Series of Maps Showing the Evolution of Mapping Yellowstone Lake During the Past 130 Years, 1871–2002

Index map showing the location of Yellowstone National Park and Yellowstone Lake (blue) within the Park. The topographic margin of the Old Faithful caldera is shown by the dashed line, which extends through the south-central part of the lake. Major fault zones are represented on this print line and include TFL, Teton fault zone; ETB, Eagle Butte fault zone; BR, Battle River fault zone; and GRB, Gros Ventre fault zone, and the dates, 1877, 1889, and 1892, along with the names of the surveyors, L.H. Lathrop, R.S. Hoyt, W.B. Lister, E.C. Twedt, H.C. Jones, and J.B. Deardorff, respectively. The names of the surveyors on the map are: GR, George Roberson; RF, Robert F. Marion; MM, Marion Marion; BS, Butte Survey; IT, Izaak Walton; WP, West Park; and DR, Discovery Range. The six main basins marked with yellow shading along the western margin of the lake are: West Thumb, Oxbow Bend, Madison (south basin), Firehole, Lewis, and Yellowstone. The yellow shaded basin on the northeast corner of the lake is hiding a fault between the two basins.

Map of Yellowstone Lake and geology around the lake as mapped in the Hayden survey (1873).

Bathymetric map of Yellowstone Lake by Captain T. Kimball (1881).

The lake was very weathy. The water covers in areas equal to several acres in the sand point. At that time the water was quite cold and the scarcity of fish was evident. At the time, the main source was so strong that most fish could not be caught off and removed from the top of the lake.

Maiden survey, August 19, 1871.

Survey boat, The Anvil, with James Stimson (left) and Chester Dennys on July 28, 1871. Photo taken by W.H. Jackson.

EXPLANATION

New high-resolution bathymetric maps shown as blue-shaded relief maps of Yellowstone Lake, acquired by multibeam sonar imaging, surrounded by a colorized geologic map of the area around Yellowstone Lake (U.S. Geological Survey, 2012). The map area of the lake shown comprises unknown features, such as an 800-m-wide hydrothermal explosion crater (New Lake), a 700-m-wide explosion crater north of Frank Island, and numerous hydrothermal vents, hydrothermal island terraces, landslide deposits, and hydrothermal lakes. New Lake has an elevation 7 to 10 m of postglacial sediments in West Thumb basin (Morgan and others, 2002; Johnson and others, 2002). Oxbow and others, 1971). In the northern basin, large hydrothermal explosion craters in Marys Bay and mouth of Bear River, numerous smaller craters related to hydrothermal vents, landslide deposits along the eastern margin of the lake near the caldera margin (Fig. 1), and postglacial rhyolitic lava flows shape the lake basin. Glacial deposits (shown in the northern basin in order to emphasize the postglacial rhyolitic lava flows) are present throughout the lake and mantle the lake floor. Features west of Shoshone Basin and the geothermal north of Yellowstone Island may be related to extension along the young Eagle-Rock Rift (see Fig. 1B).