

**Long Beach City College  
Sabbatical Leave Proposal  
Academic Year 2016/2017**

**Douglas Britton, Ph.D., P.G.  
Geology**

**1. Briefly state the purpose of your sabbatical leave.**

I have two primary objectives for my proposed sabbatical leave; one is to reinforce and enhance my understanding of the geologic setting of Mexico and Central America; the second is to enhance my knowledge and understanding of the geology of eastern US, specifically within the Appalachians and the northeast US.

A student last semester (Spring 2015) enthusiastically shared some information about herself during a break early in the semester's GEOL 1 Physical Geology class; she was excited to tell me about her family's hard-rock mine in the hills outside a small vacation destination in southern Mexico. She brought pictures that she shared with me and a couple other students, and asked me what kind of mine it could be, what the geologic setting of the area was, and how it fit into the discussion of plate tectonics we were currently studying. I have a working knowledge of the regional geology of Mexico, Central and South Americas but lacked the detailed knowledge to answer her question. I hate that! I answered the best I could and promised to return in the next couple of weeks with more detail for her. When class resumed after the break, I summed up her information for the class, opened up Google Earth, and we explored the region of her family's mine. It was a great learning experience as I prompted the students to answer her questions the best they could; having the class base their interpretations on what we could discern from features visible on Google Earth, and their understanding of plate tectonics. A lively discussion and question period followed, with another student asking about a volcano near her home, also in southern Mexico. Reflecting on these two recent, but not necessarily unique, in-class experiences, I recognize a gap in my knowledge, one that given some time I could partially fill, greatly enhancing my professional growth and serving a significant population of our students at LBCC by making my courses more relevant to their life experiences.

Secondly, with the recent retirement of one of our long term geology professors, I inherited (with great anticipation) the historical geology class (GEOL 3/3H). Although the material was and is familiar to me, I acknowledge two shortcomings; 1) gaps in my knowledge and exposure to field locations discussed in the course, and 2) our department's insufficient fossil collection used in the lab portion of the course. The second shortcoming was partially resolved by a recent and significant capital outlay, however, the collection remains only adequate. All of my education has taken place in the western US; including the numerous field trips and experiences in classes as a student, field trips associated with academic conferences, and my professional work as a geologist (currently licensed in Wyoming and California). However, much of the course content for GEOL 3/3H is centered in the Midwest, south, and northeast US; classic field locations and fossil locations of the Precambrian and Paleozoic rocks are

primarily located east of the Rockies. I have no field experience in these parts of the US, and am only generally knowledgeable of the geologic setting through my own study as a student, and in preparation for teaching GEOL 3/3H.

Therefore, the purpose of my sabbatical is to:

- 1) enhance and expand my knowledge about the geology of Mexico and Central America;
  - 2) update and expand my knowledge about the geology of Eastern and Northeastern United States, specifically the plate tectonic setting and structural geology of the Appalachian regions, and;
  - 3) collect fossils to enhance our existing collection, where and when appropriate, make field observations, photograph, and document my visits to classic field locations of the Eastern US Precambrian, Paleozoic, and Mesozoic.
- 2. Give all pertinent details of your proposed plan and (3) provide your Sabbatical Timeline**

There are three major tasks detailed below to be completed during my sabbatical. The first two tasks involve a literature review of relevant texts and recent publications in geologic journals, and preparation and planning for the field investigation. The third task involves travel to, and the geologic investigation and documentation of field locations from the southern Appalachians to the northeastern Appalachians.

### **Tasks 1 Literature Review**

During the first semester (Fall 2016) of my sabbatical, I will review the recent literature and texts on the geologic setting of 1) Mexico and Central America, and 2) Eastern US. An annotated bibliography of each article or text will be prepared and included as part of my post sabbatical submittal. Additionally, copies of relevant journal articles as allowed, will be collected and preserved for other faculty to access. The following is a partial list of texts and journals I will review and include in my readings:

- 1) Ferrari, L., Pasquare, G., Venegas-Salgado, S, and Romero-Rios, F., 1999, *Geology of the western Mexican Volcanic Belt and adjacent Sierra Madre Occidental and Jalisco block*, GSA Special Paper.
- 2) Bundschatuh, J. and Alvarado, G., 2007, *Central America: Geology, Resources, and Hazards*, (Volumes 1 & 2), Taylor and Francis, London.
- 3) Ferrari, L., Orozco-Esquivel, T., Manea, V., and Manea, M. 2012, *The dynamic history of the Trans-Mexican Volcanic Belt and the Mexico subduction zone*, Tectonophysics, v. 522, pg. 122-149.
- 4) Selinus, O., et al, Editors, 2010, *Medical Geology*, International Year of Planet Earth, Springer Science + Business Media. (Specifically two chapters; *Medical Geology in South America*, and *Medical Geology in Mexico, Central America and the Caribbean*).
- 5) Ferrari, L., Valencia-Moreno, Bryan, S., 2007 *Magmatism and tectonics of the Sierra Madre Occidental and its relation with the evolution of the western margin of North America*, Geological Society of America Special Papers 422, pg. 1-39.
- 6) Hatcher, R. D. Jr., 1987, *Tectonics of the Southern and Central Appalachian Internides*, Annual Review of Earth and Planetary Sciences, v. 15, pg. 337-362

- 7) Holmes, A. E., Editor, 2015, *Diverse Excursions in the Southeast: Paleozoic to Present*, Geological Society of America Field Guides 39.
- 8) Bailey, C. M., and Coiner, L. V., Editors, 2014, *Elevating Geoscience in the Southeastern United States: New Ideas about Old Terranes*, Geological Society of America Field Guides 35.
- 9) Hoskins, D. M., Inners, J. D., Harper, J. A., 1983, *Fossil Collecting in Pennsylvania*, 3<sup>rd</sup> Edition, General Geology Report, No. 40.
- 10) Hatcher, R. D., Jr., Thomas W. A., and Viele G. W., Editors, 1989, *The Appalachian–Ouachita orogen in the United States*: in, *The Geology of North America*, vol. F–2. Boulder, CO, Geological Society of America.
- 11) Hatcher, R. D., Jr., 2005, *Geological Southern and Central Appalachians*, Elsevier Ltd. A.
- 12) Van Staal, C. R., 2005, *Northern Appalachians*, Geological Survey of Canada, Ottawa, ON, Canada, Elsevier Ltd. A.
- 13) Geological Society of America Bulletin, applicable articles
- 14) Journal of Geology, applicable articles

## **Task 2 Field Preparation and Planning**

Embarking on field excursion to visit and study type field locations in an area the size of Eastern US is a huge undertaking. The possible locations are nearly endless and are well beyond the scope of this sabbatical. To narrow down the field locations that I plan to study, I will limit the locations to areas around the two regional geologic conferences I plan to attend in March of 2017; one conference (March 16-17) in Auburn, Alabama (focusing on geology of the southern US and southern Appalachians) and another (March 19-21) in Pittsburg, Pennsylvania (a joint conference covering geology of the north-central and northeastern US, and northern Appalachians). During the first semester of my sabbatical I will also review any relevant literature (Task 1), prepare the list of possible field locations, map the route, and plan the camping locations. I'm already excited...

## **Task 3 Field Site Visits and Fossil Collection**

During the second semester (Spring 2017) of the sabbatical, I will travel to the selected field locations in the southern Appalachians, and attend the Southeastern Section of the Geological Society of America (GSA) March 16 and 17 in Auburn, Alabama. Following the southeastern section meeting I will travel north to Pittsburg, Pennsylvania and attend the Joint North-Central and Northeastern Section Meeting of GSA March 19-21. Guided field trips are components of the meetings, often preceding or following the actual meeting. If any of the field trips associated with either meeting are relevant, I will apply to attend. At this time, the details of the 2017 section meeting field trips are not outlined, so no details can be included in this proposal.

At the completion of the section meeting in Pittsburg, I will visit the selected sites in the northeastern area of the US and the northern Appalachians. As I travel back home, any other sites chosen to collect will be visited and documented (several Paleozoic fossil sites are located in Ohio, for example). I anticipate a total time of travel to be 4 to 5 weeks, beginning early March and completing by early April.

The final component of the proposed sabbatical is to catalog the fossils collected and incorporate them, as appropriate, into the existing GEOL 3/3H laboratory specimens.

#### **4. Professional Development Contribution and Relation to my Current Assignment**

This sabbatical leave gives me the opportunity to significantly enhance my knowledge of the geologic settings of Southern Mexico and Central America. With a thorough review of recent literature I can build on my working knowledge of the geology, resulting in a better incorporation of these areas into my courses and a better ability to relate to the life experiences of a significant LBCC student population.

Since I've assumed the instruction of the Historical Geology course (GEOL 3/3H), being able to actually visit and explore the geology of the eastern US and the Appalachians that play a significant role in the instruction of the class will significantly enhance my understanding and knowledge of this part of the North American Continent. Continuing to develop this knowledge will improve my field skills as a geologist and make me a better instructor for the geology classes I teach as well as for the several field geology classes we offer.

#### **5. Benefits to the College and Students**

##### **Benefit to the College**

A significant outcome of my sabbatical is that it would increase student confidence in my knowledge, abilities, and geologic skills. This reflects the quality of their education and promotes LBCC as providing a quality education.

##### **Benefit to the Students**

Following the completion of my sabbatical project, I may still not be able to quickly and directly answer a student's specific geologic question about their home or experience. But being able to incorporate the new knowledge I would gain into the course as examples or case studies when appropriate will definitely enhance student learning when I am able to better relate to their experiences.

Improving my direct knowledge and field experience of the eastern US and specifically for the areas discussed heavily in my Historical Geology course will directly benefit student learning. The improvement in our fossil collection will enhance the quality, diversity, and number of laboratory specimens.

#### **6. Tangible Products**

The following products will result from my sabbatical:

1. An annotated bibliography of relevant readings, literature, or texts that can be used as a resource for other geology instructors and geology majors.
2. Compiled copies of relevant journal articles that can be used as a resource for other geology instructors, students and geology majors.
3. Fossils collected and catalogued and incorporated into the existing GEOL 3/3H teaching collection.

## **7. How the Outcomes will be Shared**

In addition to the products listed above which would be available to the other geology instructors in the department, I will meet with them, provide a copy of the annotated bibliography, review the field investigations, and fossil collection.

## **8. Additional Sources of Employment Earnings During the Proposed Leave**

Otto Figueroa (LBCC Assistant Professor of Geology) and I are currently developing modification to our existing GEOL 7 Field Studies: Western Environments course with new field trip locations. We are offering this 2-unit class reflecting these changes for the first time during the winter intercession 2015/2016; I will also co-teach this course with Otto during the winter intercession of 2016/2017 during my proposed leave.