Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

#152 February 22, 2014
Perils of Foreign Ports

View up the Lijiang River.

Shanghai has been described by my good friend, Sandy Lydon, as Las Vegas on steroids. If you arrive at night, the lighting on the dozens of architecturally interesting and increasingly taller skyscrapers definitely is over the top. Colored light shows, images in lights, advertising, it's all there like Las Vegas or Times Square; but it's China.

Although we arrived at night, this wasn't the captain's plan. The ship was supposed to anchor at 8:00 am in order to maximize our time in port. But there were some unplanned surprises.

Virtually every port and harbor around the world has licensed pilots who know the navigation routes inside and out and who have responsibility for making sure each ship reaches the dock safely.

For Shanghai, there is a long route up the Yangtze River, and lots of shallow water where an unsuspecting captain could run a ship aground. The pilot meets the ship just offshore and then guides the captain and ship for miles and hours up the river

channel to the port terminal. There are two pilot stations for Shanghai, however, and communication was confused so we waited for a pilot who never came. He was waiting at the other station.

By the time the miscommunication was discovered, the tide had gone out, leaving the channel too shallow for the MV Explorer to navigate. Coastlines around the Pacific Ocean have two high and two low tides each day, so we had to wait nearly 12 hours for the next high tide to raise the water level. You really can't rush the Earth in its daily rotation, nor change the position of the moon.

This did create havoc for all of the overland trips that were supposed to depart from the ship at 9:00 that morning, including one that I was scheduled to lead to Zhujiajiao, a water village of Shanghai with a history extending back over 1700 years.

But the sea waits for no person, and the tide had to go out and come back in again. What it did mean was that we arrived at 8:00 that night when the skyline was completely illuminated, rather than 8:00 am when the skyscrapers would have had much less personality.

I had a second trip to lead that did depart the next morning with 28 people bound for Guilin. This is the mountainous area depicted in so many Chinese paintings that looks like it came out of a Dr. Suess book, dozens of tall rounded peaks which the Lijiang River passes through in dreamlike scenes.

This is typical karst terrain, which forms in limestone, and which was originally named after the karst region of former Yugoslavia. A large area of what is now southern China was covered with an ocean about 300 million years ago, and thousands of feet of calcium carbonate accumulated on the floor of that ancient ocean, primarily from the shells of gazillions of microscopic plankton, which populated the surface waters for millions of years.

Over the subsequent centuries of sediment compaction, continental collisions and uplift, the sediments were converted to limestone and elevated to form mountains. The stress of uplift created cracks and fractures in the rocks, and because limestone dissolves in acid, the slightly acidic groundwater flowing along these cracks began to create valleys at the land surface, and also dissolved caves in the subsurface.

As the valleys grew deeper and deeper over time, these bizarre Dr. Suess mountains stood higher and higher above the surrounding landscape. Today the

Lijiang River winds magically through these fairy tale mountains, which is a geologist’s paradise. We took a 35-mile, six-hour boat trip down the river. While the temperatures hovered close to freezing all day, it wasn’t enough to keep us from staying out on deck taking a lot of photographs. Every bend in the river brought a new set of peaks that seemed more interesting than those we had just passed.