

surveys, and some patterns are polygonal in shape. We assumed that these linear patterns are associated with deeper structures in the earth's crust. For example, the inner and outer shape of the Quaternary Kakuto caldera depicts a hexagonal pattern in land surveys. Recent Ebino earthquakes are considered a result of deep activity of the Kakuto cauldron. Consequently, some linear patterns may be polygonal in shape, and may reflect calderas on the surface or unexposed cauldrons in the deep.

Many epithermal deposits in the world are associated with cauldrons and intrusive igneous rocks. Therefore, we assume the following: (1) linear patterns from satellite images can reflect the earth's crust fracture system; (2) the linear patterns that reflect cauldrons and intrusives can show some polygonal shapes; and (3) ore-forming fluids that form epithermal ore deposits are transported under the control of fracture systems and, hence, force the sites of the epithermal ore deposits to be near the fracture systems.

If these assumptions are correct, then sites of epithermal ore deposits should be strongly associated with polygonal linear patterns as shown by satellite images. When distributions of known epithermal gold deposits in southern Kyushu are overlain on the map of linear patterns from satellite images, many polygonal linear patterns are observed near known deposits, suggesting that these three assumptions are correct. Moreover, a few polygonal linear patterns that are not associated with known deposits should be prospected for mineral economics.

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#### Polygonal Linear Patterns from Satellite Images and Epithermal Gold Deposits in Southern Kyushu, Japan

Remote-sensing image data from Landsat series satellites show some advantages over land surveys, as follows: (1) synchronous (at the local time during 9:30-10:30) and wide-scale area ( $180 \times 180$  km); (2) repeatability (every 16-18 days); and (3) multispectral bands (4 bands of visible and near-infrared for Multispectral Scanner, MSS, and 7 bands of visible to infrared for Thematic Mapper, TM).

One disadvantage is the relatively low resolution ( $79 \times 79$  m for MSS, and  $30 \times 30$  m for TM). Several MSS images of southern Kyushu have been studied to extract linear patterns through digital processings. Comparing the enhanced results, many linear patterns are visible and confirmed by ground