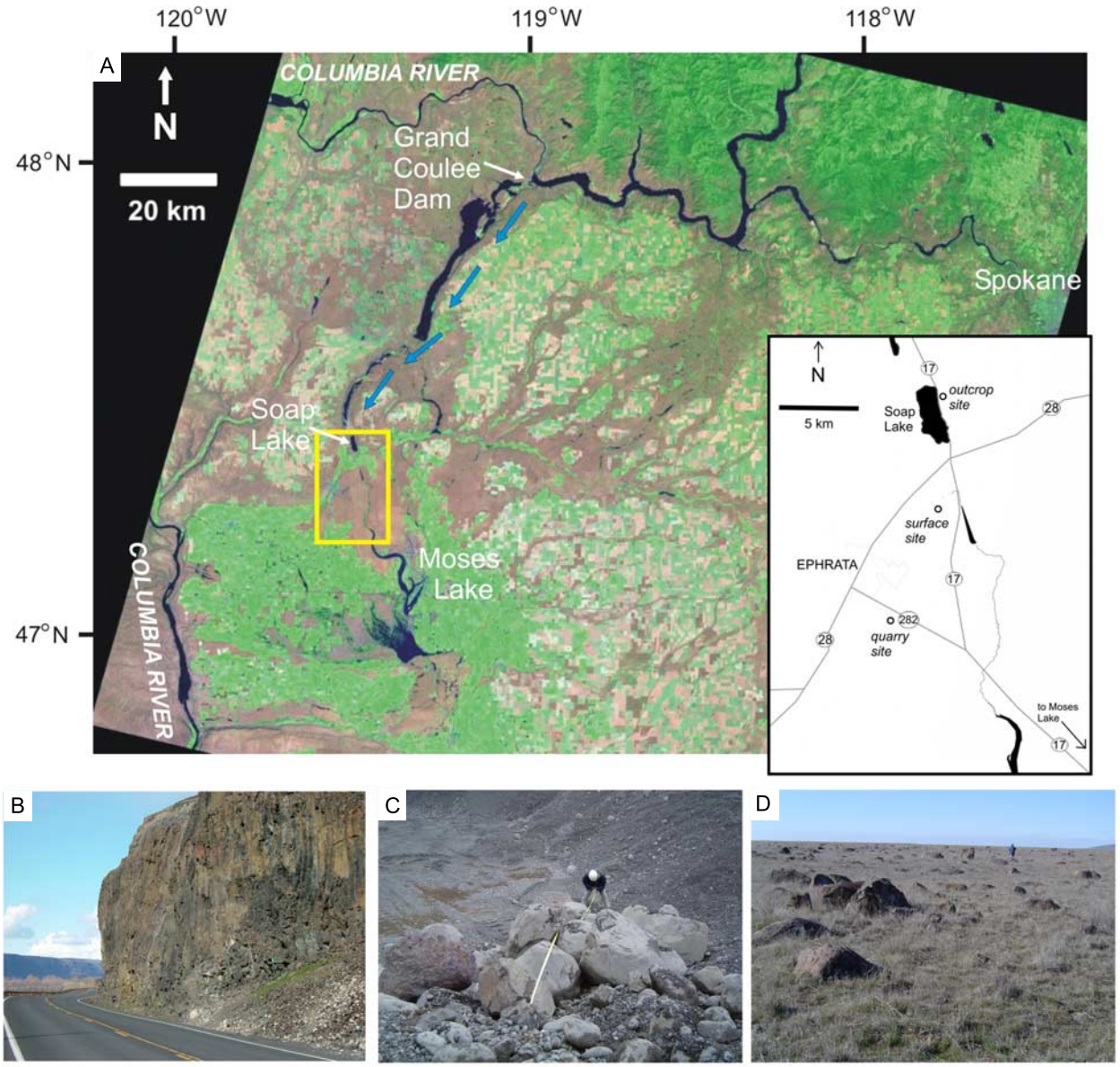

Figure 1. (a) False color Landsat image (bands 5, 4, and 3 are red, green, and blue, respectively, image ELP044R027_7T19990723) of the Channeled Scabland. Arrows indicate the path of floodwaters through Grand Coulee during the last Lake Missoula breakout event. The Ephrata Fan boulder deposits at the distal end can be recognized on the satellite image by the lack of agricultural fields. Box indicates the location of the inset, a schematic map of the locations of sampling sites. (b) Basalt outcrop at the eastern shore of Soap Lake with vertical columnar jointing. (c) Boulders piled during excavation at the Ephrata gravel quarry site, and (d) the Ephrata Fan boulder field at the surface site.

[10] Crystalinity, vesicularity, and composition vary relatively little between flow units, allowing the first-order assumption that intersite and intrasite differences in parent flow unit are of negligible importance to breakdown processes and morphology of boulders of the CRB [*Hooper*, 2000]. The greatest source of variation is the stratigraphic location of source rock within a flow unit. Differences in depth during cooling and consequent fracturing created a classic stratigraphy found in numerous basalt flows: a basal pillow-palagonite complex overlain by a "colonnade" unit of well-ordered hexagonal columns, capped by a less-ordered "entablature" of irregular columns and additional cooling fractures [*Long and Wood*, 1986; *Aydin and Degraff*, 1988].

2.2. Quaternary Geomorphic History and Climate

[11] Loess and alluvial deposits from glacial outwash were deposited over the CRB in the Quaternary, and 17,000–12,000 years ago, the Columbia and Snake River plains were reshaped in a series of outburst floods from glacial Lake Missoula [*Bretz*, 1923; *Baker and Nummedal*,