Paleoenvironmental Field Methods & Sustainable Forest Management

Wednesday 26 June – Tuesday 02 July 2013
Salish Kootenai College, Pablo, MT

By:

U.S. Geological Survey | Northern Rocky Mountain Science Center (NOROCK)
TEchnical training in Support of Native American Relations (TESNAR)

In partnership with:

Salish-Kootenai Tribal College | Department of Natural Resources
Montana State University | Earth Sciences Department
U.S. Forest Service | Rocky Mountain Research Station
University of Montana | Department of Ecosystem and Conservation Sciences

Course Contacts:

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COURSE SCHEDULE

WEDNESDAY, JUNE 26 – INTRODUCTION, COURSE OVERVIEW, CLIMATE CHANGE 101, FUNDAMENTALS OF PALEOENVIRONMENTAL SAMPLING METHODS

- **8:30-9:15** *Instructor and student introductions & class overview*
- **9:15-10:00** *Climate & environmental change: causes and consequences in the Western U.S. (Greg Pederson)*
- **10:00-10:15** *Break*
- **10:15-10:45** *Overview of types of environmental proxy records, general sampling protocols, and more brief examples of uses (Greg Pederson)*
- **10:45-11:45** *The climate drivers of past (1650-1900) and present (1900-2003) regional-fire years in the Northern Rockies (Emily Heyerdahl)*
- **11:45-1:00** *Lunch Break*
- **1:00-2:00** *Changes in climate, forests, and fire regimes of the Northern Rockies over the Holocene (Dave McWethy)*
- **2:00-2:15** *Break*
- **2:15-3:15** *Traditional forest and fire use, sustainable forestry and fire management goals on CSKT lands (Rick Everett)*
- **3:15-4:15** *Use of historical data and reference sites in Forestry Management and Restoration (Cara Nelson)*
- **3:15-4:15** *Review schedule and logistics for Thursday and rest of week (Greg Pederson)*

Provide students with Fundamentals of Tree-Ring Research chapters 2 & 5, and Northern Rockies tree-ring based papers on climate and fire to read for the evening & discuss in the field.

THURSDAY, JUNE 27 – FIELD DAY: DENDROCHRONOLOGY SAMPLING METHODS

- **8:00-9:00** *General intro to fire history and sampling methods from tree rings (Emily Heyerdahl & Rick Everett – 45 min) with brief overview of tree-ring based climate and avalanche history (Greg Pederson 15 min)*
- **9:00-10:00** *Drive to dendrochronology field site for fire history focused project*
- **10:00-10:15** *Break*
- **10:15-11:00** *Instructor led demonstration of increment borer and chainsaw based sampling with proper safety procedures, note taking, mapping, and sample handling*
- **11:00-12:00** *Instructors and tribal staff work with individual students practicing safe sampling techniques*
- **12:00-1:00** *Lunch*
- **1:00-4:00** *Students and Instructors work together to collect preliminary fire history in SKC forest*
- **4:00-5:00** *Return to SKC via vans & discuss Fridays class objectives*

Provide students with Knowing Yellowstone and Whitlock and Larson chapters covering fundamentals of lake-sediment based research, and 1 additional lake-sediment based research paper to read in the evening & discuss in the field.

FRIDAY, JUNE 28 – FIELD DAY: LAKE SEDIMENT SAMPLING METHODS

- **8:00-9:00** *Drive to SKC Lake for lake sediment sampling demo*
- **9:00-10:00** *General intro to sampling methods for fire and vegetation history from lake sediments (Dave McWethy)*
- **10:00-10:15** *Break*
- **10:15-11:30** *Assemble coring platform & demonstrate proper usage and function of Livingston corer (Dave McWethy)*
- **11:30-12:30** *Early Lunch*
- **12:30-2:30** *Collect lake sediment core(s)*
- **2:30-4:00** *Demonstrate sample extrusion, field prep/sampling of core, and proper sample storage for transport. Students practice and contribute.*
- **4:00-5:00** *Return to SKC*

Provide students with overview readings on laboratory methods for processing tree-ring and lake sediment data (workbook chapters). Instructors prep lab and samples for Saturday processing.

SATURDAY, JUNE 29 – LABORATORY DAY: PROCESS TREE-RING & LAKE SEDIMENT DATA GENERATING PRELIMINARY FIRE DATES FROM BOTH PROXIES

- **8:00-9:00** *Instructors demonstrate mounting, sanding, & dotting of tree-ring cores and cross-sections with segment on fire scar identification, measuring, and overview of cross-dating methods (Greg Pederson & Rick Everett)*
- **9:00-10:00** *Instructors demonstrate sectioning & sampling of lake sediment cores, along with overview of charcoal and pollen counts under the microscope (Dave McWethy)*
- **10:00-10:15** *Break*
- **10:15-12:00** *Students break into 2 groups and practice tree-ring and lake sediment methods at each station with instructor oversight*
- **12:00-1:00** *Lunch*
- **12:00-5:00** *Students process samples and compile raw data for analysis*

Provide students with forestry and fuel management papers for discussion and integration of concepts into Saturday research presentations.

SUNDAY, JUNE 30 – DATA PROCESSING (CONTINUED)

- **9:00-5:00** *Students continue to process samples and compile raw data for analysis*

MONDAY, JULY 1 – DATA ANALYSIS AND PRESENTATION PREP.

- **9:00-12:00** *Students process raw data into fire history chronologies. Preliminary tree-ring crossdating will be conducted and organic matter for radiocarbon dating will be collected from lake sediments.*
- **12:00-1:00** *Lunch*
- **1:00-5:00** *Designing research to address CSKT forestry and fire management needs. Student's work in small groups to put together 15-minute presentations summarizing the data they collected, and future research projects they would like to pursue.*

TUESDAY, JULY 2 - SUSTAINABLE FORESTRY MANAGEMENT, USING THE PAST TO INFORM MANAGEMENT, AND STUDENT PRESENTATIONS

- **8:00-9:00** *Tribal forest management goals synthesis talk (Rick Everett)*
- **9:00-10:00** *Forest ecosystem restoration: Re-thinking strategies to support ecosystem resilience (Cara Nelson)*
- **10:00-10:15** *Break*
- **10:00-12:00** *Students give presentations*
- **12:00-1:00** *Collect student contact information and conduct any necessary assessments/surveys. Course Wrap-Up.*