SSVPS's L.K.DrP..Ghorey Science College, Dhule-424005 (India)
Vernacular Plant Names in Maharashtra (India): in Ethnobiological Perspective

It appears that ethnobiological study of vernacular plant names, which aids in revealing conceptual development in a human society, has largely remained neglected possibly due to more attention of botanists towards applied avenues of research. The present attempt to divulge bases of coining vernacular names in the State of Maharashtra (India) included interesting 30 vernacular plant names. These are founded on about 23 different criteria related to various plant features, human sentiments and observations. The authors appeals for conducting more research in this much neglected area of investigation.

DUMÉZ, Richard, Muséum national d'histoire naturelle (France)
Traditional Anthropogenic Fires in a National Park: When Local, Technical and Scientific Knowledge Hybridize (Cévennes, France).

In the French Cévennes National Park (dry Mediterranean mountains), cattle and sheep farmers use fire to maintain their pasture. Behind the paradox of traditional anthropogenic fires occurring in a protected area, a possible consensus emerges around the use of fire. Indeed, the services provided to local people are not necessarily harmful to the environment (biodiversity conservation, firefighting). In the field, farmers, park managers and local firefighters meet regularly and confront their knowledge and practices, creating favorable contexts for appearance of composite and hybrid knowledge. If this example allows to discuss the various services provided by anthropogenic fire (in its social and environmental dimensions), it also gives the opportunity to examine the importance of confrontation of local, technical and scientific knowledge and to question the role and place of anthropogenic fires - between prohibition, maintenance and (co-)evolution, and behind this the challenges of co-management - in a context of global change.

ELDRIDGE, Kelly - University of California Davis, Patrick Kinkade - University of California Davis, and Christyann Darwent - University of California Davis

The Increased Role of Women and Children in Iñupiat Subsistence during the Little Ice Age:
Zooarchaeological Analysis of a Prehistoric House at Cape Espenberg, Alaska

Faunal remains recovered from a prehistoric Iñupiat house (Feature 33, KTZ-088) at Cape Espenberg in northwest Alaska demonstrate the increasing importance of shellfish during the Little Ice Age. The subsistence traditions typically associated with this time period, described by archaeologists as the Late Western Thule culture, are specific to male gender roles, such as cooperative whale-hunting and the hunting of other large game. Shellfish, which ethnographic accounts suggest were primarily harvested by women and children, have never been reported from archaeological sites above the Arctic Circle. The current understanding of Thule culture ignores the contributions that women in particular made to dietary subsistence. Analysis indicates the use and storage of significant numbers of large gastropods (*Neptunea heros*) and bivalve mollusks (e.g., *Macoma* sp., *Siliqua* sp.). These results underscore the important roles women and children played in Late Western Thule culture as food providers in the Thule-Iñupiat subsistence economy.

EMSLIE, Steven D. - Department of Biology and Marine Biology, University of North Carolina-
Wilmington, and Coats, Larry - Department of Geography, University of Utah
Climate change and the origin of split-twigg figurines in Grand Canyon, Arizona

Hundreds of split-twigg figurines have been recovered from caves in Grand Canyon and are associated with a hunting ritual that dates from 4200 – 3100 ¹⁴C yrs before present (B.P.). The caves chosen for this ritual all contain Pleistocene remains of big game animals and presumably Archaic hunter-gatherers identified these sites as entrances to the Underworld. We examine the known chronology for these sites in Grand Canyon and postulate that the origin of this ritual is correlated with a period of rapid climate change that occurred on both global and regional scales beginning at 4200 B.P. Warmer and drier conditions at that time probably negatively affected productivity for big game species such as bighorn sheep (*Ovis canadensis*), deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*) and the caves became foci for a hunting ritual with figurines serving as an offering. This hypothesis can be tested with additional radiocarbon dates on figurines.

FAÇANHA, Cristiane Lima - Brazilian, Carolina Joana Da Silva - Brazilian, Gabriela Litre - Argentina,
Pedro da Silva Nogueira - Brazilian, Nilo Leal SANDER - Brazilian, Patrícia Nápolis - Brazilian, and Joari
ARRUDA - Brazilian

Climatic changes perceptions by smallholders in the Brazilian Cerrado

The Brazilian Cerrado covered originally 22% of the national territory, being considered a hotspot. Since the 1970's the Cerrado biome suffers from the conversion of its ecosystems into large scale agriculture and cattle ranching. The Cerrado occupies 40% of Mato Grosso state, an area of 903.366.192km²; 47 indigenous peoples, traditional communities and 124 thousand small family farmers inhabit the state. This research interviewed 100 smallholders to verify their knowledge about rainfall changes, its impacts and the adoption of agricultural practices in face of those changes. The results showed that 94% of them observed a decrease on rainfall and/or a temporal displacement with consequences such as loss of cattle, fields and agriculture production. Adaptations in the production system were made by 42% of the smallholders. The capacity of adaptation to climatic changes by these smallholders depends on their perception of environmental changes and the consequences of those on their life style.

FRY, Matthew, University of North Texas, Department of Geography, Wolverson, Steve, University of
North Texas, Department of Geography, and Giardina, Miguel, Museo de Historia Natural de San Rafael,
Mendoza, Argentina

Frontier Processes, Climate Change, and Puester Culture in Western Argentina

Climate variability has uneven effects on the land use and livelihood strategies of agriculturalists and rural resource users. As well, rural livelihoods are increasingly implicated in a suite of exogenous, transformative, and mobilizing geographies of globalization. Navigating these complexities is a challenge for cultural ecological and ethnographic scholarship. In this paper, we use Cronon et al's (1992) concept of 'frontier processes' as a unifying framework to analyze the various factors affecting western Argentina's *puestero* culture. *Puestero*'s are pastoralist herders and livestock ranchers who live on the western periphery of Argentina; they practice diverse stocking and land management techniques in a range of ecosystems. In addition to a prolonged drought event,

puesteros in southern Mendoza also contend with new lifestyle desires, out-migration, state-mandated conservation efforts, and property expansion. As occurred in the US west, these can best be understood in terms of species-shifting, market-making, land-taking, boundary-setting, state-forming, and self-shaping processes.

GALLAGHER, Daphne - University of Oregon

Paleoethnobotany of Shea Butter (*Vitellaria paradoxa* Gaertn. f.)

This paper presents recent research on the management and exploitation of shea trees (*Vitellaria paradoxa* Gaertn. f.) over the past 2000 years in western Burkina Faso, West Africa. While their primary product, shea butter, is a widely consumed cooking fat, shea trees are also valued for their medicinal properties and are considered a high quality firewood. Ethnographically, harvesting rights for shea trees are incorporated into land tenure systems in diverse ways and productive trees are almost always protected in agricultural fields. Drawing on the well-preserved archaeological and paleoethnobotanical record at the site of Kirikongo, this paper presents a long term perspective on the role of shea butter in the region, including the possible effects of intensive management on nut morphology.

GAO, Shan - University of North Texas

Eastern Philosophy Learns from the "Wild" South

In this paper, I will first explore the Chinese conception of nature and Western conception of wilderness. In terms of Chinese conception of nature, I will focus on the major school's Chinese philosophy (Confucianism, Daoism and Zen Buddhism) and its philosophical understanding and aesthetic appreciation of nature. Then I will examine how different philosophical understanding of nature and wilderness between China and the West affect the health of ecosystem and conservation practices between China and the West. Lastly, I will discuss how the China and the West can learn from each other in terms of their environmental values and ecological conservation.

GELLÉNY, Krisztina - Department of Ecology, Faculty of Science and Informatics of the University of Szeged, Hungary, and Katalin Margóczy - Department of Ecology, Faculty of Science and Informatics of the University of Szeged, Hungary

Ecological re-interpretation of Medieval resource management regulations from Central Europe

Traditional ecological knowledge connected to resource management is more and more often used in nature conservation - also in Europe. Medieval oral (and later written) laws and regulations of traditional resource management techniques of Hungarians living in Transylvania (Romania) have been collected by historians. We have re-evaluated these laws from an ecologist's perspective. Data published in four books (Imreh, I. "The self-regulating Transylvanian village", "Chronicle of Kászonszék", "Order in the Transylvanian village", "Remembering on our Transylvanian ancestors"; sum. 1626 pages) were sorted into tables based on the DPSIR framework (driving force, pressure, state, impact, response). Results show that 16th-century people aimed for the long-term sustainable use of resources, especially protecting timber, soil, and water. Some of these regulations survived till present and are used by villagers in landscape management (e.g. in pasture and forest commons). It is a big challenge for modern Europeans to learn and integrate these historical regulations in present resource management.

GHANASHYAM, Niroula - Managing Director in Geneva Global School, Kathmandu, Nepal, and Nanda Bahadur Singh - Professor at central Department of Zoology, Tribhuvan University, Kathmandu Nepal
Medical Ethnobiology and Indigenous Knowledge System of the Limbu People of Khejenim VDC, Taplejung, Nepal

The research work has been undertaken in Khejenim VDC of Taplejung District in eastern Nepal to document and explore the traditional indigenous knowledge and practices relating to the use of various plant and animal species for medicinal purposes among Limbus of the study area. The study was focused on the utilization pattern of plants and animals by the local people and the data was collected through interviews with key informants, including Dhami/Jhankri, elders of the community, local healers and local people. Analysis of the data has shown that Limbu people of the study area are enriched with traditional and indigenous knowledge on utilization of 64 plant species, with medicinal values belonging to 44 families and 61 genera, used for curing 38 different ailments. Similarly, 15 animal species with medicinal value belonging to 9 orders and 10 families were used to

remediate 12 different ailments. The most frequently treated ailments were gastro-intestinal problems, respiratory issues, respiratory tract infections, dermatological problems, cuts and wounds. Findings of the present research work have also been supported by similar work done by other researchers. At the same time people of the study area has shown their interest in the conservation and protection of plants and animal species for their sustainable use and values.

GILL, Harneet - University of Victoria, Trevor Lantz - University of Victoria, and Sharon Snowshoe - Gwich'in Social and Cultural Institute

A community-based approach to mapping local observations of environmental changes and climate change in the western Canadian Arctic

Environmental changes associated with climate change and other human impacts are already affecting indigenous communities in Canada's western Arctic, where the rate of temperature increase exceeds global averages. In the southern Mackenzie Delta Region, Gwich'in hunters, trappers, harvesters and berry pickers are in a unique position to observe changes and provide insights as they occur. In partnership with the Gwich'in Social and Cultural Institute, we are using participatory photography and video to map and monitor local observations of environmental conditions and changes. In this presentation, we describe a community-based approach that engages Gwich'in youth, land users and elders, and we present our online map database created using local and traditional ecological knowledge. This project aims to empower communities to respond to uncertainties associated with climate change. The web database serves as a record of environmental conditions and provides a way for community members to share their knowledge and concerns with decision makers, researchers, and other communities.

GLENN, Ashley - Sacred Seeds at the William L. Brown Center

How Sacred Seeds Supports Local Conservation and Education

Sacred Seeds is an international network of ethnobotanical sanctuaries preserving biodiversity and traditional knowledge. We accomplish this through gardens containing locally important plants of medicinal, ceremonial, food and craft value. The network is currently comprised of 25 programs in ten countries on four continents. This geographical and cultural diversity is reflected in each sanctuary's identity, goals and obstacles. Instead of asking gardens to conform to a global model, Sacred Seeds works within their capacity to promote ethnobotanical conservation. This flexibility is shown in our services to our sanctuaries. Each garden receives its own unique support, from research and botanical inventories in Madagascar and Costa Rica, to curriculum in coastal Peru, and simply bringing a new perspective to problem solving in the Andes. Above all, we bring to all gardens the access to a community of experts, and promotion of their successes worldwide.

GOLOB, Sarah - Biology - Texas Wesleyan University, Francisco Santana Michel - Departamento de Recursos Naturales, CUCSUR, Universidad de Guadalajara, Judith Ceballos Espinosa - Departamento de Recursos Naturales, CUCSUR, Universidad de Guadalajara, and Bruce F. Benz. - Biology - Texas Wesleyan University

Legitimate Medicinal Plant Use In the Sierra de Manantlan Biosphere Reserve

The Sierra de Manantlán Biosphere Reserve is a 140,000 ha protected natural area inhabited by subsistence agriculturalists located on the border of Jalisco and Colima, Mexico. Inhabitants use local plants for many purposes, specifically medicinal, firewood, construction, tools, forage, among others. The objective of the present study is to identify legitimate medicinal use of plants based on informant knowledge of the local flora and the diversity of the local flora Manantlán, Mexico. We anticipate legitimacy can be identified through corroboration of the informants' knowledge of plant use. First we identify medicinal plant families as those whose medicinal species richness is disproportionate to their floristic species richness. Second, we document shared agreement among informants about medicinal plants used to treat a variety of symptoms. Consensus among informant responses indicate legitimized use of the plant family, genus or species for medicinal uses. We quantify informant reports of use for all medicinal taxa and based on predicted species medicinal use relative to species number per family identify families with higher than expected utility applying a body system treatment prescription for comparison. The results indicate the top five most utilized plant families in Manantlan are the Compositae, Solanaceae, Leguminosae, Labiate, and Verbenaceae families.

GOSFORD, Robert - Darwin, Australia. Ethnoornithology Research & Study Group
Birds, Fire and Human Culture Australian Landscape

In this paper I will explore the relationship between birds and fire in the Australian mythical and physical landscape. There is a growing body of evidence to suggest that some species – particularly raptors - are active promoters of fire in the northern Australian savannah landscapes, using small fire-sticks and embers to spread fire throughout the open grass and woodlands of the semi-tropical north. There is also evidence of similar behaviour from other parts of the world, including Africa and the Americas. I will briefly examine the fire-bird mythology of the Yanyuwa people, an Aboriginal language group from the west coast of the Gulf of Carpentaria in the Northern Territory, with a specific example of the propagation of fire on a landscape scale by one species of raptor. This presentation concludes by speculating on the importance of this line of investigation. On one hand, “ornithogenic” landscape modification by fire would necessitate a re-evaluation of our knowledge of historic landscape processes. On the other hand, as an Australasian ‘myth’ states, it opens the possibility of fire manipulation by humans as a behavior learned from kites that could be comparable to weaving learned from spiders, flight based on birds, etc.

GOSFORD, Robert - Darwin, Australia. Ethnoornithology Research & Study Group
Birds, Native Title and Acculturated Landscapes in the Northern Territory of Australia

As part of an extensive program to establish the Native Title rights of Aboriginal people across the vast pastoral estate of the Top End of the Northern Territory, the Northern Land Council has commenced a number of Federal Court of Australia proceedings seeking confirmation of those rights and interests. I will briefly explain the Native Title legislative regime and its implications for Aboriginal claimants.

Preliminary factual investigation of the scope and nature of claims of the rights, interests and ownership of this vast estate required a mapping exercise that focuses on the relationships between people and known and identified sites. These sites can be single points (i.e. a traditional well, tree, hill or plain etc) or a connected chain of sites with a common property. These chains of sites are often referred to as “dreaming tracks” and can be localized within the estate of a local language group ranging up to trans-regional or –continental in scale and passing through many local clan and language group estates.

GRACER, Allison- University of California-Santa Barbara , Amber VanDerwarker- University of California-Santa Barbara, and Gregory Wilson- University of California-Santa Barbara
Farming and Food Insecurity in the Mississippian Central Illinois River Valley: Metric Data on Maize Kernels & Cupules as a Means to Establish the Number and Types of Varieties

Recent archaeobotanical data from sites spanning the Mississippian period in the CIRV reveal that maize production increased throughout this period. This research seeks to determine if production increases involved the introduction of new varieties of maize as a component of agricultural intensification. I present metric data on kernels and cupules from four sites dating A. D. 1100-1300. Preliminary data suggest that initial production increases (seen during the Eveland and Orendorf phases) were not accompanied by the adoption of additional varieties. I hypothesize that the data will show that it was not until the subsequent Larson phase that a new type of maize was introduced into the cropping cycle.

GUIZA, Bridget- Environmental Systems: Ecology and Earth Sciences , Senior , UC San Diego, and Stuart Pettygrove, PhD-UC Davis Department of Land, Air, and Water Resources
The Effect of Dairy Manure Fixation by Alfalfa Under Mediterranean Climate Conditions

Alfalfa is a legume with a perennial growth habit and deep root system. It is thought to protect surface and groundwater quality by taking up residual soil nitrogen in fields that have received excessive rates of fertilizers. The natural abundance stable isotope method was used to estimate biological nitrogen fixation by alfalfa growing in fields having a history of dairy manure/wastewater applications. This approach exploits the ^{15}N content of manure and manure-enriched soils, which typically is elevated above that of the atmosphere. Nitrogen content was determined on all samples by combustion and $^{15}\text{N}/^{14}\text{N}$ was determined by IRMS. We estimated the proportion of alfalfa N derived from the atmosphere (%Ndfa) from soil in manured and nonmanured fields. The manured/wastewater fields have an elevated ^{15}N content ranging from 1 to 5‰. The %Ndfa is lower in

manured/wastewater fields ranging from 20 to 75%, while in the non-manured fields the %Ndfa is significantly higher at about 95%.

HOFFMAN, Amy - University of North Texas, Laura Ellyson - University of North Texas, and Christy Winstead - University of North Texas

Local Dietary Trends and Inter-site Connections in the Ancestral Pueblo Goodman Point Community, Southwestern Colorado

The Ancestral Pueblo people had some of the largest pre-colonization population densities in the southwestern United States. Over time, increasing population density led to intense land use practices, in the context of several climatic shifts. These effects altered the way the Ancestral Pueblo people subsisted on the landscape and eventually led to the depopulation of the Four Corners region (circa A.D. 1300). Several recently excavated archaeological sites within the Goodman Point Community, spanning a long temporal occupation (A.D. 775-1280), contain thousands of animal remains. We examine the local spatiotemporal variability in faunal remains through the use of quantitative approaches (including nestedness and prey choice indices) and investigate if these local dietary patterns mirror larger regional trends. The close spatial proximity and long temporal resolution of these newly excavated sites allows us to increase our understanding of local dietary stress and inter-site connectivity.

HOFMAN, Courtney -University of Maryland and Smithsonian Institution, Torben Rick - Smithsonian Institution, Paul Collins - Santa Barbara Museum of Natural History, Robert Fleischer- Smithsonian Institution, W. Chris Funk - Colorado State University, Seth NEWSOME -University of New Mexico, Katherine Ralls - Smithsonian Institution, and Jesus Maldonado- Smithsonian Institution

Archaeogenomics and Conservation of the Endangered Island Fox

One of the greatest environmental impacts of ancient people was the introduction of both domestic and wild species to non-native habitats. Using ancient DNA and high throughput sequencing methods, we are investigating possible ancient human translocation of the endangered island fox (*Urocyon littoralis*) on California's Channel Islands. The Channel Islands contain some of the earliest human occupations in coastal North America at 13,000 cal BP and contained some of the most populous hunter-gather groups in the world with extensive trade networks between the islands and mainland. Our recent archaeogenomic results may support the introduction of island foxes by human translocation. Island foxes are endangered and recently underwent a population collapse followed by a successful captive breeding program. Examining historical patterns of genetic variation in the island fox using an archaeogenomic approach can serve as a model to improve knowledge of ancient translocations and inform future management decisions.

HULL, Kerry - Reitaku University, Japan, and Rob Fergus - Rowan University, New Jersey

Ethno-Ornithological Research Among the Chontal Maya of Tabasco, Mexico

The Chontal Maya, or *Yokot'an* as they call themselves and their language, occupy 17 municipalities in the state of Tabasco, Mexico. A majority of the 35,000 Chontal today speak Chontal Maya, part of the Western branch of Ch'olan languages. Knowledge of bird nomenclature, auguries associated with birds, and the role birds play in an ever-changing Chontal society are the topic of this paper. We detail the ways in which birds interact with humans in the daily life of the Chontal Maya. Based on our fieldwork, we summarize the analysis of our linguistic data relating to bird names in Chontal as well as ethno-ornithological data relevant to each bird. We discuss birds in relation to onomatopoeia, prognostication, sorcery, hunting, and medicine in Chontal society. Our findings indicate that due to their ability to foretell future events, birds play a vital role in all aspects of Chontal Maya daily life, though much of this is limited to the older generation. We also discuss the current trend toward monolingualism in Spanish and semi-bilingualism among the younger generation in the Chontal area as one of the major causes of an unfamiliarity with bird names and the roles played by birds in Chontal society among many youth today.

IGNACE, Marianne, and Ronald Ignace

Secwepemc Plant Talk: A view beyond taxonomy

Indigenous plant taxonomies of the North American Northwest, including the Interior of British Columbia, have received attention since the earlier work of Nancy Turner, and at least in passing, through subsequent publications, with further work in press or forthcoming. Following up on previous ethnobotanical and ethnobiological work, since the early 2000s, the authors have carried out further refined work on Secwepemc plant and animal terminologies and how people talk(ed) about plants in Secwepemctsin, the Shuswap language. These invite a re-thinking of earlier universal taxonomy-oriented work (e.g. Berlin 1992). In this presentation, we will reconsider how Secwepemc speakers describe plant and animal knowledge in connection to wider geo-ecological knowledge and systems. As we will show, in the Secwepemc case there are numerous principles at odds with Berlinian folk taxonomy paradigms, the latter privileging either/or categories, or narrowly constituted domains. Instead, we will consider a perspective that entails the notion that Secwepemc ethnobiological knowledge is part of a wider ontological and epistemological system that fuses physiological knowledge of species with observed knowledge and experience of behaviour, perceived physiological similarities, ecological indicator relations and "sign metonomies", observed human--plant-animal relationships, only part of which are economical. These, in turn are historically constituted and embedded in spiritual relationships, and, last not least, their poetic expressions in song, prayer and proverb. Of central concern to solving the issue of how people talk of plant and animal "species" as part of environmental discourse is research on not only "taxa" as noun words for plants and animals, but on a wider range of morphological and syntactic ways in which Secwepemc speakers in dialogue and narrative consider environment, plants and animals. In other words, we make a case for involving linguistic knowledge much beyond the lexicon of species in considering knowledge of environment, including plants and animals. This is what Secwepemc speakers refer to as *sucwemúlecwem* - knowledge of land as process, where "land" entails geological, geographic and geophysical relations, along with the observation, behaviour and movement of species. Ethnobiological knowledge thus exists as much in verbs and ways of doing and movement as in what comes across as nouns. We further briefly discuss how these findings relate to present and future pathways of researching ecological knowledge of indigenous peoples in other parts of the world.

JAIN, Pankaj

Ethno-ecology of Bishnois and Swadhyayis

The traditional grass-root Hindu rural groups and tribes such as Bishnois, Bhils and Swādhyāya continue to live the *dhārmic* way of life in the sense that for them Indic Traditions are part of their daily way of life and thus there is no such thing as "religion" in their lives as there is no separation of sacred from profane. Therefore, there is no such thing as environmentalism distinct and separate in their lives. Being dhārmic automatically makes them environmentalist without being conscious about it. If Bishnois are saving animals and trees from invaders, they are simply living their traditions not "protecting the environment" *per se*. If Bhils continue to practice their rituals in their Sacred Groves, it is their ancient tradition, not "saving the bio-diversity". If Swādhyāyis are building Vrikshamandir, they are simply expressing their devotion and reverence for all creation according to the teachings of Gitā, not "restoring the environment". The traditional, comparatively much less modernized Indian groups do not see religion, ecology and ethics as separate entities. In line with the etymological definition of dharma, their *duty, virtue, cosmic ecological order* and *spiritual* aspects of their lives are all intertwined just as Dharma in its various definitions and meanings includes *duty, virtue, cosmic ecological order* and *spiritual* aspects of lives.

JOHNSON, Leslie Main - Athabasca University, and Linda McDonald - Kaska Nation

Kaska Elders' Perception of Environmental Change

Vegetation change can be driven by recurrent disturbances, such as wild fire, landslips and avalanches which are recognized by Kaska. Other changes may be driven by climatic change and shifts in weather extremes. All Elders agreed the long periods of extreme cold they experienced in their youth no longer occur. Kaska Elders in the Southern Yukon have also been observing shifts in the timing of seasonal changes, the seasonal growth of plants and the fruiting of the berries in response to climate change, and in response to industrial activities. Elders noted an increase in the variability of the weather from year to year and season to season, making prediction of environmental conditions difficult. This variability also affects the animals. Diminishing song bird abundance was particularly noted, and may relate either to global climate change or to pervasive changes and loss of habitat in the environments where these birds winter.

KATIN, Nicole - Tulane University

Local Perceptions of Biodiversity among Rural Residents of Serra do Mar State Park, Southeastern Brazil

This case study assesses local perceptions of a conservation project focused on the PESH (Serra do Mar State Park) of southeastern Brazil. The park harbors among the largest remaining fragments of Atlantic Coastal Forest. Residents of Núcleo Itariru, a settlement center within the PESH, continue to utilize these forest fragments; the fragments supply food, medicine, and building materials to them. Drawing on participant observation and freelistings conducted among mostly small farmers and their families in Núcleo Itariru, human/landscape relationships are addressed in a temporal and spatial context. Despite variation among these residents, in terms of length of occupation in situ and their place of origin, evidence thus far indicates shared perceptions concerning the conservation project, and more specifically, the species in most vital need of protection. These perceptions in association with local environmental knowledge may be applicable to continuity of human society inside conservation areas elsewhere.

KHAN, Shujaul Mulk - Department of Botany Hazara University Mansehra Pakistan, Habib Ahmad - Department of Genetics Hazara University Mansehra Pakistan, Sue Page - Department of Geography University of Leicester, UK, and David Harper - Department of Biology University of Leicester, UK
Critically Endangered (CR) endemic plant species of the Western Himalayas used in ethnomedicines

Assessment of endemic plant species has always been the major area of conservation interest for the plant scientists. The relatively young Himalayas host significant number of endemic plant species most of which are endangered due to number of natural and anthropogenic pressures. The Western Himalaya is an important hot spot for endemism as it hosts about 300 endemic species. In the present study, abundance of each endemic species was measured in a western Himalayan Valley, the Naran Pakistan. 64 endemics were recorded from this valley. It was hypothesized that the conservation status of the endemic flora of the Western Himalayas is critical. The IUCN red list criteria at regional level were assigned to recorded 64 endemic species. Our finding showed that these species were in critical situation in our study area. Analyses showed that 18 of these species were critically endangered (CR) in the region. All of these 18 species are used as ethnomedicines in the traditional health system and are under tremendous anthropogenic pressure and needs immediate conservation measures. We found out that Four species are of global importance as listed on the CITES. Existence of these critical endemic species grown in such a fragile ecosystem indicates the species once destroyed are extremely difficult to be re-grown due to numbers of climatic and edaphic constraints. It is thus imperative to conserve the biodiversity and encourage the sustainable use of the services at species and habitats levels.

KINDSCHER, K., University of Kansas, Castle, L., Southwestern Oklahoma State University, Leopold, S. United Plant Savers, and Craft, R., University of Kansas
Ranking Tool for Medicinal Plants at Risk of Being Overharvested in the Wild

We developed an adaptable, transparent tool used to quantify and compare vulnerability to overharvest for wild collected medicinal plants and to create a list of the most threatened plants. The United Plant Savers is known for developing "The List" of medicinal plants at risk for overharvest (available at www.unitedplantsavers.org). Our new tool scores species according to their life history, the effects of harvest, their abundance and range, habitat, and demand. The resulting rankings, based on explicit criteria rather than expert opinion, will make it easier to discuss areas of vulnerability and set conservation priorities. We will discuss the tool and plants that are ranked as At-Risk, including difficult to score *Echinacea*, Peyote (*Lophophora williamsii*) and Slippery Elm (*Ulmus rubra*). Current scores are based on independent rankings from at least three experts in the field. The adaptable nature of the tool will allow for adjustments as more information is added.

LECOMPTE-MASTENBROOK, Joyce - University of Washington Department of Anthropology
Restoration and risk: Federal-tribal collaborations and the reintroduction of anthropogenic fire in Coast Salish territories of Washington State.

Mid-elevation meadows are prized by Coast Salish people for the suite of plant and animal resources that are associated with them. Historically, these people used fire to create or maintain these habitats. Most accessible mid-elevation meadows occur on public lands managed by the USFS, where it is commonly acknowledged that

fire suppression policies have resulted in conifer encroachment, and consequently, declining productivity of culturally important plant and animal resources. Coast Salish Tribes and the USFS have recently initiated a handful of collaborative projects designed to “enhance” these habitats. However, none have involved the use of prescribed burning. Instead they rely primarily on mechanical removal of encroaching trees. Is this a sustainable solution in terms of human and mechanical energy expended? From the perspective of those involved, are there particular reasons for the use of fire that aren't met through mechanical means? What are the perceived environmental and human health risks that have thus far prevented the reintroduction of fire on the land?

LEPOFSKY, Dana - Simon Fraser University, Skye Augustine- Parks Canada, Nathan Cardinal- Parks Canada, Amy Groesbeck- Simon Fraser University, Misha Puckett- Simon Fraser University, Kirsten Rowell- University of Washington, Anne Salomon- Simon Fraser University, Nicole Smith - Parks Canada, and Elroy White-Central Coast Archaeology

Ancient Mariculture in British Columbia: Documenting the Past for the Future

In coastal British Columbia, as elsewhere, the recognition and re-establishment of traditional mariculture practices are linked to issues of food security, health, economic development, governance, and community engagement in heritage. Our collaborative team of First Nations knowledge holders, archaeologists, and ecologists focuses on one form of traditional marine resource management. Locally known as “clam gardens”, these are hand-constructed rock walls and associated cleared and tended tidal sand flats. In several locations, we have 1) documented the location of clam gardens and associated archaeological sites; 2) conducted ecological surveys and experiments that suggest clam abundance, growth and survival are higher in extant clam gardens beaches than in other beaches; 3) collected zooarchaeological samples to assess ecological changes in ancient clam gardens; and 4) recorded local knowledge about the social and ecological aspects of traditional mariculture. Inter-disciplinary and inter-community efforts are an effective way to document traditional resource management systems, as well as situating them within current socio-political and ecological contexts.

LUPO, Karen - Department of Anthropology, SMU, and Dave SCHMITT - Desert Research Institute, UNR
Prey Depletion and the Zooarchaeological Record: Implications from Bofi and Aka Ethnoarchaeological Research

Changes in the abundances of certain animals in zooarchaeological assemblages are often viewed as indicators of prey depletion from anthropogenic causes or natural environmental change. Central assumptions in these analyses are that depletions of larger-bodied and higher value prey will lead to increased diet breadth and the inclusion of smaller-sized and lower value animals in the diet. In this paper, we use quantitative data derived from ethnoarchaeological studies of forest foragers to test these assumptions. By comparing prey harvesting rates and resulting zooarchaeological assemblages from 2 different villages, we show how anthropogenic effects (over-hunting and roads) influence hunting patterns and prey choice. Our analyses show that changes in hunting patterns resulting from prey depression generally match some of the traditional assumptions that guide zooarchaeological analyses but these data also show important deviations from expectations. Specifically, we find deviations in hunters prey selection resulting from a desire to maintaining social networks.

MABE, Jeffrey A. - University of North Texas, Denton, TX, James H. Kennedy - University of North Texas & Universidad de Magallanes, Punta Arenas, Chile, Jaime Jimenez - University of North Texas & Universidad de Magallanes, Punta Arenas, Chile, and Ricardo Rozzi - University of North Texas & Universidad de Magallanes, Punta Arenas, Chile

Introduced Muskrats (*Ondatra zibethicus*) on Navarino Island, Cape Horn, Chile: Physical Signs, Habitat Associations, and Interactions with Introduced Beaver (*Castor canadensis*)

Research on non-native species in the Cape Horn region of southern Chile has focused on the American mink and The American beaver, but ignored the muskrat. We surveyed freshwater habitats on Navarino Island, Cape Horn to identify physical signs of muskrat presence and to document muskrat habitat use. Muskrat presence/absence was compared with beaver altered habitat to determine if the ecosystem changes produced by beaver benefit muskrat. Latrines, tracks, and houses were the most common indicators of muskrat presence. Muskrat presence was associated with an increased abundance of aquatic vegetation, slow water velocity, and increased bank vegetation cover. Habitat conditions favored by muskrat tended to co-occur with habitat impacted by beaver and muskrat presence was strongly associated with beaver altered habitat. These results suggest a commensal

relationship where the ecosystem engineering activity of the introduced American beaver creates habitat more favorable to introduced muskrat in the Cape Horn region.

MARGÓCZI, Katalin - Department of Ecology, University of Szeged, Hungary and Krisztina Gellény - Department of Ecology, University of Szeged, Hungary

Living knowledge of traditional resource management in a Hungarian landscape

Large scale industrial agriculture rapidly wipes out traditional management practice and related knowledge. The mosaic landscape structure of the southern Kiskunság (Hungary) is not suitable for large monocultures, so the small scale, traditional agriculture survived until the seventies, and partially until present. Twenty-one in-depth semistructured interviews were conducted in 2011 and 2012 with local residents and land users about past and present resource management, land use, ecological knowledge, and ecosystem services. Interviewees spoke about a semi-subsistence economy until the seventies, the adaptive grassland management practice, the fine structured land use adapted to the mosaic soil properties. They argued, that this life is over, and only the use of machines and chemicals can make agriculture profitable, although they were sorry about this fact.

MARSTON, John M. - Boston University

Agricultural Adaptation to Climate Change in Central Turkey, 1500 BCE – 500 CE

How do people adapt agricultural systems to changing climates? Drier periods and periods of increased rainfall variability affect the availability of fodder for animals and the yields of agricultural staples, threatening human subsistence.

Archaeological data offer a unique perspective on how people responded to environmental change and whether those responses were successful over the long term. Prior archaeological research in central Turkey shows that agricultural systems changed in response to social factors, but the role of climate in these decisions has not been well studied.

This paper integrates 2000 years of paleoclimatic and archaeological data from central Turkey to ask how climate change affected rainfall and plant growth within this region and to ask how subsistence practices adapted to climate change. I also include an assessment of the environmental impacts of these practices and suggest that these data may prove useful in crafting future agricultural policies.

McDONALD, J. Andrew, The University of Texas - Pan American

Deciphering the Symbols and Symbolic Meaning of the Maya World Tree

Cosmic tree symbolism among pre-Columbian societies of Mesoamerica traces from the pre-Classic period, but the significance of the motif and its many and varied symbolic permutations are poorly understood. Efforts to identify the plant in a botanical context on ceramic vessels, stucco reliefs, and stone stelae of the lowland Maya usually favor a kapok tree (*Ceiba pentandra*) or maize plant (*Zea mays*). Nevertheless, a morphological and ecological evaluation of the motif favors a white-flowered water lily from the lowland swamps of southern Mexico and Central America: *Nymphaea ampla*. Recurrent associations between various gods and dynastic rulers with a personified aspect of the water lily world tree draws additional attention to the crucial symbolic and ritualistic roles this aquatic plant once played in the practice of religion and expression of kingship among lowland Maya communities.

MOLNÁR, Krisztina, Zsolt Molnár, and Judit BÓDIS

Erosion of traditional ecological knowledge in Hungary, Central-Europe

The goal of our research was to study the erosion of traditional ecological knowledge related to wild plant species. The survey was made among Hungarians in two semi-traditional villages (Sztána and Zsobok) in Transylvania, Romania. We studied the knowledge of three age groups, preferably in lineages (grandparents, parents and children) by semi-structured interviews. The set of species was randomly chosen from the total list of known wild plant species, adding randomly some dominant species that were not yet recorded as known by locals. Species were shown on pictures (after testing efficiency of recognition). Grandparents had a deeper, than expected knowledge. Our preliminary results suggest, that there are big differences between generations. The knowledge depended on people's age, type of work, hobby and connection to the settlement. We found, that the changing socio-economic environment resulted in a considerable loss of traditional knowledge.

MOLNÁR, Zsolt, MTA Centre for Ecological Research

Perception and Management of Spatio-temporal Pasture Heterogeneity by Hungarian Herders

Herders' perception, and management of spatial and temporal heterogeneity of pastures were studied. 78 herders living in the Hortobágy saline steppe, Hungary, were interviewed, and participatory observation was used to understand their plant and habitat knowledge and herding and habitat improvement techniques. Herders had a nuanced knowledge of the intra- and interannual variations of forage quality and quantity. They performed very strong herding. The daily spatial pattern of grazing was opportunistic and flexible, but had a more-or-less regular year-round cycle, in which marshes and stubbles provided forage in drought periods. Reciprocal learning and continuous communication between the herder and his animals determined grazing pattern. Herders improved different habitats in different ways. The main method was proper grazing supplemented by manuring, burning, removal of spiny weeds.

MT. PLEASANT, Jane

Using Maize Productivity Indices to Characterize and Compare Potential Maize Productivity Across Mississippian Sites

Maize productivity indices, used by the Natural Resources Conservation Service to distinguish soils across the United States based on their potential maize yields, were identified for soils within an 8 km-radius of 28 Mississippian sites/site complexes. Across all sites, 96,380 ha are classified as highly productive and 166,889 ha as moderately productive for maize. Productivity varied greatly across sites and site complexes, with the Cahokia Uplands having the largest amount of highly productive soils (27,336 ha). Moundville, in contrast, had no soils classified as highly productive. Productivity indices were higher in sites located in Illinois, Missouri, Indiana, and Kentucky and lower in states farther south: Tennessee, Arkansas, Alabama, and Mississippi. Both the quantity of highly productive soils and their unequal distribution have important implications for how we characterize and evaluate the role of maize in Mississippian communities.

MUNIM, Lauren

Home Gardens as Transported Landscapes: Ethnobotanical Encounters with Southeast Asian-American Horticulturists

This research examines the belief system, knowledge base and practice of Southeast Asian-Americans residing on the West coast of Florida. The importance of traditional ecological knowledge and home gardens as venues for cultural preservation for migrant horticulturists is illustrated. Data collection methods include: geospatial mapping, identification of key food and medicinal plant species, and ethnographic interviews. Home gardens serve as reconstructed landscapes for immigrant populations by stimulating cultural preservation of plants used in traditional healing, and providing a venue for the intergenerational transfer of traditional knowledge. Transported landscapes require traditional ecological knowledge regarding floral identification, uses, and cultivation practices. Home gardens not only provide sustenance, but are also a source of pride for migrants: most gardeners relate their botanical husbandry as expressions of self-worth. This study documents the cultivation of flora significant to this population, and seeks to demonstrate how home gardens help preserve cultural heritage and integrity.

NAGAOKA, Lisa - University of North Texas

The Pleistocene Extinction Debate and Cross-disciplinary Communication

Research areas that self-identify as inter-/multi-disciplinary have often targeted audiences that span several disciplines. However, communicating across disciplinary boundaries can be challenging. For example, research on the megafaunal extinction in North America, Australia and elsewhere has typically been the domain of archaeology and paleontology. Two hypotheses, anthropogenic versus climatic, dominate the literature and the ongoing debate. Within the past twenty years, however, other disciplines have taken an interest in these extinctions. In particular, ecologists promote overkill (human hunting) as the cause for the extinctions, using it as an example of catastrophic anthropogenic impacts. In this paper I examine how the misappropriation of the megafaunal extinction debate is likely related to the disciplinary culture of the consumers. Thus, researchers striving to exchange ideas beyond their traditional disciplinary borders should take an "anthropological" approach to communication if they want their research to be used appropriately.

NASER, Rafiuddin - Department of Botany, Maulana Azad College, Dr. Rafiq Zakaria Campus, Rauza Baug, Aurangabad.(M.S. India)

Traditional uses of plants by some tribes of Marathwada region in Maharashtra (India) for the treatment of sexual impotency.

Ethnobotanical study was carried out along with the traditional ethnic groups such as *Andh, Bhil, Pardhi and Thakar* communities in the Marathwada region of Maharashtra (India). During investigation, 23 plant species belonging to 19 families were identified. In present study more concentration is given to the treatment of sexual impotency. Sexual impotency is hidden problem among the rural and urban people. Tribal people have remedy with locally available forest wealth. In present study brief information about the plant or plant parts used by tribals living in the region were collected and documented with botanical name, local names, families and the mode of preparation of drugs and method of administration of dosage have been recorded. During study frequent visits to tribal area were organized, personal interviews, discussions and identification of plants with first hand information on ethnomedicinal preparations, dosage and their mode of administration was gathered from herbal practitioners of *Andh, Bhil, Thakar and Pardhi* communities. This type of ethnomedicinal survey appeared to be useful for the research on medicinal plants for the betterment of mankind.

NOGUEIRA, Pedro - UFRRJ, Carolina da Silva - Unemat, Carlos HENKE - UnB/Ecoa, Marcel Bursztyn - UnB/CDS, Cristiane Facanha - Unemat, Joaria Arruda - Unemat, Cely Franca - Unemat, and Douglas Rocha - UFMT -**UNABLE TO ATTEND**

Smallholders and Climate Change in the South Brazilian Amazon Rainforest: Perceptions, Trends and Challenges.

The Brazilian Amazon Rainforest comprises a high diversity of stakeholders, ranging from indigenous people to commodities farmers, and also smallholders. This region faces major social, environmental and economic challenges that may be intensified by climate change. The present research provides the perception of smallholders concerning changes in precipitation and temperature at the municipality of Matupa, Mato Grosso State, Brazil. The smallholder's perception respecting changes in precipitation was compared with pluviometric trends identified for the study area. Both analyses resulted on a rainfall reduction scenario, well as a delay in the beginning of the rainy season. Regarding temperature, there is a perception of change and higher temperatures. In this new climate scenario that has been designing for the region, drought events and consequently burnings appear as a challenge to smallholder's livestock and agriculture, their health and the ecosystem services provided by the forest.

OLSON, Elizabeth A. – Allegheny College

Creating a 'Living Stage' for Medicinal and Herbal Remedies: Field-course project in semi-rural northwestern Pennsylvania

This poster describes preliminary results of a field-course project that explored the incorporation of local plants and herbs as medicinal remedies in a small town in northwest Pennsylvania (Meadville). There were three primary research objectives: (1) survey the spectrum of health practitioners in Meadville; (2) identify locally sustainable medicinal plants to be grown in the Allegheny College campus farm; (3) develop a plan for making the medicinal use of plants and herbs more accessible to the Meadville community. Through the use of interdisciplinary and participatory-action-research methodologies, this project sought to promote knowledge of the sustainable use of herbal and plant based remedies in Meadville. The project departed from a top-down approach to knowledge creation and dissemination by using innovative methodologies incorporating ethnobotanical research techniques and theatrical performance. The field-course participants worked with community members to create a 'Living Stage' which sought to facilitate sustainable ways of understanding and using locally available medicinal remedies.

ORITZ-Sánchez Amanda, Monroy-Ortiz Columba, Romero-Manzanares Angélica, Luna-Cavazos Mario, Saldaña Fernández Cristina y Castillo-España Patricia

Plant use and management in homegardens from Tilzapotla, Morelos, Mexico

Homegardens strengthen the development of traditional activities. These gardens are essential for the food and income of the families. The purpose of this study was to determine the management and use of homegarden

plants for food and medicines in Tilzapotla, Morelos, Mexico. Of the 120 species recorded, 71% are used for food and 37.5% are used for medicine. Use of plants from homegardens represents a economy support for 63% to families. The practices of management have yielded crops for self-supply. Surpluses are dedicated to the sale and exchange. The variety of plants in homegardens was strongly influenced by the specific needs and preferences of the owners. Decisions to manage plants may be based on different reasons such as increase abundance, availability or enhance productivity. Thanks to homegardens, the families have free food and medicines available close to them.

PATIL, Prof. Dr. D. A.

Traditional Herbal Formulations Used In Badwani District(Madhya Pradesh) India

The present paper communicates the documentation of herbal formulations used for indigenous medicine by the tribal and rural people of Badwani district in India. It reveals 36 plant species belonging to 35 genera and 22 families of angiosperms and pteridophytes. About 45 reports form first use-report for India, whereas 05 species are being reported for the first time. These help combat as many as 45 human afflictions with a variety of formulations. The vernacular plant names ,scientific plant names ,family, type of recipes and doses, etc. are presented. This information may help reveal new or alternate sources of herbal drugs on critical scientific examination.

PIEROTTI, Raymond - Ecology and Evolutionary Biology, University of Kansas

Constructal Law and Indigenous Insights into the Nature of Life

Constructal Law was discovered in the 1990's by a Duke University Professor of Engineering. It may provide insights into numerous ecological and geological processes, and argues that for a finite-size flow system to persist in time (live) it must evolve in such a way that provides easiest access to the currents that flow through it. Thus, everything that moves and morphs in order to flow and persist is alive. This might explain why Indigenous cultures regard water, air, and even stone as being alive, while also negating the need to evoke random processes in the generation of structure and change, including Gould's idea that evolution is a random process. I will discuss these and other consequences of examining this law in both ontogenetic and macroevolutionary changes, including how endosymbiosis led to the origin of multicellular forms and the origin of hypertrophy in the human brain.

PIEROTTI, Raymond- Ecology and Evolutionary Biology, University of Kansas, Brandy Fogg -

Indigenous Studies, University of Kansas, and Deborah Bird Rose - Extinction Studies, McQuarie

University, Sydney, Australia

The World According to Is'a, Redux

Interesting convergences exist between Indigenous creation stories in different parts of the world, with regard to the role of wolves. Among Shoshonean peoples of the western United States, Wolf created a perfect world in which individuals were reincarnated after death and birth was painless. Her younger brother, Coyote, insisted that this would not work and that death must be permanent. Yarralin people of NW Australia have a similar story in which Dingo assumes the role of wolf and Moon assumes the trickster role. There are four possible explanations for the similarity between these stories: 1) Jungian archetypes involving Canids, 2) the stories have a common root, which would make this the oldest story known, 3) extensive cultural diffusion of stories; few places on earth are more distant than Australia and America's intermountain west, and 4) an extraordinary coincidence, which seems unlikely given similarity of details.

POOLE, Alexandria K. - University of North Texas

Epistemological Bridges in the Climate Change Debate: Responding with Biocultural Assessments for Environmental Justice

The existence and impacts of climate change remains controversial in the political arena of the United States despite the nation being the second significant contributor of global emissions and highest contributor per capita in the world. This paper explores the trend of "climate change denial" within groups that doubt climate change and contrasts this perspective to those who are experiencing climate change in the most extreme by highlighting the Indigenous Peoples' Biocultural Climate Change Assessment Initiative (IPCCA). The IPCC toolkit identifies

epistemological bridges to communicate the impacts of climate change and loss for indigenous communities, including: Self determination, Climate Justice, Food Sovereignty, Endogenous Development, Adaptation, Mitigation and *Buen Vivir*. This paper argues that the biocultural assessment methodology which focuses on the relationship between communities and their environment may aid individuals who otherwise deny or ignore climate change to become aware of their role in bringing about this imposing reality.

PRESLEY, Alana - University of North Texas & City of Denton Solid Waste and Recycling
Global Benefits of Integrated Solid Waste Management

Booming populations and rapidly growing urban areas generate massive amounts of municipal waste that contributes to greenhouse gas emissions, wasted natural resources, and pollution when not properly managed. Diverse cultures and economies produce different types of waste that effect the environment in different ways. As developing countries grow, their gross domestic product increases and the types of waste change. Global leaders at all levels should consider these changes and develop plans for a sustainable Integrated Solid Waste Management (ISWM) system that includes community education. A sustainable ISWM system can reduce the environmental impact of solid waste and create economy.

QUINLAN, Marsha B. - Washington State University, Department of Anthropology, Sarah K. Council - Washington State University, Department of Anthropology, and Jennifer W. Roulette - Washington State University, Department of Anthropology
Children's Learning of Ethnobotanical Knowledge in a Rural Caribbean Village

Caribbean horticulturalists learn a great deal of traditional ecological knowledge by early adulthood. This is the first study to examine ecological learning in relation to children's family environments. After identifying culturally salient plant species that village residents learn as youth, 50 children (ages 4-17) participated in a "plant walk" along a "staged" route containing 50 core local plants. Individual children's plant knowledge was assessed based on proper identification. Family, social and demographic data were also gathered for each child. As predicted, children who live in family compounds demonstrate more ethnobotanical knowledge than children whose neighbors are not close kin. Contrary to pre-dictions, father presence is not an indicator of children's ability to correctly identify plant species. Further, girls do not show greater levels of ethnobotanical knowledge compared to boys. Findings demonstrate that kin investment results in a marked increase in children's levels of ethnobotanical knowledge. This suggests that parental and alloparental dynamics may involve child investment according to inclusive kin fitness instead of direct fitness.

RIGGS, Casey - Texas A&M University
The Interactions and Implications of Fire, People, and El Niño in Trans-Pecos, Texas

Through the analysis of detrital charcoal from a sediment core retrieved from Diamond Y Ciénega in Trans-Pecos, Texas, macrocharcoal was utilized as a proxy of fire and El Niño-Southern Oscillation (ENSO) activity. Findings corroborate results from other studies that fire frequency and intensity is governed by ENSO activity within the region and that fire is required for desert grassland maintenance. Results demonstrate that mesic intervals with heightened ENSO activity and xeric periods of decreased ENSO activity correlate with changes in the archaeological record, specifically indigenous hunter-gatherer use versus non-use of locales far from reliable water sources. Once in the Historic era (A.D. 1700-Present), these climatic fire controls are overridden by human activities, specifically Euroamerican livestock overgrazing, which suppressed fires and transitioned the previous desert grasslands to the contemporary creosotebush (*Larrea tridentata*) shrubland.

RIJAL, Rajan - Department of Biological Sciences and Sub-Antarctic Biocultural Conservation Program, University of North Texas, Denton, TX, Rana B. Chhetri - Department of Biological and Environmental Science, Kathmandu University, Nepal, and Ricardo Rozzi - Department of Philosophy and Sub-Antarctic Biocultural Conservation Program, University of North Texas, Denton TX, Omora Ethnobotanical Park, Universidad de Magallanes, Puerto Williams, Chile
A Biocultural Approach to Understand How Community Forest Management Enhances Indigenous Peoples' Lives in the Context of the Mid-hills of Nepal

In 1978, the Nepalese government pioneered the introduction of a people-focused forest management approach, known as *Community Forests*. Charcoal is the major source of energy for the Blacksmith communities and its production depends on forest management. Our biocultural approach focuses on the interrelationships between the *habits* and *habitats* of the regional communities. A survey was conducted in the Karnel Community Forest to investigate how much charcoal Blacksmiths need to sustain their metal-crafting occupation, which represents their central habit. This habit, however, depends on conservation of forest habitat. In this study we evaluate how tree health affects production of charcoal. We compared the yield derived from healthy and unhealthy (also known as “3D,” Diseased, Decayed, and Dried) trees. Interestingly, we found no significant difference between charcoal production rates of 3D and healthy trees. This result encourages local community members to harvest 3D trees, a habit that benefits both the forest and the human communities.

ROOS, Christopher I.

Climate Change, Society, and the Rise of the Mega-fires in the Southwest US

Southwestern megafires are alternately described as a bellwether of Global Warming or a cautionary tale of human mismanagement of ecosystems. Historical ecological analysis, however, implicates both land-use and climate change in the rise of the megafires. Recent research suggests that human-fire-climate couplings need not necessarily produce such runaway positive feedbacks. Interdisciplinary archaeological, ethnographic, paleoecological, and simulation projects explore the role of human activities in ignition and fuel patterns that can enhance or suppress climate-driven feedbacks in these fire prone forests.

ROSKRUGE, Nick, Massey University, Palmerston North, New Zealand

The origin and movement of traditional Maori foods in New Zealand

Maori are the indigenous people in New Zealand in the South Pacific. Sweet potato (*Ipomoea batatas*) and potato (*Solanum* spp.) are both traditional foods for Maori and provide the base carbohydrate content in their diet. Both crops originate in the Andean region of the South American continent and are believed to have made their way across the ocean centuries ago as cargo with human movement, and possibly following tides and currents in the Pacific Ocean. Of interest is their establishment in a new climate zone where new management techniques were developed by Maori to ensure their continued availability and contribution to their survival as a people. In particular, sweetpotato is traditionally grown in subtropical climates but was adapted through storage and manipulation to seasonal production systems in a temperate and capricious climate. These systems have been refined over the last 500 years to ensure crop success in the 21st century.

SANDER, Nilo, Joari Arruda, and Carolina Joana da Silva

Traditional ecological knowledge of Palmae by Quilombolas, brazilian afro descendant people in Amazon forest, Brazil

The Amazon forest are habitat for 147 Palmae species, that are used or have potential for many use by indigenous people, traditional communities and quilombolas. This research studied the traditional ecological knowledge and use of Palmae species by quilombolas in the Vila Bela da Santissima Trindade Municipality, Mato Grosso State, frontier zone between Amazon Forest and Brazilian Cerrado. The methods used in this study were snow ball and free listing. The afro descendants know 18 Palmae species, with the follow frequency of citation: *Attalea speciosa* Mart.ex Spreng (100%), *Euterpe precatoria* Mart. (94%),*Acrocomia aculeata* (Jacq) Lodd. ex Mart. (81%), *Attalea phalerata* Mart. ex Spreng. and *Mauritia flexuosa* L.F. (78%) and *Astrocaryum huaimi* Mart.(75%). The interviewed used 17 species, for food (61%),handcraft (50%), building house (44%),fertilizers (11%). The use of these species can be an economic alternative complementary to cattle ranching, in such way to connect them to a regional market.

SARRATT, Nicholas - University of North Texas

Ecological Forms of Life: Wittgenstein and Ecolinguistics

The present philosophical literature on philosopher Ludwig Wittgenstein tends to either stagnate by focusing upon issues particular to Wittgenstein’s philosophy or expand the boundaries of Wittgenstein’s thought to shed light onto other areas of study. One area that has largely been ignored is the realm of environmental philosophy.

I prepare the way for a solution to this by first arguing that Wittgenstein's later philosophy of language shows 'proto-ecolinguistic' concerns, sharing much in common with the ecolinguistic thought of both Peter Mühlhäusler and Luisa Maffi. This reading, as well as the work of Mühlhäusler and Maffi, is a starting point for an opposition to a common trend in much of contemporary linguistics of adhering to a linguistic paradigm of universalizing linguistic atomism that gives an impoverished account of language. This impoverished account is argued to have potential environmental and ecological consequences which the universalizing atomistic paradigm is ill-equipped to address.

SAVO, Valentina - Hakai Network for Coastal People, Ecosystems and Management, Simon Fraser University, 8888 University Drive, Burnaby BC V5A 1S6, Canada, and Lepofsky, Dana - Department of Archeology, Simon Fraser University, 8888 University Drive, Burnaby BC V5A 1S6, Canada
Traditional Ecological Knowledge and Climate Change: A review

Climate change is a global issue with local, but significant, effects on ecosystems. Many local communities around the world are observing these effects and developing adaptation strategies. We conducted a literature review of the observations of and adaptations to climate change (and environmental changes recognized to be climate-driven) by traditional peoples worldwide. Observations include changes in weather or seasonality and spatio-temporal shifts in animal and plants. These changes undermine livelihood but also cultural values of communities. Long-term observations and Traditional Ecological Knowledge (TEK) affect the resilience of communities and their ability to adapt to change. While there is widespread recognition of the value of integrating TEK and western scientific knowledge in policy or conservation, there are few documented examples of successful integration. We believe that scientific and traditional ecological knowledge can be combined for a better understanding of climate change and its effects.

SCOTT CUMMINGS, Linda - PaleoResearch Institute
Climate and Agriculture: Managing Risk through Agricultural Strategies on the Anasazi Northern Periphery

Current global warming has heightened our awareness of climate change and its effects. Adaptation to climate change has been replayed on the landscape for millenia. Modeling past climate assists in understanding application of strategies necessary to cope with that change. The Anasazi Northern Periphery was occupied by agriculturalists who enjoyed success during the Medieval Warm Period, another period of global warming. The archaeological record for this area indicates changes in settlement pattern. A conglomerate of pollen and dendrochronological records and climate models may be compared with the archaeological record of settlement and mobility to better understand local response to the risks of changing climate. In an area where both temperature and precipitation may impose constraints, agricultural fields must be well situated to take advantage of differing environmental conditions. During warmer, wetter periods, agriculture and people flourished. However, cooling and/or drought meant challenges, adaptation, and sometimes abandonment of their homeland.

SEHGAL, Anju Batta Himachal Pradesh University, Associate Professor in Government Post-Graduate College Hamirpur, Himachal Pradesh, India.
Effect of Climate Change on Agriculture and Indigenous People-A Focus On Himachal Pradesh, India.

Climate change is a major challenge in terms of agriculture, food security and rural livelihood for thousands of people especially the poor in Himachal, which falls in North-Western Himalayas. Agriculture contributes over 45 per cent to net state domestic product. It is the main source of income and employment. Over 93 per cent of population is dependent on agriculture which provides direct employment to 71 percent of its people. Area of operation holding is about 9,79 lakh hectares owned by 9.14 lakh farmers. About 80 per cent area is rain fed and farmers depend on weather gods for rains Region is home of diverse ethnic communities having enormous socio-economic and cultural diversities, gifted with range of farming systems and rich resource wealth, including biodiversity, hot spots and ecosystems sustaining million of people living in the region. But growing demands of ecosystem goods and services are posing threats to natural resources.

SEWARD, Ariel - Southwestern Oklahoma State Univeristy, and Lisa Castle - Southwestern Oklahoma State Univeristy

Climate Change and its Effects on the *Cyclanthera dissecta* Population near Weatherford, Oklahoma

Cyclanthera dissecta (Cucurbitaceae) is a weedy annual vine native to western Oklahoma. This species has been poorly studied, but is closely related to medicinal and edible species, including *Cyclanthera pedata* and agricultural weeds. We have tracked changes in a population of *Cyclanthera dissecta* near Weatherford, Oklahoma for over three years in order to determine baseline population size and effects of unusual weather conditions on this plant. There is not much research to look to, but we hope to learn about the effects of drought in southwestern Oklahoma. The horrid drought in this area caused a sharp decline in plant life in 2011 compared to 2010, and has made a comeback in 2012. These initial results provide a glimpse at the effects of climate change on plant populations in southwestern Oklahoma and will allow us to further investigate potential edible and medicinal compounds.

SHARMA, Manoranjan H - Department of Botany, Thoubal College Thoubal (India), H Rajanikanta Sharma - Indian Institute of Science Education and Research (IISER), Mohali, Punjab (India), and A Radhapyari Devi - PG Department of Botany DM College of Science Imphal, Manipur (India)

The Diversity of Leafy Vegetables used by the Meitei Community in Imphal East District of Manipur (India)

Manipur is a hilly state in the remote north-eastern corner of India. The state of Manipur is included under the "Indo-Burma Hot spot". Manipur has a rich diversity of flora which includes a large number of economic and medicinal plants. The state of Manipur is inhabited by people of various ethnic groups and communities. The major inhabitants are the Meiteis an Indo-Mongoloid group speaking the Tibeto-Burman language. They constitute nearly 57% of the total population of the state. The Meitei community uses a wide variety of plant leaves as vegetable. The present study reveals that the Meitei community uses 120 plant species belonging to 88 genera which are distributed over 46 families. The use of wild vegetables by the community increases during famine and droughts which is an indication of the adaptability of the Meitei Community to the changing conditions of the environment *Acacia pruinescens* Kurz., *Allium consanguineum* Kunth, *A. hookeri* Thwaites, *A. tuberosum* Rottl. ex Spreng., *Alternanthera philoxeroides* (Mart.) Griseb., *A. sessilis* (L.) R.Br. ex DC, *Antidesma acidum* Retz., *Cardamine hirsuta* L., *Cissus adnata* Roxb., *Corchorus capsularis* L., *Elaeocarpus floribundus* Blume, *Eryngium foetidum* L., *Euphorbia hirta* L., *Ficus palmata* Forssk., *Meyna laxiflora* Robyns, *Neptunia prostrata* (Lamk.) Bailey, *Parkia timoriana* (A. DC) Merr., *Polygonum perfoliatum* L., *Solanum villosum* Mill. ssp. *villosum* Edmonds, *Trapa bispinosa* Roxb., *Vicia sativa* L., and *Zanthoxylum acanthopodium* DC are some of the more uncommon plants which are used as leafy vegetables by the Meitei community of Manipur.

SILVA, Taline Cristina- Federal Rural University of Pernambuco, MEDEIROS, Maria Franco Trindade- Federal University of Campina Grande, Peroni, Nivaldo- Federal University of Santa Catarina, and Albuquerque, Ulysses Paulino- Federal Rural University of Pernambuco.

Classification of cultural ecotopes in a Brazilian Cerrado Forest

Different cultures relate to their environment dissimilarly by classifying and naming distinct types of landscapes, both by utilitarian and cognitive factors. Data on local classification of cultural ecotopes can yield more nuanced understanding of environmental history. Such history can be accessed by individual as well as collective memories embedded in local society. Certain landscapes determined by human-mediated disturbance may hold particular significance locally. Residents in a 40,000 ha *cerrado* forest in Northeastern Brazil recognized 304 terms for cultural ecotopes therein. This vocabulary derives largely from names of earlier forest dwellers, cultural symbols, and terms for local biota, including useful ones. Data from this landscape classification as well as cultural ecotopes mapping, indicates places of intense human activity, both past and present; these also reference variation in land management strategies over time. Environmental and climate change can be assessed as well thereby at this local level.

SIMON, Eric - University of North Texas

Mind the Gap: overcoming the language barrier in water resource management

Recent literature suggests that the implementation gap in integrated water resource management is a result of differing *mental models*—cognitive frameworks that influence perception—among researchers, policymakers, and end users. The dominance of particular mental models in management discourse acts as a disincentive to

participate for those who do not share them. This paper attempts to sketch a neutral framework that can accommodate divergent mental models, and can be used effectively to communicate among them. I analyze the mental models argument in terms of post-positivist epistemology, and construe the lack of effective stakeholder participation as resulting from a *language barrier*. I examine several attempts by researchers to breach this barrier via social learning theory, and argue that these exercises retain elements of discursive dominance. I then propose a conceptual model—the *water phase*—as a tool to translate among the various languages that seek to describe water from differing perspectives.

SNIVELY-MARTINEZ, Amy - Washington State University

Household determinants of home garden presence in an indigenous Mexican community

The purpose of this paper is to determine what household factors are associated with the presence of home gardens in the indigenous Purhépecha community of San Francisco Pichátaro, Michoacán. Two models of logistic regression were utilized to determine what economic activities are most associated with home garden presence, and what household characteristics are associated with home garden presence. In addition, a partial correlation analysis was used to determine which household members are most correlated with home garden maintenance. I found that resin extraction and embroidery are the two economic activities most associated with home garden presence. The presence of a parental home garden is also associated with current home garden presence. In addition, households who had members that migrated were associated with home garden presence. Both men and women heads of household were correlated with home garden maintenance.

SULLIVAN, Alan - University of Cincinnati

Re-thinking the Effects of Human-Controlled Ignitions on Ancient Economies and Modern Forest Health

It has long been presumed that water-dependent corn (*Zea mays*) agriculture was the only subsistence economy capable of supporting significant population concentrations in the prehispanic American Southwest. My alternative to this orthodox view posits that anthropogenic fire was as a vegetation-community management technology that could be used to propagate wild plants in bulk quantities. Supported by new archaeological and geoarchaeological data, the emerging picture is that the systematic encouragement of wild plants in pyrogenic resource patches was a sustainable practice that enhanced food-supply security by insulating populations from short-term environmental variability (e.g., rainfall patterns) and long-term climate change. Importantly, these kinds of studies indicate that low-intensity burning did not involve widespread deforestation, as some models of Holocene climate change suggest, and that fire suppression has made modern forest ecosystems more vulnerable to the fire regimes they once tolerated -- the implications of which we are just beginning to appreciate scientifically and culturally.

SZPAK, Paul - University of Western Ontario

Significant Others: Understanding Animal Lives in the Archaeological Record

Zooarchaeological analyses of animal remains recovered from archaeological sites have been, and continue to be, largely focused on reconstructing the circumstances under which animals came to die and become incorporated into the archaeological record. In this paper, I argue that if our goal in zooarchaeological research is to better understand human-animal and human-environment interactions, we must shift our focus away from animal deaths and towards animal lives. This is especially true within the context of animal husbandry, where the restricted spatial and extended temporal conditions under which humans and animals interact facilitates a high degree of mutual familiarity. I detail some of the methodological techniques that would allow for an examination of lived, interspecies entanglements in the archaeological record, with a focus on stable isotope analysis of archaeofaunal material.

SZYMANSKI, Ryan M. - Washington State University, Anthropology

Microbotanical Evidence for Pastoral and Agricultural Landscape Modification in Nyanza, Kenya

Generally poor preservation of macrobotanical materials in East African archaeological contexts has forced archaeologists to rely heavily on other secondary material proxies in interpretations of early agriculture and plant use in this region. Use of microbotanical evidence, including pollen, phytoliths, and fungal remains, in the

investigation of changes in food production strategies is a methodology that is increasingly gaining momentum. Data on pollen and fungal spores extracted from a late-Holocene sediment core from Yala Swamp, Nyanza, Kenya, is presented to illustrate the potential of microbotanicals to yield temporally and ecologically nuanced information on local food production histories by contextualizing archaeological and paleobotanical remains more broadly within local frameworks of environmental change and human landscape modification. Changes in the representation of pollen and fungal taxons at this locality suggest that both human activity and long term environmental fluctuations have conditioned the ecology of Yala Swamp through time.

TALBERTH, John - Center for Sustainable Economy, and Susan Leopold - United Plant Savers
Reviving Dormant Ethnobotany: The role of women and plant knowledge in a food secure world

For the vast majority of human evolution traditional ethnobotanical knowledge (TEK) has been an essential form of human capital relied upon for nutritionally balanced, diverse, and stable supplies of food from wild plant sources. While TEK is still prevalent where indigenous cultures and native ecosystems co-exist, in many other regions it is thought to have vanished. We demonstrate that this is not necessarily true. In many regions TEK instead lies dormant in the memories of elders – mostly women – who retain knowledge specific to the ecosystems in which they were raised. Preserving TEK is widely recognized as a key solution to the global food security challenge. We argue that it may be necessary not only to protect the TEK where it is used in a dynamic or active sense, but to revive this knowledge where it is not extinct, but merely dormant in both developed and developing world settings.

TESHOME, Awegechew - USC Canada, Sarah Paule DALLE - USC Canada, Zemedet Asefaw - Addis Ababa University, Samson Gashu - Ethio-Organic Seed Action (EOSA), Bayush Tsegaye - EOSA, and Regassa Feyissa - EOSA

Sorghum landrace diversity and farmers' selection criteria: twenty years of farmer-led innovation for livelihood security and climate change resilience, Ethiopia

Long-term changes of sorghum landrace diversity in five agricultural landscapes of the Central Highlands of Ethiopia were studied in 1992/93, 2000/01 and 2012/13. The influence of farmers' selection criteria, land size, seed sources, community seedbanks, altitudinal gradients and soil factors on the dynamics and maintenance of crop diversity on-farm were investigated. In each of the three research periods, over 300 farmers were interviewed and their fields were surveyed. Over the 20-year period, significant increases were found in the number of seed sources and in the diversity of sorghum landraces and of the associated selection criteria. The implications of landrace diversity to resilient seed, food and livelihood security and to farmers' adaptive capacity to climate variations and extremes are discussed. Strategies for strengthening diversity-based agriculture and climate change adaptation through farmer-scientist collaboration are outlined.

ULICSNI, Viktor - Department of Ecology, Faculty of Science and Informatics of the University of Szeged, Hungary

Folk knowledge of invertebrate species in Central Europe

In Central Europe there has been many ethnobiological research on the folk knowledge of plants, but much less on animals. Among them non-domesticated species and especially invertebrates are very underrepresented. In a global view research has mainly focused on tropic and boreal human communities. We carried out our research among Hungarians in three landscapes: Szilágyság in Romania, Drávaszög in Croatia and Gömör in Slovakia. Our main goal was to document the local ecological knowledge on all known invertebrate species. 57 knowledgeable persons were interviewed using colour photographs of about 200 invertebrate species which were classified by the informants to ca. 125/147/163 folk taxa. We found that the majority of the interviewed people still possessed surprisingly detailed and precise knowledge on the invertebrates living in their surroundings.

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Livelihood and Revenue: role of rattans among Mongoloid tribes and settlers of Andaman and Nicobar Islands, India

The Andaman and Nicobar Islands, located in the Andaman Sea between peninsular India and Indo-Malaya are part of two of the 34 mega diversity hotspots of the world. These islands are characterized by their unique vegetation types such as littoral, mangroves, wet and semi-evergreen and rain forests and also for being the home for six aboriginal tribes of *Negrito* and *Mongoloid* descent. The islands are also home to a number of migrants and 'settlers' from the Indian mainland and Myanmar (Burma). In this paper, we address the ethnic utilization of rattans, the unique climbing palms, 12 of the total 19 species are endemic to these islands. In this study, besides the ethnic uses, we answered for the reasons of high variations in the revenue flow among traders such as collectors, processors and exporters due to the distant oceanic trade and an ingenuity of the intermediaries involved in the trade.

UMESH, Narta - Department of Botany, Govt. Post Graduate College, Seema (Rohru), Himachal Pradesh, India, and Sarvesh K Sood - Department of Biosciences, H. P. University, Shimla-5, India

Sacred Groves of Himachal Himalayas and their role in natural resource management in a changing environment

In Himachal Himalaya which is commonly referred to as *dev-bhumi* (land of Gods) in India, the overlap of geography, religion and culture has created a situation that has favoured their integration with sustainable natural resource use and management. Such integration is reflected in the institution of sacred groves (forests of the God) preserved on religious grounds and based on certain taboos and strong beliefs supplemented by mystic folklores are indicators of the conservation ethics of local community. Modernisation is gradually changing the life and culture of the aboriginals, but the institutions of sacred groves have withstood these waves of change. They have been promoting *in-situ* conservation of biodiversity and simultaneously have rendered a plethora of ecological and socio-economical services to people of the region. The present paper attempts to present the effectiveness of sacred groves in natural resource management in Himachal Pradesh in India in a changing environment.

VARGA, Anna - University of Pécs, Hungary, and Zsolt Molnár - MTA Centre for Ecological Research
Semi-traditional ecological knowledge in Europe: the case of wood-pasture management in Hungary

The management of open-woodland habitats has a long history in Hungary. However, beginning with the Enlightenment this silvopastoral management has been vanishing. Today most of the remnant wood-pastures lie in nature protected areas and they are managed by the national park's on-ground managers. Our question was: what kind of knowledge traditional herders and the new managers have on wood-pastures and their management. We made semi-structured interviews and did participatory observations in oak-beech wood-pastures. The main differences we found between herders' and managers' knowledge were the aim of management and the definition of wood-pastures. These differences were, however, much smaller if managers were open for traditional management and had their own experiences in animal husbandry. In these cases their knowledge was a transitional knowledge we called semi-traditional. Our results showed, that traditional and academic ecological knowledge have a functional interaction in Central-Europe.

WALKER, Ashlie - Southwestern Oklahoma State University, and Castle, Lisa - Southwestern Oklahoma State University

Preliminary Search for Biologically Active Secondary Metabolites from *Cyclanthera dissecta*

Antimicrobial assays were performed on *Cyclanthera dissecta* (Cucurbitaceae) to determine if the weedy annual vine warrants further investigation as a medicine. Students at Southwestern Oklahoma State University have begun long term monitoring of a local *Cyclanthera dissecta* population in order to learn how it responds to changing weather and land use patterns. The native species is very poorly studied, but has life history traits that suggest it could be a problematic weed, as well as edible and medicinal relatives including *Cyclanthera pedata*,

Cyclanthera explodens and *Cucumis metuliferus* that suggest it might have healthful properties for humans. In this study we examine the results of the initial antimicrobial assays performed on de-fatted organic extract of dried *Cyclanthera* vines. These analyses are the initial stages of identifying bioactive compounds.

WELCH, James R. - Fundação Oswaldo Cruz, Coimbra JR., Carlos E. A. - Fundação Oswaldo Cruz, and Brondizio, Eduardo S. - Indiana University

Vegetation change during four decades of management with fire by the Xavante Indians in Central Brazil

The Brazilian cerrado, a complex fire-adapted tropical savanna-like biome with enormous biodiversity, is threatened by accelerated conversion to industrial agriculture. Historical documents since the early nineteenth century reveal that collective hunting with fire by the Xavante Indians has long been an important aspect of this group's landscape management practices. In this paper, we provide an ethnographic account of the Xavante practice of hunting with fire and present evidence from spatial analysis of satellite imagery from 1973 to 2010 comparing vegetational change under management by the Xavante and neighboring agribusiness. We show that Xavante landscape management practices, including hunting with fire, resulted in the greening of areas previously deforested by non-indigenous occupants. Our findings call into question the widespread assumption that the non-alteration of tropical landscapes through the suppression of indigenous anthropogenic fire is a beneficial strategy for reducing deforestation in the cerrado.

WILLIS, Staci - Texas A&M University

Applying Botanical Analyses to the Study of Ancient Shipwrecks, an Example from the Palynological Investigation of the Stella I Roman Era Laced Boat

Standard botanical analyses – such as wood and fiber identification – have long been an essential part of nautical archaeology, the study of ancient ships. The incorporation of more recent techniques, including phytoliths and pollen, has the potential to transform the analysis of shipwreck remains from a simple identification of materials used in construction to a more nuanced understanding of the processes of ancient ship construction. The Stella 1 laced boat is one of about a dozen laced wooden-plank boats excavated in the northern Adriatic that date to the Roman imperial period and provides a working example of these possibilities in botanical analyses. Analysis of the pollen microfossils within the caulking and cordage samples of this vessel yields clues to the nature of the sites where these materials were processed in antiquity, and allows for conclusions to be drawn about the broader socio-economic framework driving the construction of this local boatbuilding tradition.

WINSTEAD, Christy- University of North Texas, and Amy Hoffman - University of North Texas

Drought, Animal Resources and Ceremony: Comparative Analyses of Faunal Remains from Ancestral Puebloan Great Kivas

Did drought conditions affect how the Ancestral Puebloan people used animal resources in ceremonial areas? The “Great Drought” in the American Southwest occurred from AD 1276-1299, which is thought to be the impetus for abandonment of the region. We investigate faunal remains from two great kivas in Goodman Point Pueblo Unit in southwestern Colorado; one kiva (5MT16805) decommissioned before the drought (1260's) and the other kiva (5MT604) decommissioned toward the end of the drought (1290's). Comparative analyses of species richness, prey choice and taphonomy provide insight on how people used animals in great kivas before and during the “Great Drought”.

WOLVERTON, Steve - University of North Texas, Department of Geography, Waquar Ahmed - University of North Texas, Department of Geography, and Justin NOLAN - University of Arkansas, Department of Anthropology

The Ethnobiological Perspective

Ethnobiology is increasingly recognized from within and outside of its boundaries as interdisciplinary. University courses are taught in ethnobiology, and the Society of Ethnobiology defines the field as “the scientific study of dynamic relationships among peoples, biota, and environments.” However, it is important to ask what it is that unifies ethnobiology: is it simply common subject matter? Or, is there an underlying emphasis that represents an “ethnobiological perspective?” Answers to these questions are critical

for further establishment and future enrichment of the field as an interdisciplinary human-environmental science, particularly inference to climate change, conservation, and ethnobiology. An ethnobiological perspective should be inherent in how ethnobiologists respond to the question: “what is an ethnobiological perspective?” This presentation reports a content analysis of essay responses to that question by ethnobiologists.

WYLLIE DE ECHEVERRIA, Victoria - University of Victoria, Victoria B.C.

Moolks (Pacific crabapple, *Malus fusca*) on the North Coast of British Columbia: Knowledge and meaning in Gitga’at culture

I examined ethnobotanical uses, traditional knowledge and folk classification of **moolks**, Pacific crabapple (*Malus fusca* (Raf.) C.K. Schneid.; Rosaceae) for the Gitga’at First Nation of Hartley Bay. I conducted interviews with seven Gitga’at elders, who recognize up to five distinct varieties **moolks**, based on fruit characteristics and harvesting location, each with its specific applications. To determine ecological and morphological variability of **moolks** within its traditional harvesting area, I sampled and measured foliage and fruits from individual trees and different sites. While some fruit and leaf traits are correlated, I identified significant variation between and within trees making it hard to delineate the varieties as described by the elders. I conclude using these two knowledge systems – traditional ecological knowledge and scientific knowledge – in conjunction, can result in a more detailed understanding of a botanical species.

ZAGAROLA, Jean-Paul - Siuslaw Watershed Council, and Christopher Anderson - Institute of Polar Sciences, Natural Resources & Environment, National University of Tierra del Fuego

A socio-ecological assessment of watershed ecosystem services in southern Patagonia

Research on human dimensions of ecosystems through the ecosystem services (ES) concept has proliferated over recent decades but has largely focused on monetary value of ecosystems while excluding community based values. We conducted three hundred twelve surveys of general community members and regional researchers and decision-makers (specialists) to understand local perceptions and values of watershed based ES and natural resource management in the southern Patagonian ecoregion of South America. Results showed that specialists share many similar values of ES as community members but at the same time they do not capture the diversity of values that exist within the broader community. Both groups perceive a lack of communication and access to basic scientific information in current management approaches. We recommend that a community based approach be integrated into the natural resource management framework that better embodies the diversity of values that exist in these communities, while enhancing the science-society dialogue.

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