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THE INFLUENCE OF BEDROCK COMPOSITION AND STRUCTURE  
ON COASTAL SLOPES AND ASSOCIATED TYPES OF FAILURE  
IN NORTHERN CALIFORNIA

A Senior Thesis in Partial Fulfillment of  
the Requirements for the Bachelor of Science  
Degree in Geology

by

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## ABSTRACT

A study was conducted to determine the extent to which bedrock composition and structure influence coastal slopes and associated types of slope failure. The study area consists of steep slopes and sea cliffs undergoing active retreat. The area is comprised of Quaternary marine terrace deposits unconformably overlying Jurassic-Cretaceous Franciscan broken formation. In general, rockfall and rockcreep are types of failure associated with sandy broken formation terranes. Incipient debris flow is a type of failure associated with shaley broken formation terranes and debris flow is associated with argillite zones within shaley broken formation terranes. Results of a fracture density survey show that a trend of slope failure ( rockfall to rockcreep to incipient debris flow to debris flow) is associated with increasing shale percentages and increasing fracture density . Statistical analysis indicates that fracture density and lithology , as regression variables representing bedrock structure and composition, account for 60% of the variance in slope, a dependent regression variable. Results of a joint survey indicate that the coast is structurally controlled by wave erosion proceeding along bedding planes and joints. Joint intersection diagrams indicate that coastal slopes composed of sandstone are geometrically stable and are not prone to major landsliding.

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