

Craftsbury geology 6-13-12

by Julia Shipley

CRAFTSBURY — Forty people stood along the lower end of Post Road next to the Black River in Craftsbury Saturday as Agency of Natural Resources geologist and environmental scientist Jonathan Kim explained what the group was about to witness.

“You know when you have a boondoggle, a yarn that’s become twisted and knotted on itself, and you’re debating whether or not to throw it out — well, that’s what the geology is here,” Mr. Kim said. “And as geologists, our job is to untangle it.”

Mr. Kim and professor George Springston told the group about some of the most basic findings discovered through their 2010 fieldwork mapping both the bedrock and glacial geology of Craftsbury. Mr. Springston is from Norwich University, and his area of expertise is glacial geology.

At the most fundamental level, the two men explained, one side, the east side of Craftsbury, has really old rock — the 410- to 380-million-year-old (Devonian era) Waits River Formation. The other side of Craftsbury, the west side, has even older rock, the 500-million-year-old (Cambrian era) Moretown Formation. There’s a seam where these two rock formations converge, and Route 14 runs through it.

On the field trip, which was organized by the Craftsbury Conservation Commission, Mr. Kim and Mr. Springston presented some of their most informative findings and took participants to places where the geological history of the area could be “read” most clearly.

Mr. Kim and Mr. Springston spent the summer of 2010 mapping the geology of Craftsbury, with Mr. Kim focusing on bedrock and Mr. Springston examining glacial features. The mapping was part of a project funded through the Vermont Geological Survey. Results of the project include new bedrock and surficial geologic maps of Craftsbury and a groundwater resource map, which are available to the public.

On Saturday, the group traveled by van and motorcade to six sites on both sides of Route 14. Mr. Kim and Mr. Springston showed people examples of glacial scratch marks, settled glacial lake silts displayed like tree rings, buckled pinstriped rock, a 70-foot high glacial esker the town mines to maintain the roads, and a granite

so rare it is only found in two other places in the world.

The Craftsbury Geology Project began in 2007 when the Craftsbury Conservation Commission reached out to Vermont State Geologist Lawrence Becker to request assistance collecting as much information on Craftsbury’s natural resources as possible, including aquifer mapping. Through Mr. Becker, the commission learned of, and applied for, a grant funded by the Vermont Geological Survey (VGS) to map Craftsbury’s groundwater systems.

In the VGS’s long-range plan published in 2007, it’s noted that an estimated 66 percent of Vermonters use groundwater for their water supply. VGS’s mapping grant was designed to help towns to understand the surficial and bedrock geology as a base for defining and protecting groundwater resources.

The new maps, resulting from the data collected during the fieldwork, were repeatedly held up against the hood of the van throughout the field trip for participants to examine. The maps show both the bedrock and surficial geology of Craftsbury, as well as groundwater resources indicating potential aquifers, recharge areas, groundwater flow directions, and water quality and chemistry. They are the products of diligent research — Mr. Kim and Mr. Springston visited between 300-500 sites throughout the town. However, what the maps don’t convey is the enthusiasm both men expressed about the complicated geologic story demonstrated last Saturday.

Standing in the north end of Craftsbury by the remnants of the glacial Lake Winooski, Mr. Springston said, “Imagine this lake... 12,000 years ago. The summer layers, several inches thick, form when the glacier is melting and sediment is flushed out. Now it’s January. The glacier is accumulating snow; the melt water system is shut down; there’s no more sediment pouring out. The very fine material that stayed in suspension all summer begins to settle out, and the materials form a thin dark layer. The records of these layers are called varves.”

Mr. Springston then asked the group, “Is this clay?”

To answer, he pinched a bit and skidded it between his forefinger and thumb to demonstrate its claylike smear-ability. Then he rolled a little chunk between his palms to see if it turned into a noodle. It did. Last, he tasted it, and his palate

told him: “Yup, clay.”

Later the group stood on the south end of town, in front of a rock outcrop pinstriped with layers of black micas and white quartz which looked like a soaked paperback book that buckled and warped as it dried. Mr. Kim invited participants to consider this boondoggle of a rock that he has begun to unravel. He demonstrated with a piece of paper — folding it and folding it and then crunching it to explain the “deformations” of rock through millennia. While the group examined the intricate layers of this Moretown Formation under his ten-power lens, Mr. Kim warned, “From here, this layer of rock dives out of sight. You’ll never see the Moretown Formation again until it rears up near the Connecticut River.”

It seemed participants’ understanding also went in and out of focus, roller-coastering from “aha” to “huh?” and back to “aha” as the tour proceeded through all six sites.

David Mitchell, a part-time resident of Hardwick, who also teaches high school science in Dallas, Texas, liked the challenge of trying to understand it all. He said he found the tour and the complexity of this area’s geology exciting. “This landscape’s been smashed and cooked,” he said, as compared to Texas where, “it’s all sedimentary layers, like a stack of pancakes.”

The physical maps are on display at the Craftsbury Town Office. Or visit electronic versions at:
www.anr.state.vt.us/dec/geo/images/.../CraftsburySurfMap.pdf and
www.anr.state.vt.us/dec/geo/mapsonlineinx.htm.

Jonathan Kim. Photos by Julia Shipley

George Springston