Geology 202
Outline for Term Paper

I. Introduction
   A. Settlement of area over recorded history, perception of abundant water
   B. Knowledge of water supply limits relatively recently learned
   C. General climate of area
      1. semi-arid, rainfall between 6 and 14 inches / year
      2. most of water resources in underground aquifers

II. Geologic Overview
   A. Tectonic setting
      1. Upper Klamath Basin
         a. transition area between Cascades and “Basin and Range” provinces
         b. Mountains to West “squeeze” rain out
         c. Faultlines trend north-south
      2. Lower Klamath Basin
         a. bounded by Franciscan formation on all sides
         b. located within Yurok Indian reservation
      3. Lost River sub-basin
         a. located within “Basin and Range” province
         b. Faults trend north-south
   B. Geologic history
      1. Miocene era (7 to 8 Million yrs.)
         a. Bryant Mountain eruption of calc-alkaline basaltic tachyandesites
         b. Faulting in basin & range
         c. erosion processes creating low hills & broad valleys
      2. Pliocene era (4 to 5 Million yrs.)
         a. vent eruptions producing more calc-alkaline basaltic tachyandesites of different chemistry over time
         b. sediments carried through valleys loaded with basaltic tuff and cinders.
      3. Pleistocene era
         a. Lake Modoc inundated all current valleys (4,240 asl max.)
         b. Lacustrine mudstone deposition in lakebed
         c. Miller Creek formed gravel delta where it flowed into lake
         d. other rivers in area formed alluvial fans on entry into lake
      4. Present day
         a. recession of Lake Modoc left current water bodies
            1. Upper Klamath Lake
            2. Tule Lake
            3. Alkali Lake
            4. Swan Lake
            5. Lost River

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b. subsequent deposition
   1. playa deposits
   2. windblown sand
   3. colluvium
   4. stream alluvium
   5. landslide deposits

c. hot springs
   1. centered around Klamath Falls and Klamath Hills
   2. temp between 140 and 235 degrees
   3. water source is deep and unknown

III. Water Resources
A. geology of water supply
   1. earliest volcanic rocks have greatest aquifer potential
   2. later layers of sediments
      a. some serve as aquicludes
      b. some are only poor aquifers rather than aquicludes
   3. hot springs
      a. capped by aquicludes, cracks allow venting
      b. water for steam vents not dependent on rainfall

B. human occupation
   1. residential
      a. greatest water usage
      b. increased heavily since 1950, growth nearly exponential
   2. Farmers
      a. planting – slowly increasing usage of water since 1950
      b. livestock – mostly flat usage of water over last 50 years
   3. Yurok Indian reservation
      a. integrity of fish population in waterways is primary concern
      b. other uses of water mostly flat growth curve

C. management of resources
   1. Oregon side
   2. California side
   3. current management policy
      a. successes – disaster averted or at least delayed
      b. failures – notably in area of public relations

IV. Summary and Conclusion
A. most intelligent usage of currently known resources
B. potential future of area
   1. if new source of water is somehow discovered and tapped
   2. if no new source of water is found

V. References
A. Koch, J. G., 1963, Late Mesozoic Orogenesis and Sedimentation, Klamath Province, Southwest Oregon Coast, University Microfilms International

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