

地すべりとは

What is a Landslide?

「地すべり」とは、斜面の一部がすべり面上を斜面の下の方に、もとの形をとどめながら移動してゆく現象です。それに対して、「がけ崩れ」は、急な斜面の一部がすべり面を持たずに急激に崩れ落ちる現象です。

A landslide is a phenomenon in which part of a slope moves downward on a slip surface while retaining the original shape of the soil mass. Slope failure, in contrast, is a phenomenon in which part of a steep slope suddenly fails without a slip surface being involved in the movement of soil.



▲新潟県上越市で発生した地すべり
Landslide in the City of Joetsu, Niigata Pref.



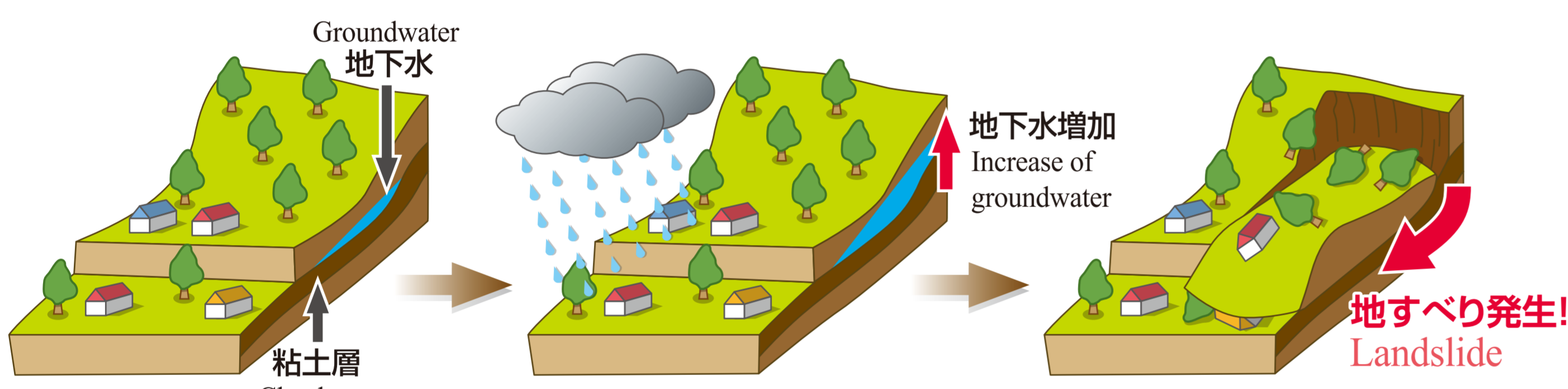
▲すべり面
Slip surface

地すべりの起こり方

Landslide Mechanisms

地盤の中に水を含むと強さが低下する軟弱な層（粘土層など）が存在する斜面では、豪雨や長雨、急激な雪解けなどにより過剰な地下水の供給が生じた時、その層の強さの低下により地すべりが起こりやすくなります。また、このような斜面では、斜面の下部を切り土したり上部に盛り土したりする工事をした場合にも、斜面のバランスが崩れ、地すべりが起こりやすくなります。この他、地震の揺れでも地すべりが起こりやすくなります。

Slopes that consist at least partly of soft ground, such as a clay layer, are prone to landslides. This kind of soft layer weakens when its water content increases. When groundwater is supplied excessively to such a soft layer after intense rainfall, prolonged rainfall or accelerated melting of snow, the soft layer becomes much weaker, inducing a landslide. A landslide also occurs when earth is cut from the bottom of the slope or when fill is added to the top of the slope, because such engineering works upset the balance of the slope. Earthquakes can also induce landslides.



▲主な地すべりの起こり方
Mechanisms of major types of landslides

地すべりが起こりやすい所

Landslide-prone Locations

地すべりは、特定の地質や断層の所で数多く発生しています。風化しやすく固結度が低い約3,000万年前にできた第三紀層の泥岩などが分布する新潟県、富山県などや、大きな断層などにより破碎された地層が分布する徳島県、長野県などでは、地すべりが起こりやすいため数多く発生しています。

Landslides often correlate to specific geological conditions and faults. For example, many landslides have occurred in Niigata and Toyama prefectures, which are widely distributed with Tertiary deposits, such as mudstone, that formed about 30 million years ago. Being characterized by a low level of consolidation, these Tertiary deposits are easily weathered. Tokushima and Nagano prefectures have also experienced many landslides due to their characteristic geological strata that have been fractured by large faults.



▲地すべりが分布している所 (図中の黒点は地すべり)
Distribution of landslides (black dot = landslide)

地すべりの地形

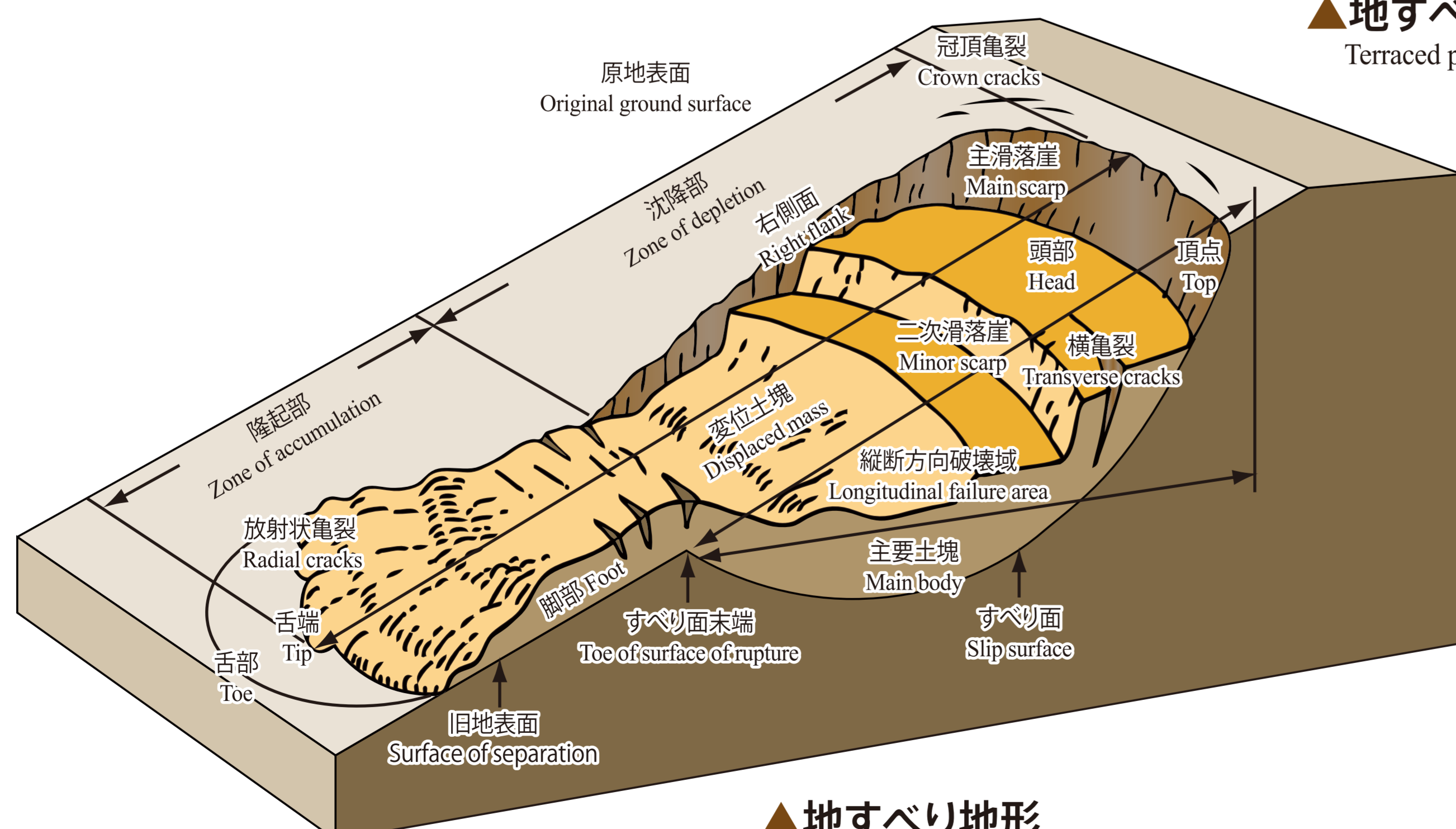
Landslide-prone Topography

地すべりが起こった所は、特徴的な地形をしています。地すべりの頭部には半円状の急斜面や崖があり、その直下に陥没地や平坦地があります。この地すべり地形の特徴をもとに、地すべりの恐れがある箇所が分かる地すべり分布図が作成されています。また、地すべりは、その地形内で更に幾つもの地すべりが起こり階段状の地形となります。この地形を利用して、棚田や千枚田などが作られています。

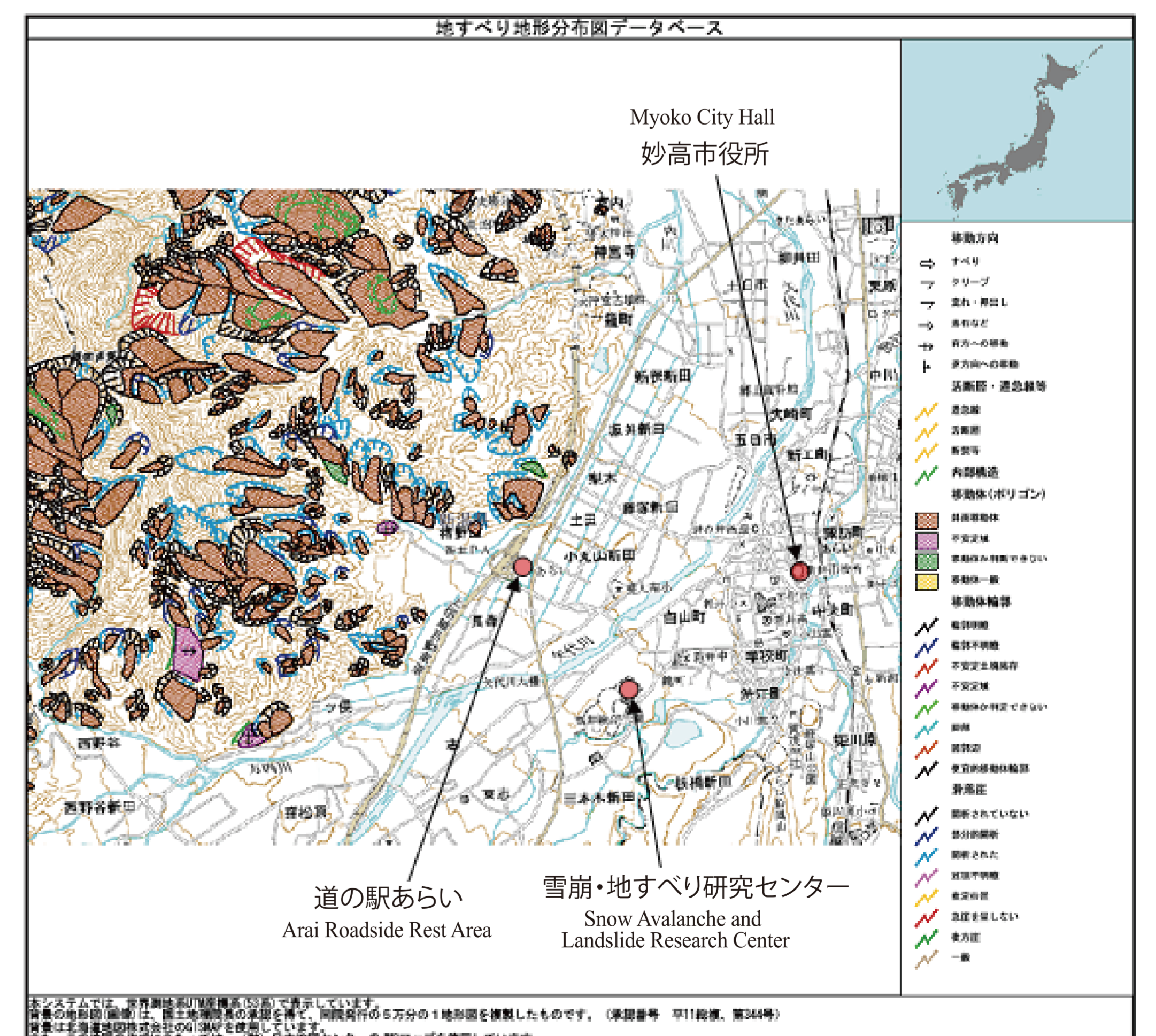
Landslides are associated with a distinctive topography. The head of the landslide zone tends to lie at a semicircular cliff or steep slope immediately above a depression or flatland. Landslide maps identify this topographic feature as a landslide-prone location. A landslide is often followed by other landslides in the same topographic area, which results in the formation of stepped terrain. This terrain has been used for developing stepped or terraced paddy fields.



▲地すべり地形を利用した千枚田
Terraced paddy fields created from landslide topography



▲地すべり地形
Landslide topography



▲雪崩・地すべり研究センター付近の地すべり分布図
(防災科学技術研究所による)

<http://lsweb1.ess.bosai.go.jp/>

Landslide distribution around the Snow Avalanche and Landslide Research Center
(prepared by the National Research Institute for Earth Science and Disaster Prevention)