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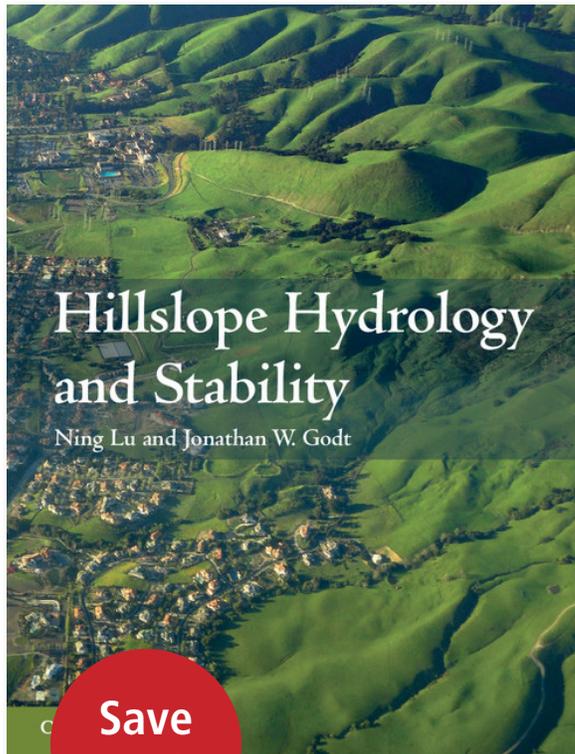
## Hillslope Hydrology and Stability

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### About the Book

Landslides are caused by a failure of the mechanical balance within hillslopes. This balance is governed by two coupled physical processes: hydrological or subsurface flow and stress. The stabilizing strength of hillslope materials depends on effective stress, which is diminished by rainfall. This book presents a cutting-edge quantitative approach to understanding hydro-mechanical processes across variably saturated hillslope environments and to the study and prediction of rainfall-induced landslides. Topics covered include historic synthesis of hillslope geomorphology and hydrology, total and effective stress distributions, critical reviews of shear strength of hillslope materials and different bases for stability analysis. Exercises and homework problems are provided for students to engage with the theory in practice. This is an invaluable resource for graduate students and researchers in hydrology, geomorphology, engineering geology, geotechnical engineering and geomechanics and for professionals in the fields of civil and environmental engineering and natural hazard analysis.



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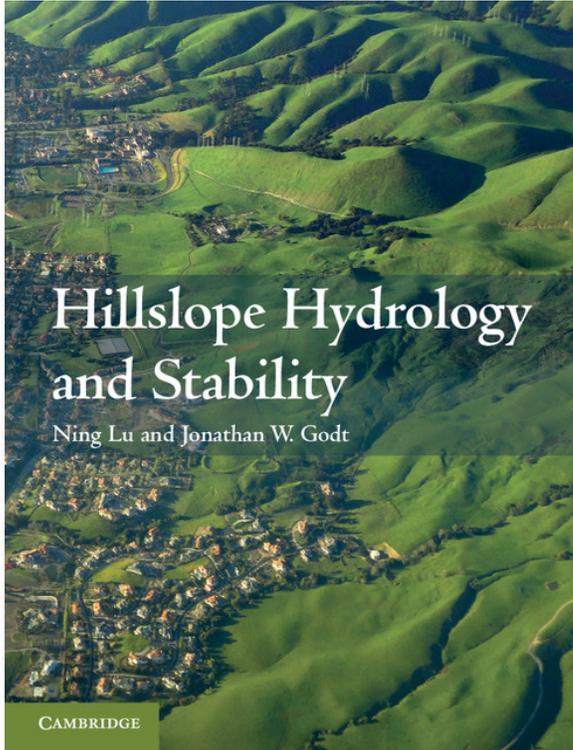
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## Key Features

- Presents theoretical and quantitative approaches to studying stress distribution in hillslopes due to gravity and rainfall infiltration
- Provides the methodology for conceptual, theoretical and quantitative analysis of coupled unsaturated infiltration and effective stress and their roles in hillslope stability

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Foreword by Professor Dani Or

Preface

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2. Hillslope geomorphology

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4. Transient infiltration

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5. Total stress in hillslopes

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### Part IV. Material Properties

7. Strength of hillslope materials

8. Hydro-mechanical properties

### Part V. Hillslope Stability

9. Failure surface-based stability analysis

10. Stress field-based stability analysis

References

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