

YBRA UPLIFT



Issue 23

Annual Newsletter of the Yellowstone-Bighorn Research Association (www.ybra.org)

2017



Scenes from YBRA. 1st row: Matt Goring & Montclair Univ. students in the lodge; Penn. State Univ. students in the Library study hall; 2nd row: sunset over YBRA; “Ancient Wyoming” book signing by Kirk Johnson & Clyde Will (r), joined by YBRA’s Evan Lavery & Greg Creasy (l), at Buffalo Bill Center of the West; 3rd row: Dutcher dorm foundation & Greg Creasy; first logs assembled by Rudy Slingerland, Larry Garnezy, & Roland Sauermann; walls in place; 4th row: lodge addition deck; first logs with Tara Gates (l) & Peggy Timm (r) for scale; walls up

Building for the Future

From the President,

These are exciting and busy times for YBRA. We continue to serve record numbers of clients, our outreach is benefitting our organization in many ways, and operating revenues and donations reached record levels in 2016. Strategies are being discussed that should ensure YBRA is vital and relevant for many years to come.

Fund-raising efforts for the “Dutcher Dorm” and bathroom-utility addition to the lodge were successful! We are now in the construction phase and anticipate finishing both projects by the end of the season. This achievement was made possible solely through donations by YBRA members and supporters: 32 individuals or couples and two foundations contributed to the dormitory project in 2016-17 bringing the total raised to \$53,000. I am particularly grateful to Jim Lightner, Jack Crelling, and Linda Dutcher for directing the final fund-raising efforts for the dormitory. Donations from 21 individuals or couples and one foundation in 2016-2017 toward the lodge addition brought the total raised to almost \$13,000. As of this writing, both buildings have foundations, sub-floors, exterior walls, and roofs. The new dormitory will allow us to reconvert Dusenbury to a study hall, a much needed facility when 3 or more groups occupy camp, while maintaining around 106 beds for clients. The lodge bathroom-utility will be used primarily by staff and is a long overdue upgrade.

In 2016 we reached record numbers of people hosted at camp and operating revenues generated (see Financial Summary). About 375 people utilized YBRA, an increase of ~4 % over last year, 240 of which were students in 7 university courses. Other user groups included the New Jersey State Museum, Woods Project, US Forest Service, and Search and Rescue Dogs of the US. Numbers for 2017 are projected to be slightly lower due to a course cancelation and the termination of camp use by one group. This record activity puts considerable strain on our camp staff, which we are working to ease through tighter scheduling of groups, staff, and meals.

Our outreach efforts in 2016-2017 again made big strides both at the local and national levels. We continue to host an Open House for the Red Lodge community that attracts 30 - 75 attendees, and participate in the Red Lodge Fun Run for Charities sponsored by the Red Lodge Area Community Foundation. Our 2016 YBRA Alumni-Industry Symposium was well received by ~45 alumni, supporters, and community members. The 2017 symposium will feature YBRA member Kirk Johnson, the Sant Director of the Smithsonian National Museum of Natural History, as a keynote speaker, and other distinguished alumni (see Agenda, p.7). Early this year, we donated our library holdings to the McCracken Research Library at the Center of the West (Buffalo Bill Museum) in Cody, WY where they will be available for reference within a one hour drive of camp. At the national level,

YBRA again advertised at the 2016 national GSA meeting in Denver, and 2017 national AAPG meeting in Houston. All of these efforts are increasingly benefitting YBRA by spreading our story, connecting with new supporters, and reconnecting with alumni.

Last year we held a strategy meeting where YBRA members, symposium speakers, and others discussed and evaluated our operations and future plans. I felt it was extremely valuable and we will be holding another meeting on August 14, 2017, the day before our symposium. Recent discussions have focused on how to diversify, complement, and expand what we offer to the Earth Science community. Teacher/student training in STE(A)M and instruction in advanced technologies (GIS, Remote Sensing, LIDAR, etc.) are two areas of current focus. Potentially these discussions could lead to new revenue streams for YBRA and a more stable future.

Fund-raising is now underway for two high-priority projects, a “Bonini cabin” named in honor of Bill Bonini who passed away last year, and replacing shake roofs with metal on the Heroy and Thom dormitories. Bill’s wishes were that donations in his memory be directed to YBRA. The response has been very encouraging and the Bonini family would like to direct the funds toward a cabin with bathroom. Information for contributing to YBRA is on page 6 of this newsletter, included with the proxy, and on our website, www.ybra.org.

All of our activities are increasingly communicated by e-mail and through our Facebook, LinkedIn, and website blog outlets. Follow us through these media, enjoy YBRA news stories, and offer us feedback. Be sure to provide us your e-mail address to update our records, if you haven’t already done so, and make sure to send in your proxy and dues, and, if possible, donations, before **August 31, 2017** (see p. 6 and proxy form).

Over the past 81 years, YBRA has had exceptional success in fulfilling its educational, research, and outreach mission. We understand that YBRA members are at the core of this success and with our continued efforts we can ensure YBRA thrives for another 81 years!

Richard Fifarek...

rhfifarek@gmail.com



Bill Bonini (r) teaching plane table mapping, 1950s(?) .

2017 Camp Schedule

This year we welcome new geology courses from West Chester University and Westminster College. Jason Schein, formerly with the New Jersey State Museum, will continue paleontological work with the same crew under a recently formed non-profit group, the Bighorn Basin Paleontological Institute (BBPI). We are particularly excited that Kirk Johnson, a YBRA alumnus who is the Sant Director of the Smithsonian National Museum of Natural History, and several board members of the Smithsonian will visit camp during the week of our Alumni-Industry Symposium. New groups added to our schedule over the last 5 to 10 years have been vital in making up for the revenue lost when other groups have terminated their use of camp. Already we have new groups inquiring about using our facilities in 2018.

MAY — JUNE

May 28-June 5: Montclair State Univ.
 June 5-23: Univ. of Houston/YBRA Geology Course I
 June 11-17: Pennsylvania State Univ. Geology Course
 June 18-30: Southern Illinois Univ. Geology Course
June 25: YBRA annual summer meeting

JULY

July 1-9: Southern Illinois Univ. Geology Course
 July 2-31: Bighorn Basin Paleontological Group
 July 8: Univ. of Houston/YBRA Geology Course I
 July 9-27: Univ. of Houston/YBRA Geology Course II
 July 10-31: Ohio Univ. Geology Course

AUGUST — SEPTEMBER

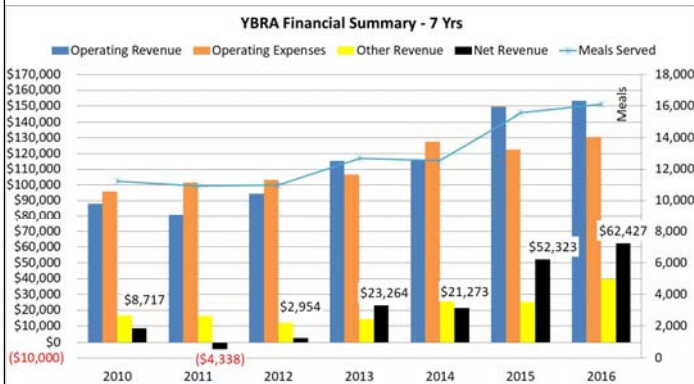
August 1-12: Bighorn Basin Paleontological Group
 August 1-4: Ohio Univ. Geology Course
 August 11: Univ. of Houston/YBRA Geology Course II
 August 9-12: West Chester Univ. Geology Course
August 15: YBRA Alumni-Industry Symposium 2017
August 19: YBRA Open House
 August 15: Smithsonian Museum of Natural History
 Aug. 31-Sept. 3: Westminster College Geology Course

YBRA Financial Summary - 7 years

The financial picture for YBRA has improved significantly over the past seven years, particularly beginning in 2013 (see bar graph below). Operating revenues now routinely exceed operating expenses, which has been a major goal of ours over this period. The increase in revenues from users is the result of increases in the number of groups, enrollments, and camp rates during this period. The student rate for room and board in 2016 was \$33/day, which is at the low end of the range of several other field stations. We intend to increase this rate over the next few years to a more average level. Operating revenues naturally track the number of clients using our facilities, which can be measured by the total meals provided in a season. In 2016, Jeanette and her staff served over 16,000 meals(!), a truly remarkable figure, representing an increase of 3.5 % over 2015. Operating expenses also have increased in the past seven years, but at a lower rate than revenues.

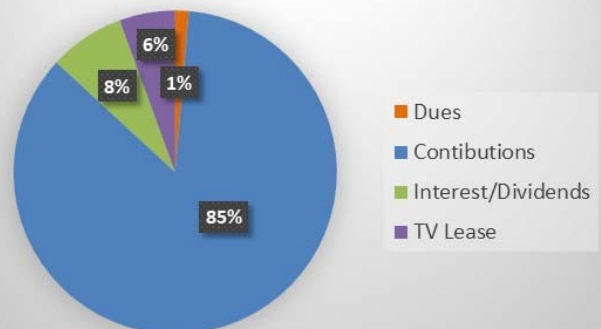
Furthermore, the pie chart below shows how vital revenues from other sources have been to our financial health. In the past, these funds covered deficits in the operating budget, which alternatively could have been used for maintenance and unexpected expenses. Most importantly, a breakdown of these “other” revenues highlights the dominant role (85 %) of designated and undesignated contributions from members and supporters. Current membership dues account for a minor portion of our budget.

Net revenue exceeded \$62,000 in 2016, which allowed us to begin two building projects and tackle camp maintenance issues, although the deferred maintenance backlog remains substantial. Overall, I am pleased to report that YBRA is in good financial shape and is debt free. Clearly, our continued success is due in large part to contributions from members and supporters. On behalf of YBRA and the students who receive their field science education at our facilities, Thank You!



YBRA financial summary of revenue and expenses from 2010 - 2016 along with total meals served.

Other Revenue (2016)



Sources of “other” revenue (not generated by user groups) as percentage for 2016.

YBRA People

William (Bill) Bonini, a long time YBRA member and officer, passed away in 2106. His obituary may be viewed at <http://matherhodge.com/tribute/details/979/William-Bonini/obituary.html>. Bill had a tremendous impact on YBRA and the lives of the many students he taught and mentored at Princeton University over several decades. Bill requested that memorial donations be directed to support YBRA (see details, p. 6).

Remembering Bill Bonini ... by Jen Bonini ...

In the summer of 1946, the late Professor Taylor Thom (Princeton University faculty 1927-1957) introduced Bill to field geology in the Cody-Elk basin, Wyoming area, an experience that set his professional life trajectory. Bill spent much of his career intimately involved with the Yellowstone Bighorn Research Association as a faculty member and in leadership positions. He was a longtime member of the YBRA governing Council, from 1955 continuing into retirement, and as an honored Special Councilor (emeritus status) to 2016. He served as President of the YBRA from 1958-1959 and again from 1971-1973. He was Director of the Princeton Summer Geology Field Course at the YBRA for over 30 years starting in 1959. He also directed Princeton University Alumni Colleges "Exploring the Beartooth Mountains" through the 80s and 90s, bringing the YBRA and Red Lodge to generations of Princeton alumni; these were early models of what morphed into Princeton Journeys. The YBRA meant a great deal to Bill and his family. The field course was a focal point for Bill's enthusiasm for field work, education, geology and his students; the health and stability of the camp as a base for research and teaching was dear to his heart.



Bill and Rose Bonini at "the point", 1992.

Walter "Walt" Simonson

For decades students have paused to look at a poster of hand-drawn wild flowers near the sink in the dining area of Fanshawe Lodge. The artwork was creat-

ed by Walt Simonson, a student in the 1966 YBRA geology course. Walt went on to become a well known comic book writer and artist who worked on Marvel Comic's *Thor* series and numerous other popular series and characters (https://en.wikipedia.org/wiki/Walt_Simonson). His distinctive signature, patterned after a Brontosaurus, is found on the poster (see photo, p. 7).

Featured Article

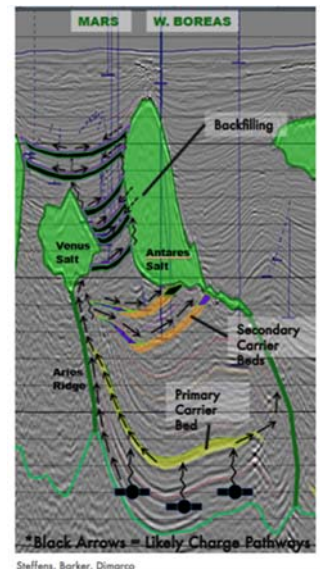
Each year we publish an original article or summarize a publication/presentation by a YBRA member. The article and figures below are based on a talk presented at the 2016 YBRA symposium. The authors, Larry Garmezy and Roland Sauermann, received their graduate degrees from Pennsylvania State University, have extensive experience in the resource industry, and are active alumni supporters of YBRA.

Play-Based Exploration: Applying Depth and Breadth of Geoscience Understanding Or.... Why Field Camp Remains Necessary in the Modern World

Larry Garmezy, YBRA 1974, Global Exploration Advisor, Shell International E&P – Retired, and
Roland Sauermann, YBRA 1981, President and CEO of SGV International

The components of a conventional Petroleum System are, at first blush, pretty simple. All you need for a hydrocarbon (HC) accumulation is:

- 1) **A Source Rock**
With sufficient organic content...
Heated to generate and expel HCs...
From a sufficient area, which can migrate into...
- 2) **A Reservoir**
Capable of storing and flowing HCs, which is located in...
- 3) **A Trapping Configuration**
That formed in time to "catch" the HCs, which has...
- 4) **A Sealing Lithology**
To contain the oil or gas (HCs)...



The hard part is keeping all these elements in mind at the same time, and making sure that **absolutely everything** is being considered. The good news is that everything you need you've basically learned by the end of your undergraduate education. And most importantly, the critical thinking skills crucial to success were learned while on the outcrop at field camp.

Forgetting Who We Were

Unfortunately, most of industry forgot these basics over a twenty-year period from the early 1980s through the early years of this century. The 1970s were characterized by a philosophy of “Leave no basin behind, explore everywhere.” **Geology ruled.** In the 80s industry got brave and stepped out into the deep-water ocean realm, and quickly the world changed. Onshore and shallow offshore discoveries dwindled, and everyone looked to the deep-water. At the same time a geophysical “silver bullet” came into the picture. Direct Hydrocarbon Indicators (DHIs) also called “Amplitudes” proved very successful at predicting the presence of hydrocarbons and predictably geology became seemingly less important. The DHI hunt was on, and an industry-wide “lobotomy” of geologic understanding occurred.

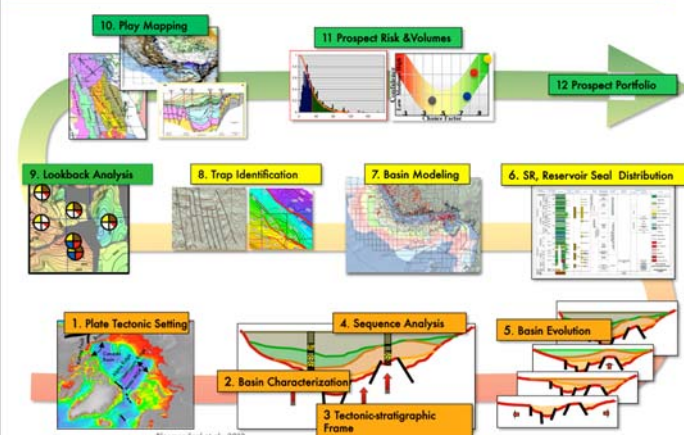
By the 1990s most geologists had also become DHI hunters, ignoring a complete understanding of a basin in pursuit of the amplitude signature of an oil or gas accumulation. Well logs, which had been the bread and butter of geologists for decades, became the domain of a specialized specialist, the petrophysicist. Interestingly, this also was the time when management review via PowerPoint began (the death of deep interrogation of the data).

Early in the new millennium, the industry was rocked by a decline in exploration success. It turns out that the DHIs were running out. Several other “silver bullet” technologies were tried but without the earlier success.

The Rebirth of Geology in Exploration

Slowly a realization began to sink in, that the new tools were not enough on their own. The tools needed to be combined with a back-to-basics approach, where geologic understanding of the complete system was the lever to greater exploration success. Each company called this “new” approach by a different name. At Shell we used the term “Play-Based Exploration” (a Play referring to a suite of prospects that share the similar four components described at the beginning of this article).

UNDERSTAND THE BASIN: BUILDING PLAYS FROM THE BOTTOM UP



This approach forces a variety of geoscientists to work together in a holistic fashion in order to create a deep and solid understanding of how a basin works, at all scales.

More importantly it relies on a solid foundation of geology, and critical thinking skills, the real tools of the trade.

Ability to solve geologic questions with often limited data

- Integrating data from a variety of sources
- Figuring out what is important quickly
- Coming up with creative solutions to answer questions
 - ◊ Often indirectly
 - ◊ Using appropriate technology

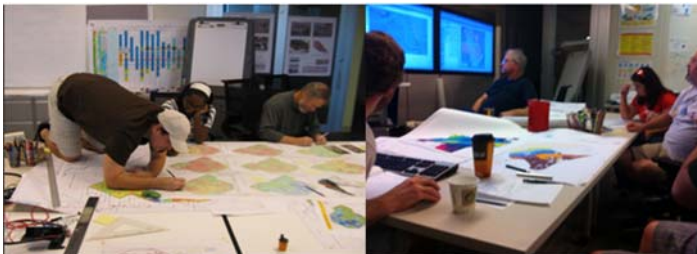
Create the complete geologic context of an opportunity while

- Honoring the data at a variety of scales
- Working to avoid biases
- Giving life to the alternatives (multiple working hypotheses)
- Realizing your own fallibility

And indeed Geology Field Camp is where these skills are developed and reinforced not just on a daily basis, but virtually every moment the student is on the outcrop. Critical thinking decisions cascade one after another all day long in this environment. Whether for oil and gas exploration, mining, environmental, hydrogeology, this is the kind of experience industry wants to know that a student has had.

This can be proved by asking graduates of field camp programs, not about their successes, but about what they missed or got wrong. The mistakes stand out as real learning, a lapse in critical thinking, even decades later. For me (Larry Garmezzy), I remember how hot a structure guy I thought I was, while mapping Area 4 of the Bear-tooth Front, only to have the rug pulled out, as Dr. Kauffman during our post-mapping review, asked me what those large boulders strewn across the slope were. I had totally missed the obvious glaciation event superimposed on the older structures I was so proud of. It's my misses that I remember, the places where I had forgotten the lesson of understanding the complete geologic context.

At field camp we learn to be forensic Earth detectives, thinking and working in 3D and by bringing in time, 4D. We rarely have the “smoking gun”, so we have to build a case based on circumstantial evidence. We have to be master integrators of diverse data, well data and petrophysics, geophysics (seismic, gravity, magnetics), geochemistry, basin modeling, paleontology, outcrop and analog data. As you can imagine, to do this a variety of specialists and geoscientists have to work well together in an environment of computers and old school maps.



(figures continued from previous page)

Book Review

by Jinny Sisson

Stories in Stone by David Williams

Almost every year, I recommend a geology themed book for your reading pleasure. This time I'm going to recommend a non-fiction book that I picked up while at AAPG helping advertise YBRA, as well as re-connecting with any YBRA alums. This year, you might enjoy *Stories in Stone: Travels through Urban Geology* available in hardcover from Amazon for \$10.50 written by David B. Williams, a resident of Seattle. Do not confuse this with *Stories in Stone: A Field Guide to Cemetery Symbolism*. The introduction focuses on why look at building stones. This struck a chord with me as I help lead tours of campus building stones for Physical Geology students at University of Houston. When you can't go see rocks in their natural setting, you can explore for them in buildings. So, this summer, if you get a chance, go look at some of the buildings near where you live and investigate where they were quarried and the history of the building stone. This book will give you a good start on many building stones used across the country. For example, brownstone, a name associated with late 1880's urbanization (and now with rundown apartments), was quarried in Connecticut from Triassic sandstones and used in buildings along most of the east coast. The two common rock names that all non-geologists know are granite or marble. These are both described from a variety of settings in Massachusetts, California and Italy. For each rock type, there are details about its geologic setting and processes that form it, history of various buildings made from this stone, history of the quarries and both architectural and artistic uses. If you were at YBRA when Erling Dorf was teaching or perhaps just went up the hike to Specimen Ridge in Yellowstone National Park, you probably saw the petrified wood including some large in situ fossilized sequoias among the Absaroka mudstones and lahars (see <https://archive.org/details/petrifiedforests00nati> for a copy of Dorf's field guide to the Lamar Valley). For you, there is a fascinating chapter about petrified wood used in a gas station in Lamar, Colorado. The final chapter in the book is about the youngest rock used as a building stone – travertine. This chapter is appropriate for any of you revisiting YBRA as well as Yellowstone National Park where you can practically watch travertine form at Mammoth Hot Springs. If you can schedule yourself for several visits over a month or two, you can see the growth of the ter-

aces as well as interaction of microbes and hot water. If you don't have the time to revisit, you can visit the National Park webcams that provide views of the current conditions of Mammoth and other locations around the park at <https://www.nps.gov/yell/learn/photosmultimedia/webcams.htm>

If you are going to the GSA annual meeting in Seattle this fall, come visit the YBRA booth in the exhibitor's hall and reconnect with your fellow YBRA alums. You may also want to get a copy of David Williams latest book entitled *Seattle walks: Discovering History and Nature in the City*. I've not yet read this book, but walk 3 is titled "Stories in Stone" which sounds like it may be similar to this book and is about buildings in the downtown area. So, if you have free time for a walk in Seattle, you can use this book to learn more about geology, history and architecture.

Contributing to YBRA

Contributions to YBRA are vital for sustaining our camp and its operations, and fulfilling our mission supporting field science education and research. With your help we can continue to provide the exceptional study environment that thousands of students have experienced over the last 81 years. Donations in any amount can be made to YBRA and, if desired, directed toward several funds including these two high-priority projects:

- 1) "**Bonini Cabin**", a new faculty cabin honoring Bill Bonini; goal is \$50,000, and
- 2) "**Metal Roofs**", replacing shake roofs on Heroy and Thom to minimize fire hazard; goal is \$6,000.

Donations to YBRA can be made by:

- 1) Check, made out to **YBRA - (designate project or fund), and sent to Y.B.R.A., P. O. Box 20598, Billings, MT 59104-0598.**
- 2) Credit card, using the "**Donate**" button at the YBRA website, www.ybra.org.
- 3) Donating stocks; contact **Denny McGinnis** (dbmcginnis@outlook.com) for information.

Do you shop on Amazon.com? If so, you can donate 0.5 % of the purchase price for most items to YBRA at no extra cost to you. Simply go to smile.amazon.com (note this is not simply amazon.com) from the web browser on your computer or mobile device, sign on with your amazon sign on, and choose YBRA as your designated charity.

Thank you for your continued support!

YBRA Alumni-Industry Symposium 2017 Agenda Tuesday, August 15

1:00 – 1:20 pm	Richard Fifarek, YBRA President <i>Introductions & YBRA's Legacy</i>
1:20 – 2:00pm	Kirk Johnson, Keynote Speaker, Sant Director, Smithsonian National Museum of Natural History <i>Resurrecting the Lost Worlds of the Bighorn Basin</i>
2:00 – 2:10 pm	Tyler Krutzfeldt, Founder and Managing Director, Mont Vista Capital <i>Tippet Rise-YBRA Partnership</i>
2:10 – 2:45 pm	Chris French, Director, Remediation Services, Honeywell International Inc. <i>Advances in Remote Sensing, Hyperspectral Imaging, LIDAR and Unmanned Aerial Systems</i>
2:45 – 3:15 pm	<i>Coffee Break</i>
3:15 – 3:45 pm	Colin Shaw, Assistant Research Professor and Geology Field Camp Director, Montana State University – Bozeman <i>Integrating Geomatics into the Field Curriculum: Case Study from the Montana State University Field Camp</i>
3:45 – 4:15 pm	Jim Lightner, Founder/Partner, Beacon E & P, Denver, CO <i>Fossil Fuels are Good for People and the Planet</i>
4:15 – 4:45 pm	Cathy Whitlock, Co-Director, Montana Institute on Ecosystems, Montana State University <i>Montana's changing climate: Should we worry?</i>
4:45 – 5:00 pm	Tyler Krutzfeldt <i>Wrap-up, Questions & Answers</i>
5:00 – 6:00 pm	Bighorn Beverages

YBRA Who's Who?

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 Past President: Jinny Sisson, University of Houston
 Vice President: John Weber, Grand Valley State Univ.
 Secretary: Laurel Goodell, Princeton University
 Treasurer: Betsy Campen, Billings, MT

Councilors

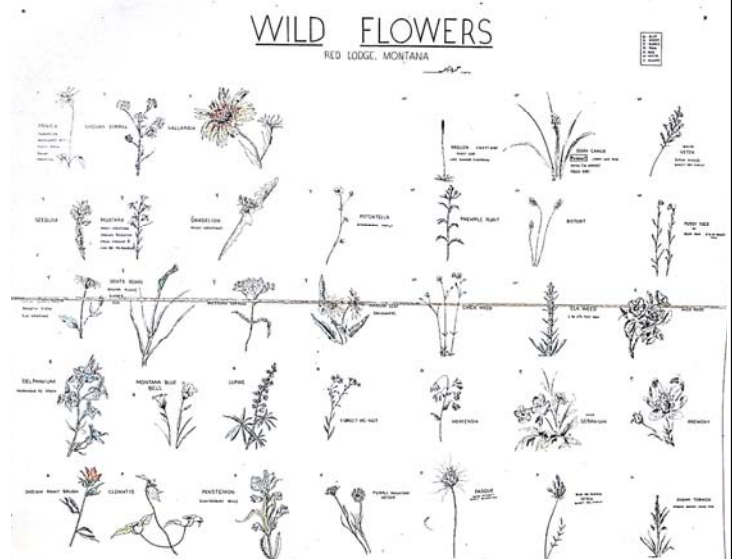
Jerry Bartholomew, University of Memphis
 James Conder, Southern Illinois University
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 Emily Ward, Rocky Mountain College
 Tom Kalakay, Rocky Mountain College
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ATTN: Proxy Enclosed