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LANDSLIDE GLOSSARY

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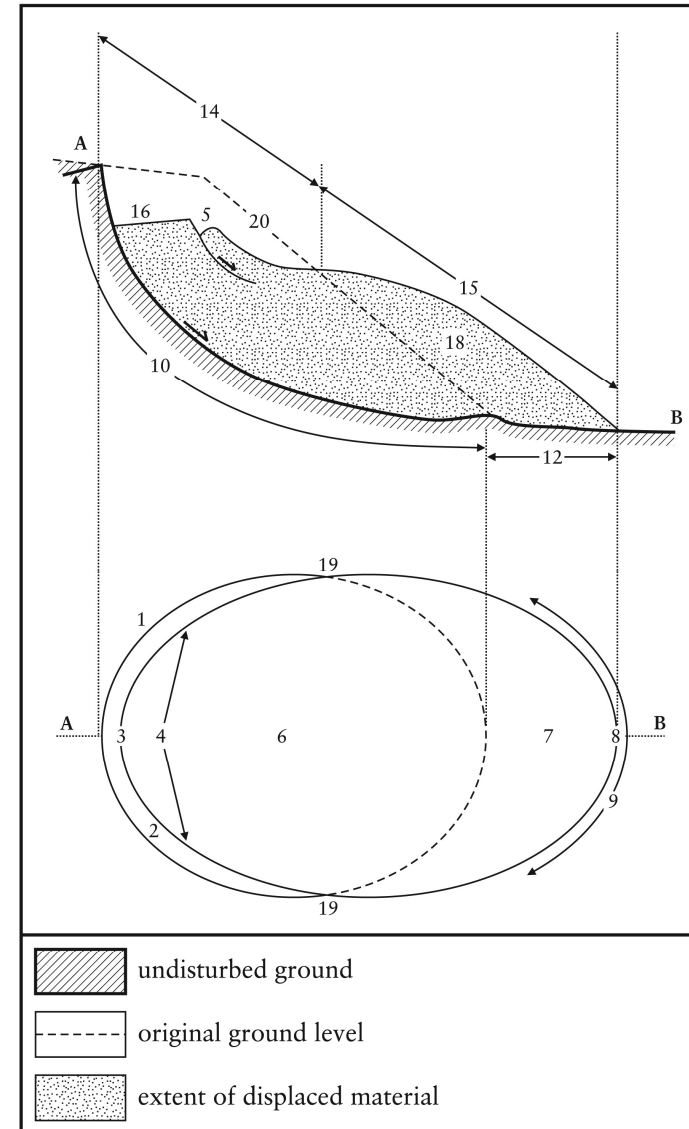
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LANDSLIDE GLOSSARY

Multilingual Landslide Glossary (Cruden & Varnes (1996))

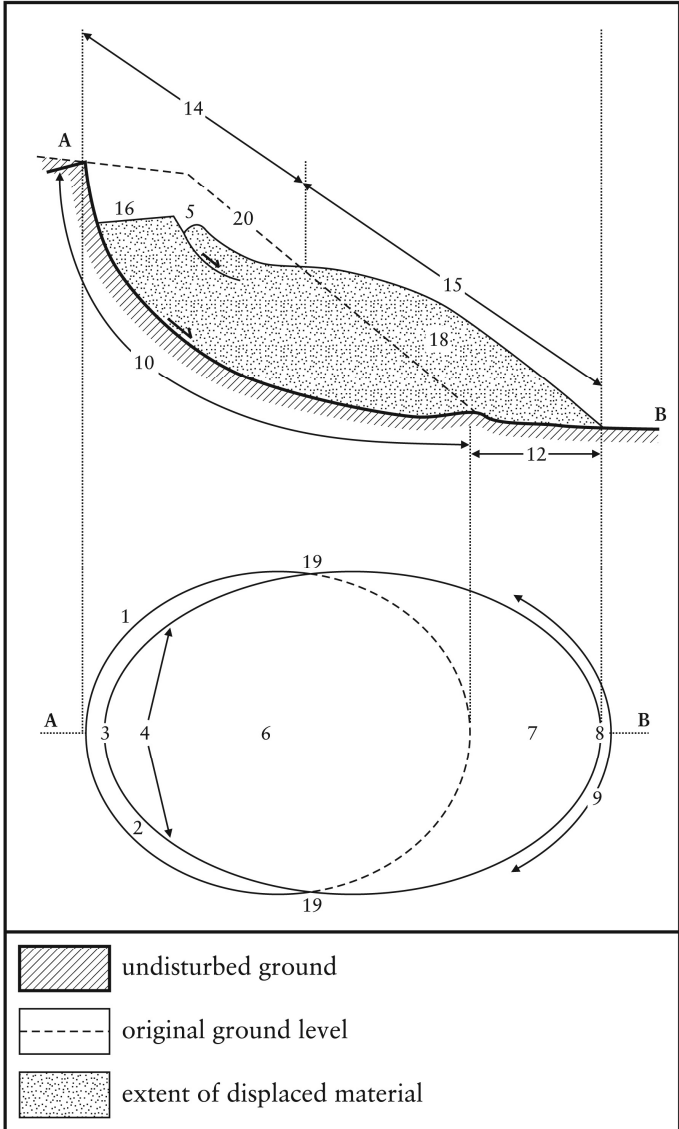
1. **Crown:** The practically undisplaced material still in place and adjacent to the highest parts of the main scarp.
2. **Main Scarp:** A steep surface on the undisturbed ground at the upper edge of the landslide, caused by movement of the displaced material away from the undisturbed ground. It is the visible part of the surface of rupture.
3. **Top:** The highest point of contact between the displaced material and the main scarp.
4. **Head:** The upper parts of the landslide along the contact between the displaced material and the main scarp.
5. **Minor Scarp:** A steep surface on the displaced material of the landslide produced by differential movements within the displaced material.
6. **Main Body:** The part of the displaced material of the landslide that overlies the surface of rupture between the main scarp and the toe of the surface of rupture.
7. **Foot:** The portion of the landslide that has moved beyond the toe of the surface of rupture and overlies the original ground surface.
8. **Tip:** The point of the toe farthest from the top of the landslide.
9. **Toe:** The lower, usually curved margin of the displaced material of a landslide, it is the most distant from the main scarp.



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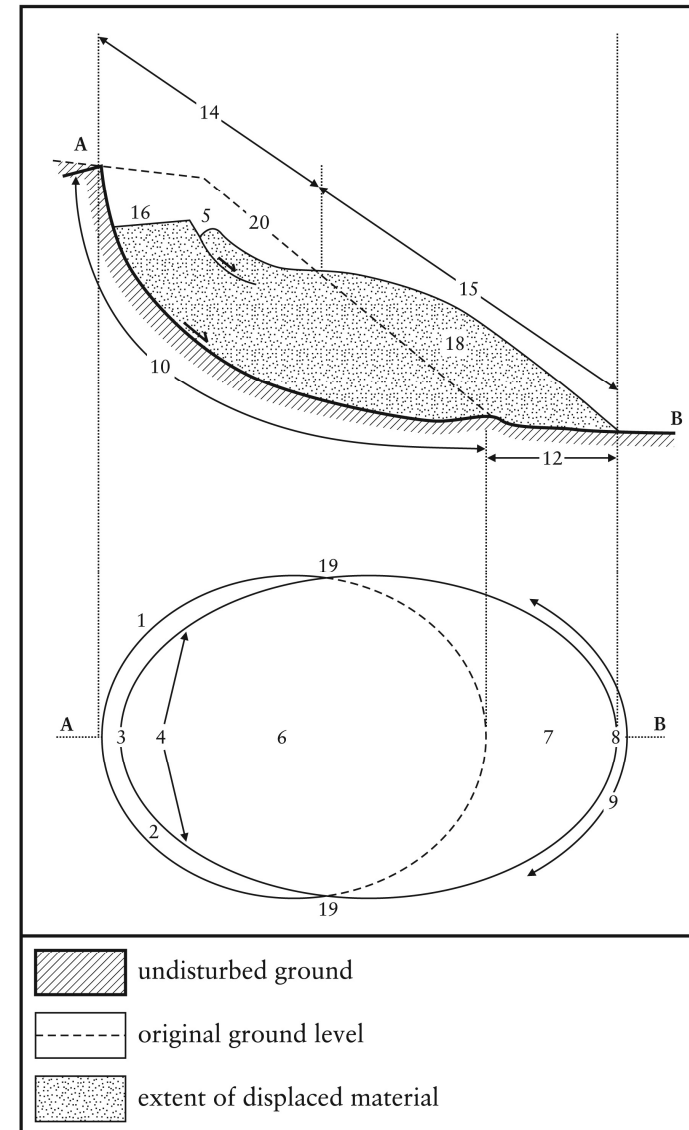
- 10. Surface of Rupture:** The surface which forms (or which has formed) the lower boundary of the displaced material below the original ground surface.
- 11. Toe of the Surface of Rupture:** The intersection (usually buried) between the lower part of the surface of rupture of a landslide and the original ground surface.
- 12. Surface of Separation:** The part of the original ground surface overlain by the foot of the landslide.
- 13. Displaced Material:** Material displaced from its original position on the slope by movement in the landslide. It forms both the depleted mass and the accumulation.
- 14. Zone of Depletion:** The area of the landslide within which the displaced material lies below the original ground surface.
- 15. Zone of Accumulation:** The area of the landslide within which the displaced material lies above the original ground surface.
- 16. Depletion:** The volume bounded by the main scarp, the depleted mass and the original ground surface.
- 17. Depleted Mass:** The volume of the displaced material, which overlies the rupture surface but underlies the original ground surface.



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- 18. Accumulation:** The volume of the displaced material, which lies above the original ground surface.
- 19. Flank:** The undisplaced material adjacent to the sides of the rupture surface. Compass directions are preferable in describing the flanks but if left and right are used, they refer to the flanks as viewed from the crown.
- 20. Original Ground Surface:** The surface of the slope that existed before the landslide took place.

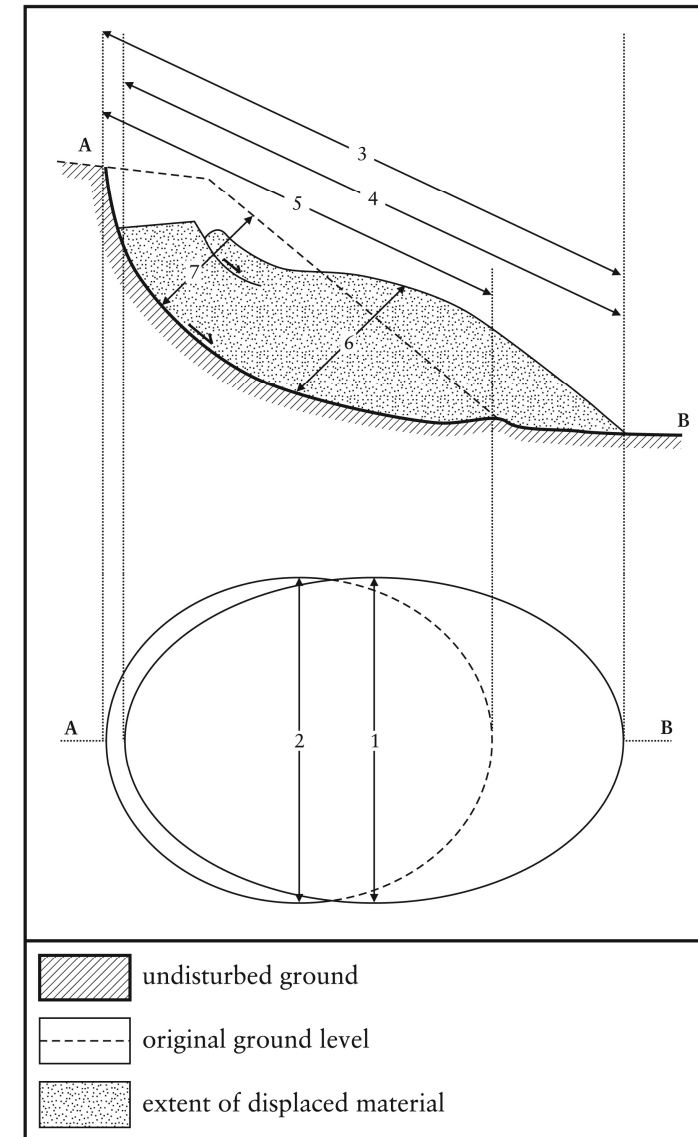


LANDSLIDE GLOSSARY

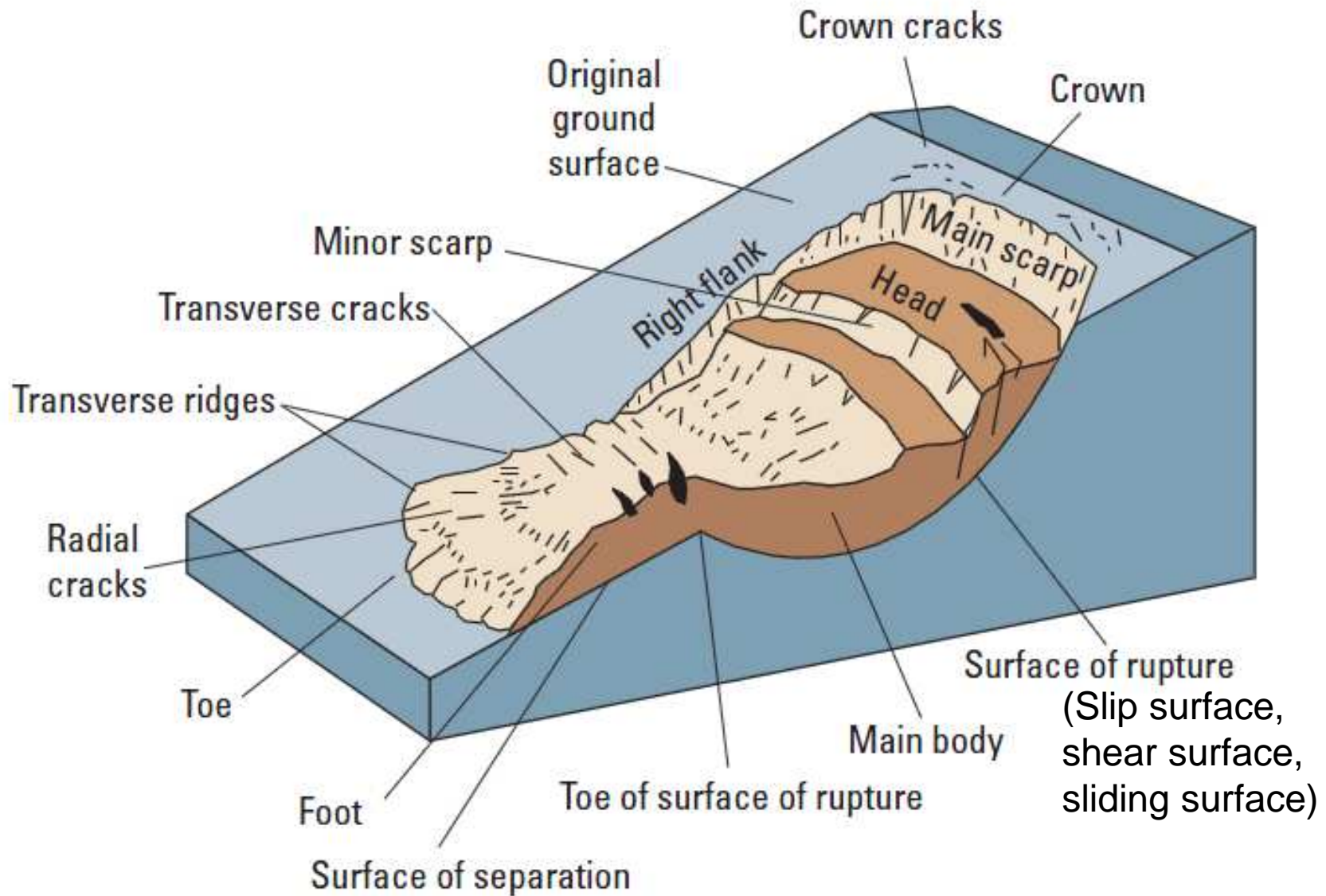
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Landslide dimensions

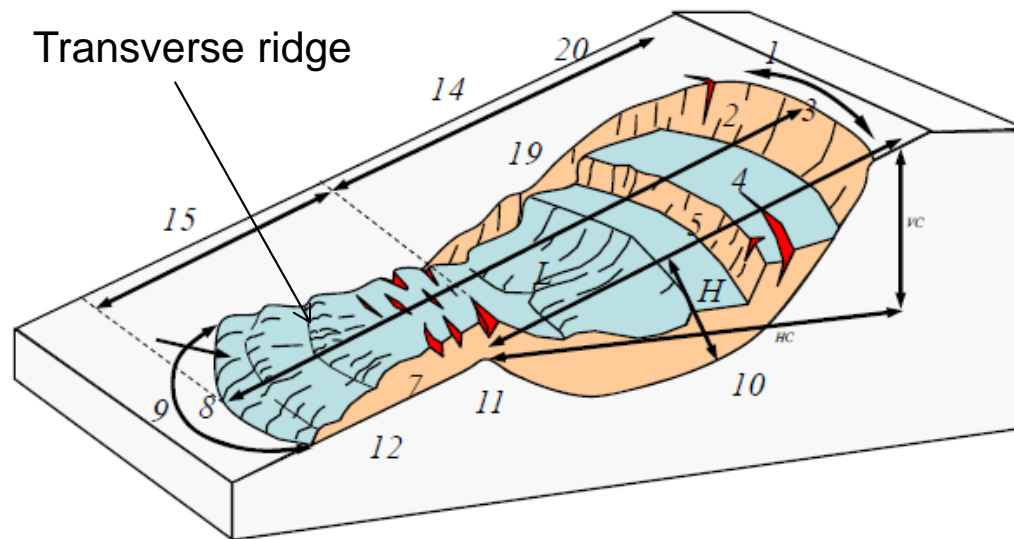
- 1. Width of the Displaced Mass:** The width of the displaced mass, W_d , is the maximum breadth of the displaced mass perpendicular to the length of the displaced mass, L_d .
- 2. Width of the Rupture Surface:** The width of the rupture surface, W_r , is the maximum width between the flanks of the landslide, perpendicular to the length of the rupture surface, L_r .
- 3. Total length:** The total length, L , is the minimum from the tip of the landslide to the crown.
- 4. Length of the Displaced Mass:** The length of the displaced mass, L_d , is the minimum distance from the tip to the top.
- 5. Length of the Rupture Surface:** The length of the rupture surface, L_r , is the minimum distance from the toe of the surface of rupture to the crown.
- 6. Depth of the Displaced Mass:** the depth of the displaced mass, D_d , is the maximum depth of the displaced mass, measured perpendicular to the plane containing W_d and L_d .
- 7. Depth of the Rupture Surface:** The depth of the rupture surface, D_r , is the maximum depth of the rupture surface below the original ground surface measured perpendicular to the plane containing W_r and L_r .



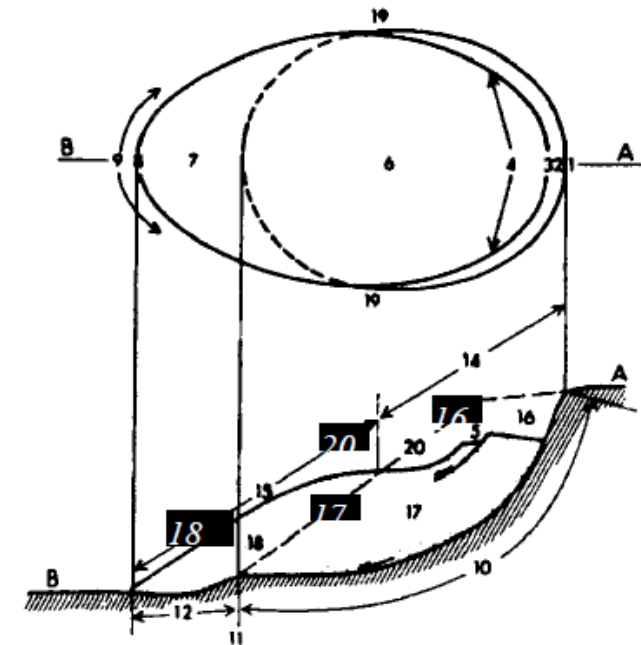
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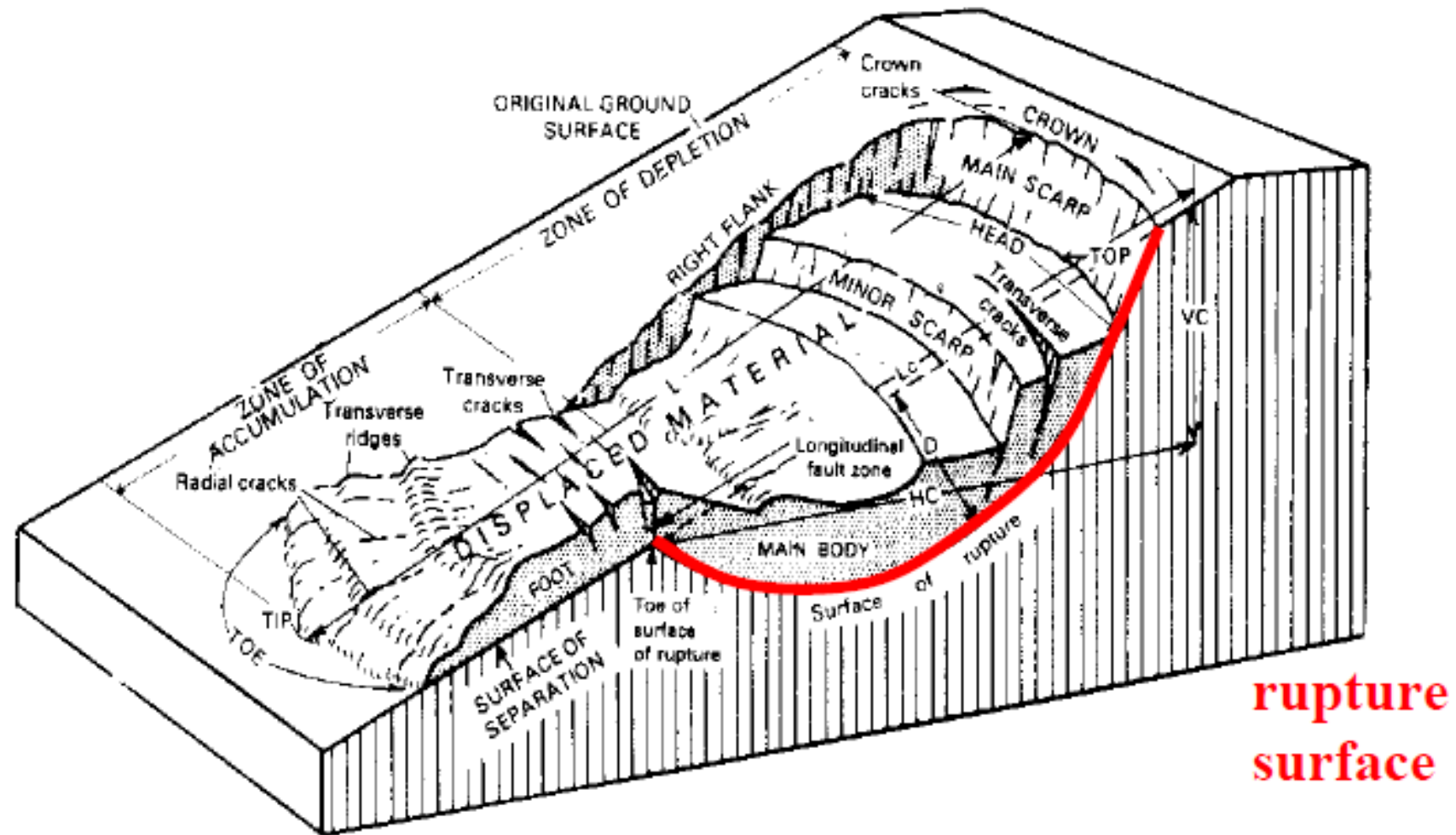
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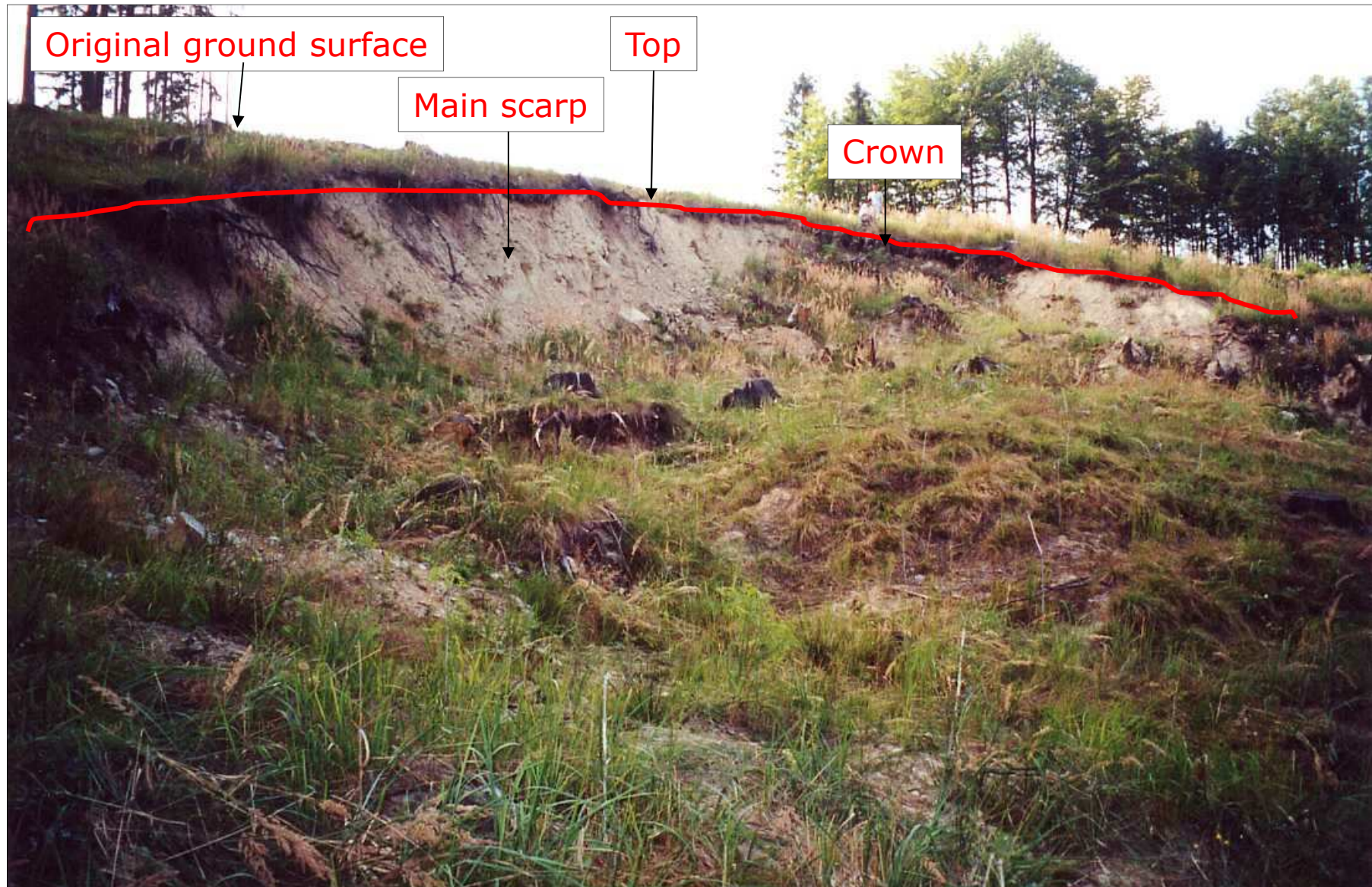
- | | |
|---------------------|----------------------------|
| 1. Crown | 11. Toe of failure surface |
| 2. Main scarp | 12. Surface of separation |
| 3. Top | 13. Displaced mass |
| 4. Head | 14. Zone of depletion |
| 5. Secondary scarp | 15. Zone of accumulation |
| 6. Main body | 16. Depletion |
| 7. Foot | 17. Depleted mass |
| 8. Tip | 18. Accumulation |
| 9. Toe | 19. Flank |
| 10. Failure surface | 20. Pre-failure topography |



LANDSLIDE GLOSSARY



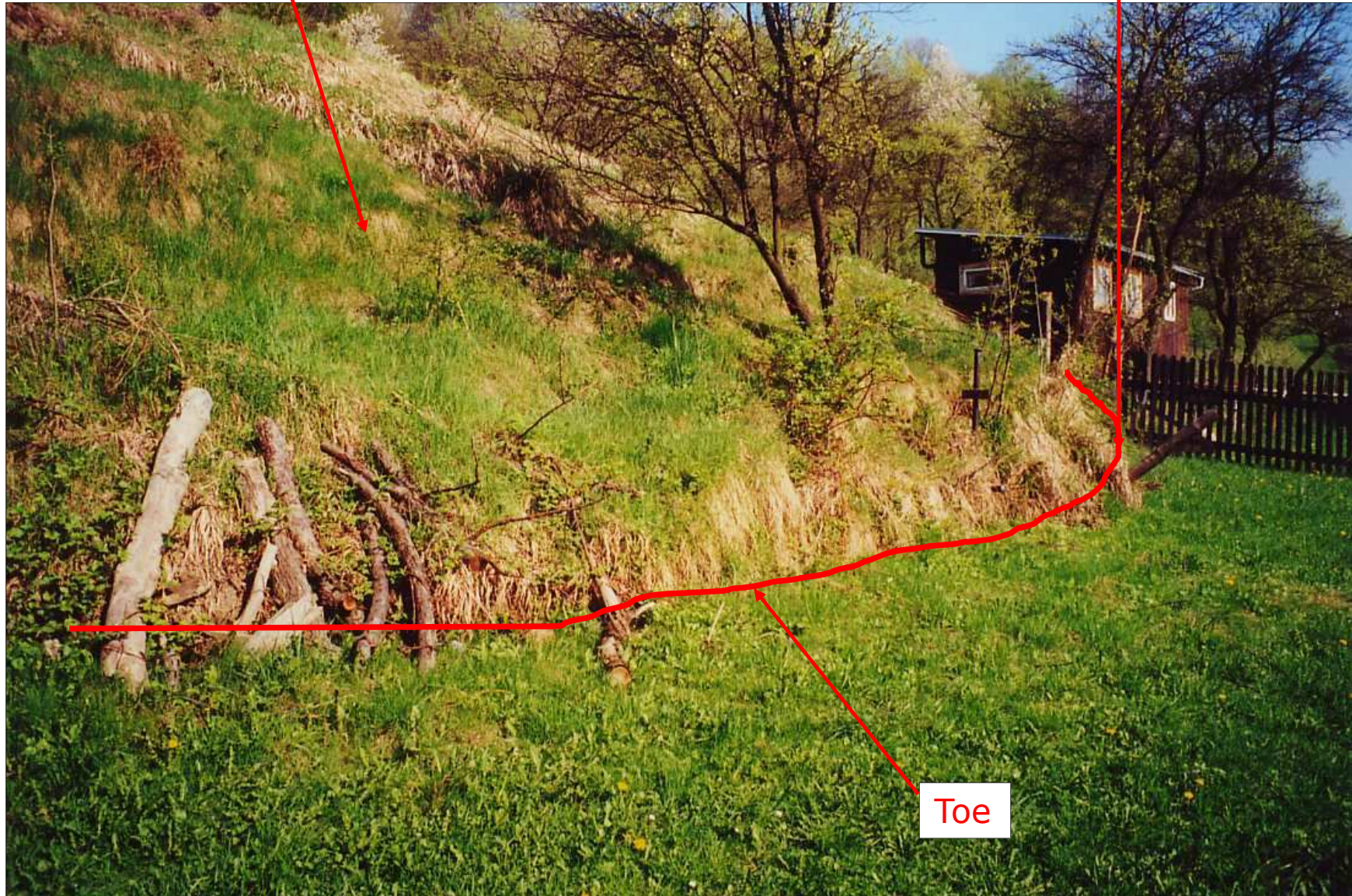
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Foot, accumulation

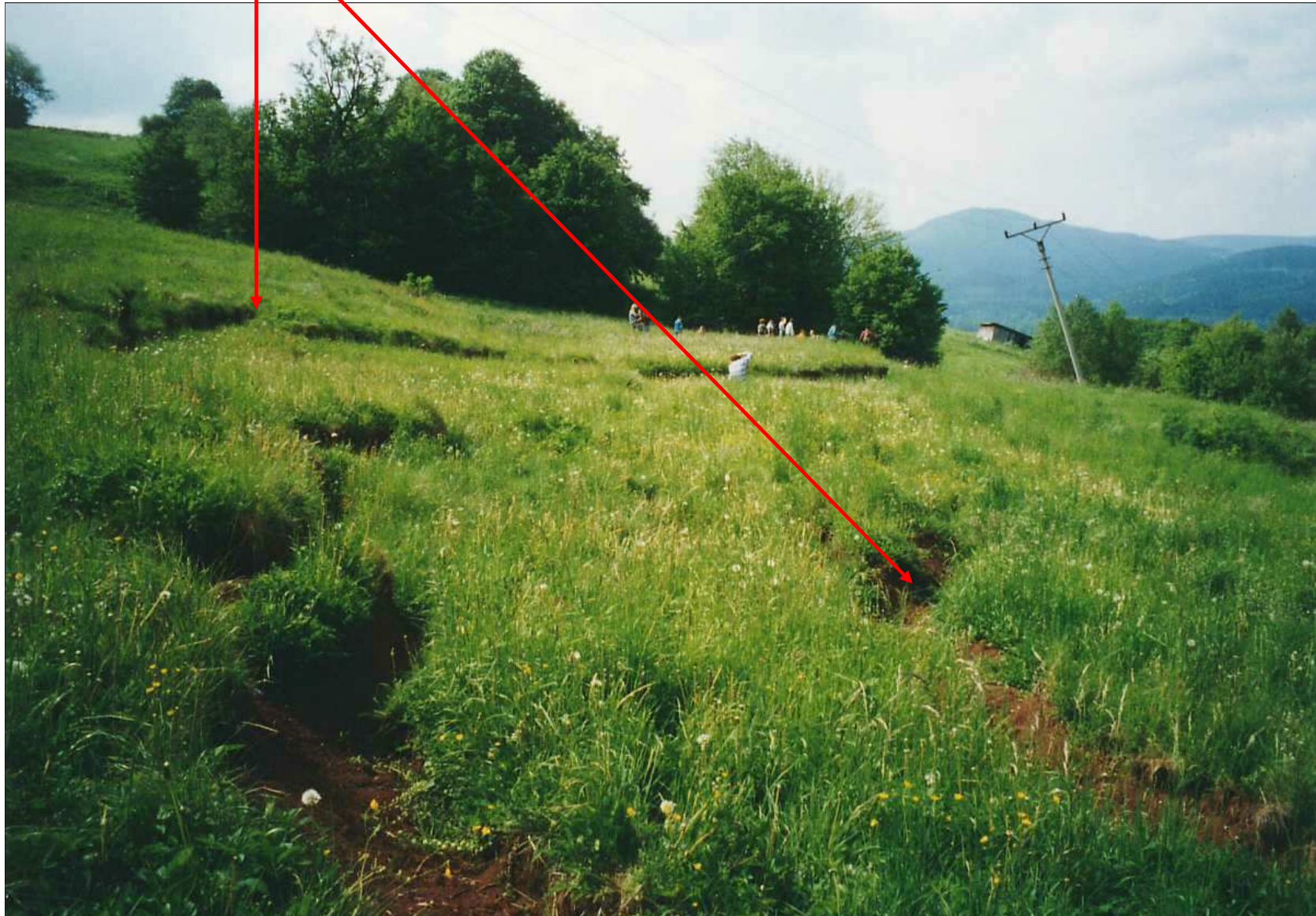
Tip



Toe

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Crown cracks



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Classification of the states of activity of landslides

Active: An active landslide is currently moving. In the example shown erosion at the toe causes a block to topple.

Suspended: A suspended landslide has moved within the last 12 months, but is not active at present. In the example shown local cracking can be seen in the crown of the topple.

Reactivated: A reactivated landslide is an active landslide which has been inactive. In the example shown another block topples and disturbs the previously displaced material.

Inactive: An inactive landslide has not moved within the last 12 months and can be divided into 4 states: Dormant, Abandoned, Stabilized and Relict.

Dormant: A dormant landslide is an inactive landslide which can be reactivated by its original causes or other causes. In the example shown the displaced mass begins to regain its tree cover and scarps are modified by weathering.

Abandoned: An abandoned landslide is an inactive landslide which is no longer affected by its original causes. In the example shown the fluvial deposition has protected the toe of the slope, the scarp begins to regain its tree cover.

Stabilized: A stabilized landslide is an inactive landslide which has been protected from its original causes by remedial measures. In the example shown a retaining wall protects the toe of the slope.

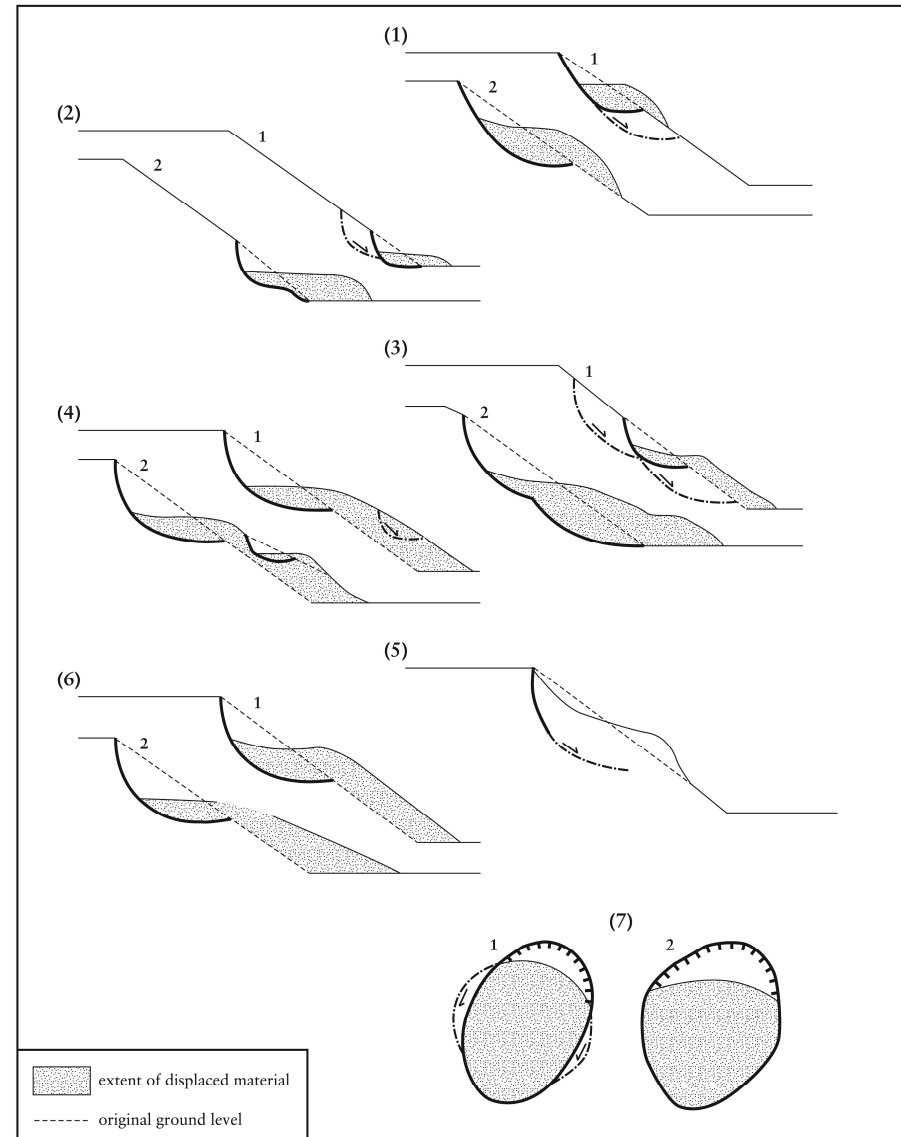
Relict: A relict landslide is an inactive landslide which developed under climatic or geomorphological conditions considerably different from those at present. In the example shown uniform tree cover has been established.

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Distribution of the activity of landslides:

1. **Advancing:** In an advancing landslide the rupture surface is extending in the direction of movement.
2. **Retrogressive:** In a retrogressive landslide the rupture surface is extending in the direction opposite to the movement of the displaced material.
3. **Enlarging:** in an enlarging landslide the rupture surface of the landslide is extending in two or more directions.
4. **Diminishing:** In a diminishing landslide the volume of displaced material is decreasing.
5. **Confined:** In a confined landslide there is a scarp but no rupture surface visible at the foot of the displaced mass.
6. **Moving:** In a moving landslide the displaced material continues to move without any visible change in the rupture surface and the volume of the displaced material.
7. **Widening:** In a widening landslide the rupture surface is extending into one or both flanks of the landslide.

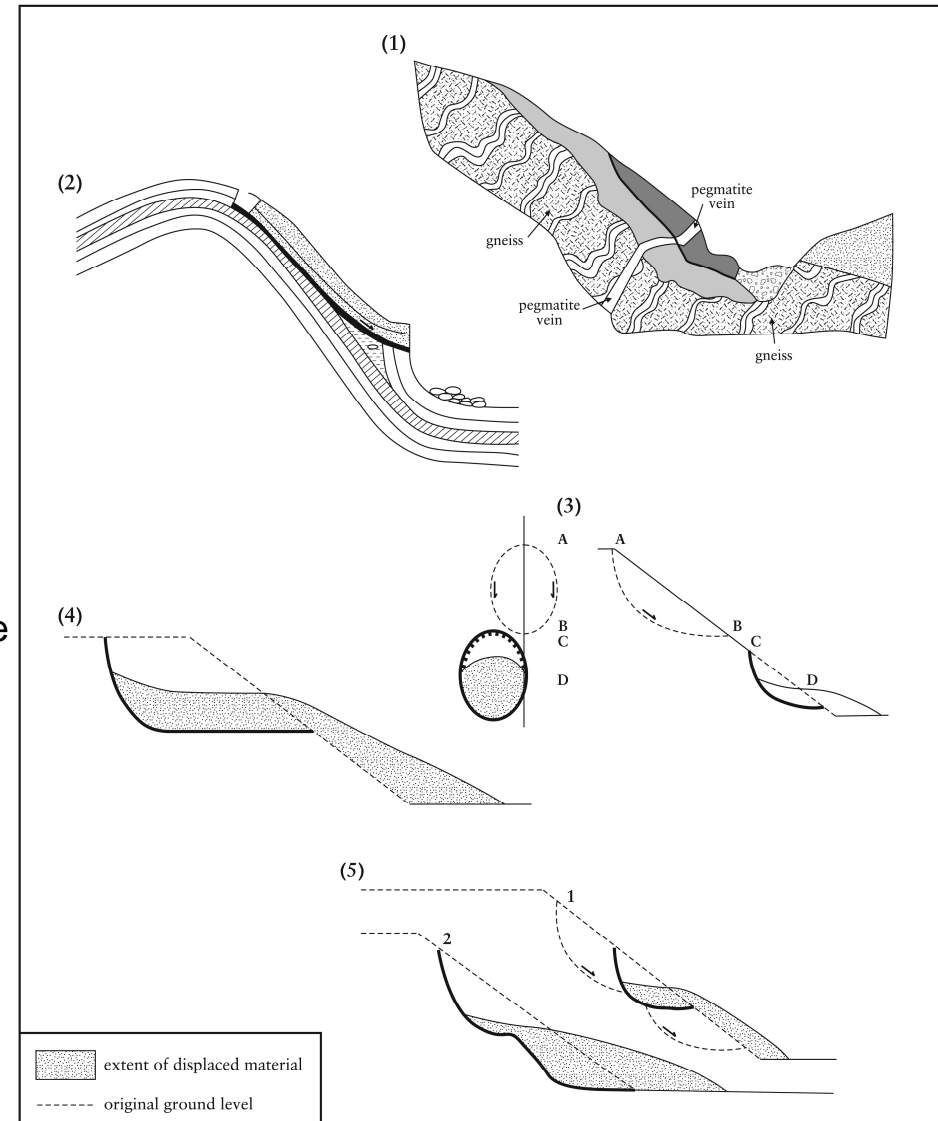


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Styles of landslide activity:

- 1. Complex:** A complex landslide exhibits at least two types of movement (falling, toppling, sliding, spreading and flowing) in sequence. In the example shown a gneiss and a pegmatite vein toppled with valley incision. Alluvial deposits fill the valley bottom. After weathering had weakened the toppled material some of the displaced mass slid further downslope.
- 2. Composite:** A composite landslide exhibits at least two types of movement simultaneously in different parts of the displacing mass. In the example shown the limestones have slid on the underlying shales causing toppling below the toe of the slide rupture surface.
- 3. Successive:** A successive landslide is the same type as a nearby, earlier landslide, but does not share displaced material or rupture surface with it. In the example shown the later slide AB is the same type as CD but does not share displaced material or a rupture surface with it.
- 4. Single:** A single landslide is a single movement of displaced material.
- 5. Multiple:** A multiple landslide shows repeated development of the same type of movement.



LANDSLIDE GLOSSARY

Velocity Classification

The figure below shows the velocity scale proposed by Cruden & Varnes (1996) which rationalises previous scales. The term "creep" has been omitted due to the many definitions and interpretations in the literature.

Velocity Class	Description	Velocity (mm/sec)	Typical Velocity	Probable Destructive Significance
7	Extremely Rapid	5×10^3	5 m/sec	Catastrophe of major violence; buildings destroyed by impact of displaced material; many deaths; escape unlikely
6	Very Rapid	5×10^1	3 m/min	Some lives lost; velocity too great to permit all persons to escape
5	Rapid	5×10^{-1}	1.8 m/hr	Escape evacuation possible; structures, possessions, and equipment destroyed
4	Moderate	5×10^{-3}	13 m/month	Some temporary and insensitive structures can be temporarily maintained
3	Slow	5×10^{-5}	1.6 m/year	Remedial construction can be undertaken during movement; insensitive structures can be maintained with frequent maintenance work if total movement is not large during a particular acceleration phase
2	Very Slow	5×10^{-7}	15 mm/year	Some permanent structures undamaged by movement
	Extremely SLOW			Imperceptible without instruments; construction POSSIBLE WITH PRECAUTIONS

Image Source: Landslide Risk Management Concepts and Guidelines, Australian Geomechanics Society, Sub-Committee on Landslide Risk Management <http://www.australiangeomechanics.org/LRM.pdf>