

To: Candy Hansen, CITD Director

From: Brandy Anglen, CITD Grant Recipient

Re: CITD funded travel to Belize

Ten Things Learned or Accomplished Through Travel

CITD grant money helped fund my travel experience to Belize from January 1, 2010 to January 6, 2010. The State Center Community College District has approved a new study abroad program to Belize for summer 2011, of which I am a lead instructor. This trip will serve two purposes: to help me prepare for this exciting new international program and to gather new educational materials to incorporate into existing geology curriculum at Fresno City College. Following are some of the things I learned or accomplished.

- 1) Belize, located south of Mexico, is on a portion of the Earth's crust that has been slowly uplifted above sea level. The result is that nearly all of the bedrock in the country is limestone, formed from ancient coral reefs. Since limestone is susceptible to chemical weathering, many areas of Belize have extensive cave systems. Many of these caves can be observed underwater, as well as on land.
- 2) Just off the eastern coastline of Belize lies the world's second longest barrier reef system, behind the Great Barrier Reef of Australia. This reef extends for nearly 200 miles from the Yucatan Peninsula (north of Belize) to Honduras (south of Belize).
- 3) The Belize barrier reef is one of the most diverse ecosystems in the world. It contains over 100 species of coral and over 500 species of fish. At present, only 10% of the reef has been evaluated by scientists, so as research continues, the types of species identified will only increase.
- 4) A significant portion of the barrier reef is protected as part of the Belize Barrier Reef Reserve system. This includes seven marine reserves, 450 cays, and three atolls, totaling over 370 square miles. Because of the unique diversity of this ecosystem, the Reserve System was designated a World Heritage Site in 1996. This designation allows the government of Belize to access extensive monetary funds to help preserve and protect this delicate ecosystem.

- 5) Despite protective measures implemented by the government and designation as a World Heritage Site, the barrier reef of Belize is facing serious threats. These include ocean pollution, uncontrolled tourism development, and fishing. In addition, increasing global temperatures has caused higher ocean temperatures which has led to more intense hurricane activity. This can lead to coral bleaching events, which have impacted nearly half of the coral species in the barrier reef system since 1998. Coral bleaching results in the polyps that sustain the reef to die but can also make the polyps that survive more susceptible to disease and predators.
- 6) The Belize barrier reef system is also threatened by invasive marine species, such as the lionfish, *Pterois volitans*. The lionfish is native to the Indian-Pacific Ocean area but has been introduced to all tropical areas. It is known for its voracious appetite and its ability to establish itself in an area at the expense of other fish species. Since lionfish are not native to the coastal waters of Belize, the endemic species of fish have no defense against this predator. Many fish species are in danger of going extinct if lionfish populations are not controlled, if not eliminated. While the origin of these invasive lionfish is unclear, officials suspect that they may have been introduced by home or business aquariums that are destroyed in hurricanes.
- 7) One of the unique species of coral found in the barrier reef system is *Dendrogyra cylindricus*, commonly known as pillar coral. This hard coral is unique to the Caribbean and can not be found anywhere else in the world. The most interesting feature of this coral is that the polyps are extended during daylight hours, while nearly every other species of coral has their polyps extended at night. The extended polyps give the coral a “fuzzy” appearance but also allow researchers to actively observe the coral feeding.
- 8) The Garinagu are an ethnic group found in Belize and other Central American countries. They are descendants of Carib and West African people that were brought to Central America through the slavery trade beginning in the 1600’s. They are a culturally-rich group, but are most commonly known for their drum music. These

- 9) Belize is home to many important sites from the Maya civilization, dating back nearly three thousand years. I was fortunate to visit one of these sites called Lamanai. This site was occupied as early as 1600 BCE and may have had a population of nearly 50,000 at one time. Archaeological work began in the mid-1970's and has focused on the larger structures of the site, including the Mask Temple and the High Temple.
- 10) During the entire trip, I learned valuable information for planning student travel programs in Belize. While staying at an educational research station in San Pedro, I was fortunate enough to meet several faculty from colleges around the United States who have taken student groups on educational trips to Belize. They were an invaluable source of detailed information on sites or locations to visit, how to manage logistics of a large group of students, how to tailor coursework to an international location, along with many other details of planning study abroad trips. This was information one simply can not get from a guidebook or an internet resource.

I will present my travel experience at a Cross Campus Colloquium and/or at a presentation for Flex Day activities on the Fresno City College Campus on a date to be determined.