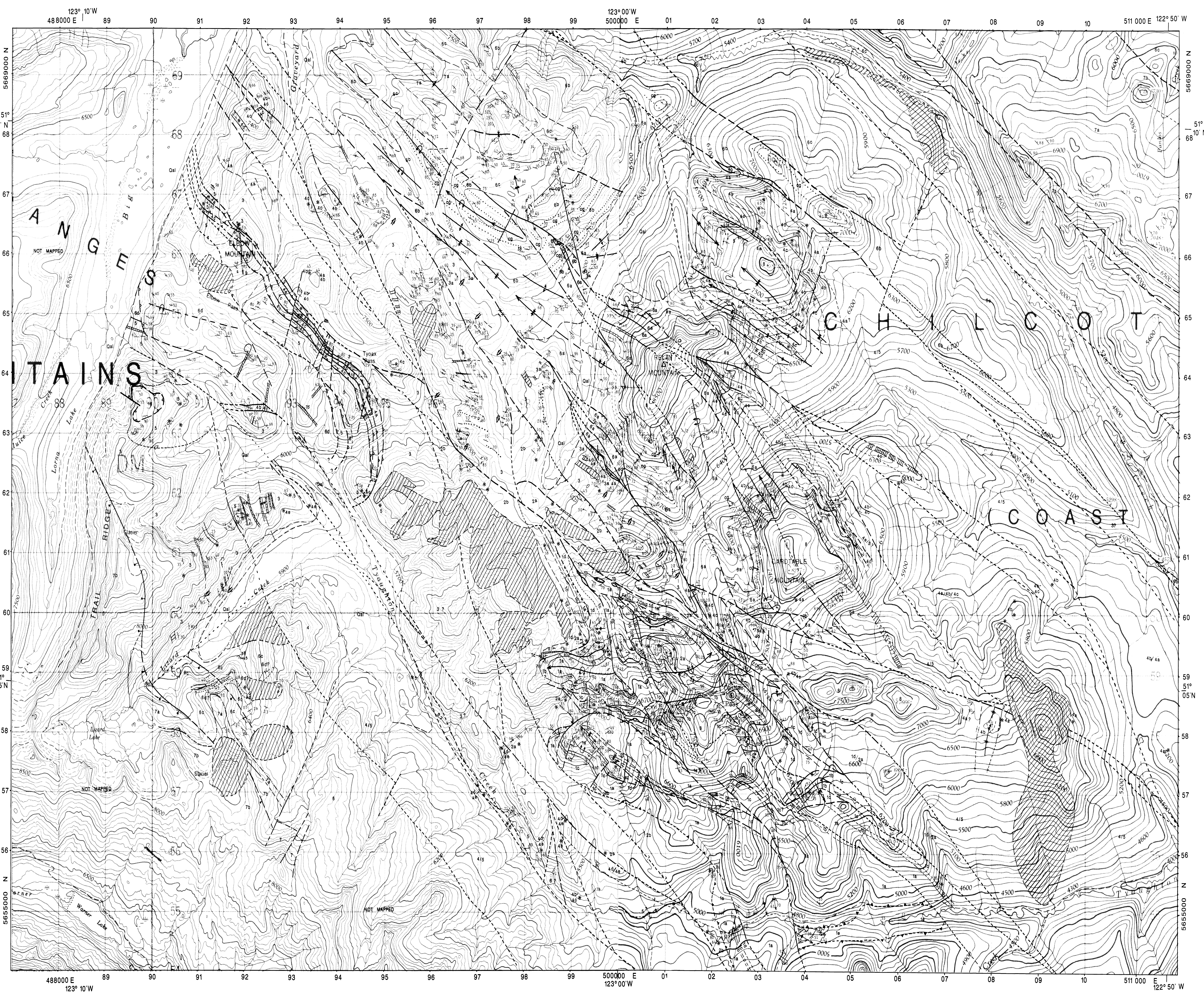


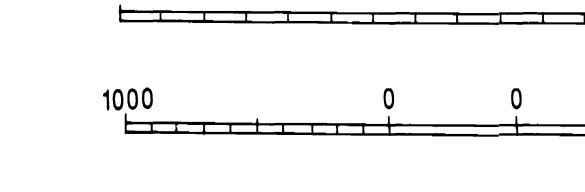
XX. GEOLOGY OF THE RELAY MOUNTAIN AREA  
 NTS E92/D AND W92/D/2

Geology by P. J. Umhoefer, J. J. Garver, (University of Washington A3-30, Seattle WA 98195, USA) and H. W. Tipper, (Geological Survey of Canada, 100 W. Pender St., Vancouver, British Columbia, V6B1R6); 1988  
 Based on detailed mapping 1985, 1986, 1987  
 Includes data from reports and maps by H. W. Tipper, J. A. Jelecky, and E. T. Troer; and by J. K. Glover and P. Schiarizza  
 T. Troer  
 Compilation by P. J. Umhoefer and J. J. Garver

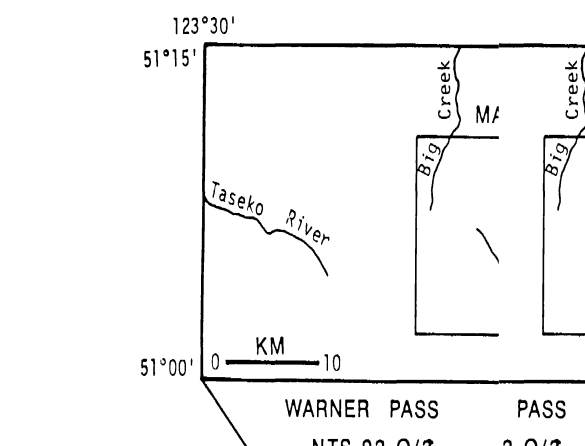


LEGEND

- STRATIFIED ROCKS**
- PLEISTOCENE AND HOLOCENE**
- Qa1 Alluvium, undifferentiated
- MIOCENE AND/OR PLEIOCENE**
- 8 Basaltic lava flow, columnar jointing
- UPPER CRETACEOUS (Cenomanian and ?) younger**
- BATTLEMENT RIDGE GROUP**
- 7b Powell Creek formation  
Volcanic breccia and lapilli tuff with interbedded tuff flow, and epiclastic sandstone; intermediate to basaltic (150m thick/glaucous(?) with Siderwick formation)
  - 7a Siderwick formation (Ahuay/Cenomanian ?)  
Foliate to oolite conglomerate with minor sandstone and red/maroon siltstone, generally poorly sorted, commonly cross bedded; (intermediate); East of Relay Mountain - conglomerate, poorly sorted, graded, matrix and clast-supported, interbedded with shale and mudstone (probably matrix); clast in all areas dominated by chert, volcanic, sedimentary rocks, and minor platinous and metamorphic rocks; volcanic clast dominant near the top of the section (150m thick/steep basal contact)
- LOWER CRETACEOUS (Albian)**
- TAYLOR CREEK GROUP**
- 6d Elbow Pass formation (Cenomanian/Ahuay ?)  
Green-grey sandstone and volcaniclastic conglomerate, typically graded, local channels, interbedded with shale; exclusively volcano-derived sediment; stratigraphic position unknown - may interfinger with the Lizard formation (900-m thick/gradational)
  - 6c Lizard formation (M to U?) Albian  
Shale and minor sandstone, well bedded, thin bedded, graded, brown weathering, quartzitic; rich in massive; rare volcanic conglomerate (50m thick/steeply conformable contact with Dab conglomerate)
  - 6b Dab conglomerate (L to M Albian)  
Chert-pebble conglomerate (sp. distinctive orange-weathering ribs, well sorted, commonly cross bedded, clast dominantly chert and siliceous volcanic; interbedded with chert-rich sandstone and siltstone, interbedded and fossiliferous; minor tuff (100-m thick) (gradational lower contact with Paradise Creek formation)
  - 6a Paradise Creek formation (L Albian)  
Dominantly shale and primary sandstone weathering, thin bedded, local conglomerate (sp. thick bedded, graded and more graded, mainly clay-supported; clast dominantly volcanic with minor platinous and sedimentary (50-m thick/local conglomerate shales matrix and mudstone with Relay Mountain Group unit 5)
- MIDDLE JURASSIC TO LOWER CRETACEOUS (Calleonian to Berensian)**
- 5 (Houtouan to Berensian)  
Dark grey shale to siltstone, less common sandstone and tuffaceous sandstone, medium to thick bedded, trace sandstone to 30m, locally calcareous concretions in shale, dolerites and basaltic dykes (1000 to 1500m thick/gradational with unit 4)
  - 4a (M to U? Valanginian)  
Brown to grey sandstone and siltstone, medium bedded but poorly defined, dolerites and large flows of basaltic dykes (100 to 200m thick/gradational with unit 4)
  - 4d (U? Berensian to M. Valanginian)  
Basaltic tuffaceous, siltstone to sandstone repeats with basaltic pebbles; in west margin interbedded with grey to brown sandstone, in east all coquina, (30 to 50m thick) (gradational with unit 4)
  - 4c (M. Tithonian to U. Berensian)  
(East) grey siltstone to shaly siltstone and minor sandstone, bedding poorly defined, basaltic locally common in concretionary beds; (West) brown sandstone and minor siltstone, medium to thick bedded, accretionary conglomerate in, clast mainly volcanic and platinous, locally common dolerites and basaltic pebbles (30 to 30m thick) (gradational with unit 4)
  - 4b (Kimmeridgian (?) to M. Tithonian)  
Brown sandstone, medium to thick bedded, bedding poorly defined, uncommon cross bedding, minor conglomerate; sandstone, clast volcanic and platinous, locally common dolerites and basaltic pebbles (100 to 200m thick/gradational with unit 4)
  - 4a (U? Oxyrinus to Kimmeridgian)  
Brown to grey sandstone, siltstone, thin to medium bedded, uncommon concretionary bedding, uncommon cross bedding, rare conglomerate with volcanic and platinous clast, locally common dolerites and basaltic pebbles (20 to 30m thick/gradational with unit 3)
  - 3a (Calleonian to U. Oxyrinus)  
Dark brown to black shale and siltstone, locally abundant 1-5m, Fe-rich, siliceous concretions
  - 3 (East) Dark grey shaly, siltstone, interbedded with brown to grey sandstone to siltstone, thin to thick bedded, ripple laminated; also interbedded with tan calcareous sandstone to siltstone, thin to medium bedded, cross and parallel laminated, some bed graded; minor conglomerate, medium to thick bedded, graded, shaly, clast mainly intermediate to fine volcanic, uncommon pebbles, dolerites, and ammonites in an uncommon, mud-shaly brown sandstone facies (at least 200m thick/locally unconformable upper(?) above unit 2)
- LOWER TO MIDDLE JURASSIC (Hemphillian to L. Berensian)**
- 2b (Hemphillian to L. Berensian)  
Dark grey to black shaly, calcareous, tan calcareous concretions to 2m, minor brown to grey sandstone, locally common white to yellow shaly beds, ammonites (less than 200m thick/gradational with unit 2a)
  - 2a (U. Hemphillian to Siamonites)  
Brown sandstone, siltstone, and conglomerate, calcareous, uncommon cross bedding, common ammonites and pebbles (200 to 300m thick) (disconformably above unit 1d)
- UPPER TRIASSIC (Middle(?) to Upper Norian)**
- TYAUGHTON GROUP**
- 1d (Upper Upper Norian)  
Thin sandstone, thin to medium bedded, low angle cross bedding, fine pebbles, conglomerate strings or thin beds, clast all intermediate to fine volcanic, small pebbles, Chonetes ammonites (0 to 75m thick) (gradational with unit 1c)
  - 1c (Middle Upper Norian)  
Laminated conglomerate; limestone clast bed to 1m to 1.5m, grades from clast supported to matrix supported (matrix angular coarse to grit quartz sandstone, locally red to yellow, cross bedded) (0 to 2m thick) (disconformably above unit 1b); grades to sandstone, thin to medium bedded, interbedded with brown conglomerate, clast mainly volcanic and limestone, matrix fossil only at transition to above unit (0 to 10m thick/gradational between L. Comp. and Cassinella beds, below L. comp. missing, then disconformably above unit 1b); Cassinella beds, brown sandstone to siltstone, interbedded with ribs (0.5m) of fossiliferous calcareous sandstone, laminated, Cassinella, Murchisonia, and other pebbles; Rhynchonella ammonites (0 to 120m thick) (gradational with green cross bedded sandstone)
  - 1b (Lower Upper Norian)  
Thin limestone, thin to medium bedded (plaster to waxy), Stromatolites pebbles, cross, brown, locally common black chert concretions (2 to 5m thick) (disconformably overlies unit 1a); Matrix limestone; tan to grey, thin bedded, Menes pebbles (0 to 15m thick) (gradational with grey limestone)
  - 1a (Middle (?) Norian)  
Red beds, conglomerate and conglomerate sandstone, massive to thick bedded, clast mainly intermediate to fine volcanic and limestone, siltstone, phyllonite, interbedded with red to brown sandstone, thin to medium bedded, cross bedded, graded, limestone clast dated Early Norian conditions (>30m thick) (bank not exposed)
- INTRUSIVE ROCKS**
- UPPER CRETACEOUS TO EOCENE**
- Hornblende plagioclase porphyries; hornblende plagioclase biotite porphyries with accessory quartz (rocks and dikes)



SCALE



NTS 92 01/8 2 01/8

