1981

Geologic Map and Coal Sections of the Red Point Quadrangle

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U.S. Forest Service
U.S. Geological Survey
Joseph R. Frank

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Methods

In a study of the ecology of the Arctoalpine zone, the authors describe the distribution and abundance of plant species along an altitudinal gradient. The study area is located in the Rocky Mountains of Colorado, where the altitudinal range of the Arctoalpine zone extends from 3,000 to 4,000 meters above sea level.

The plant communities were described in 10 elevation bands, each representing a 100-meter increment in altitude. The species composition and abundance were determined through field observations and herbarium collections.

The results showed a significant decrease in species richness and abundance with increasing altitude. The highest diversity and abundance were found in the lower elevation bands, while the upper bands had fewer species and lower abundance. This pattern is typical of alpine ecosystems, where species diversity decreases with increasing altitude due to the harsher environmental conditions.

The study also highlighted the importance of considering the elevational gradient in the management and conservation of alpine ecosystems. The findings have implications for the design of protected areas and the implementation of conservation strategies in the Rocky Mountains and other similar mountain ranges.
### Stratigraphic Sequence

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>SERIES</th>
<th>FORMATION</th>
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<tbody>
<tr>
<td><strong>QUATERNARY</strong></td>
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<td><strong>TERTIARY</strong></td>
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</table>

**Key**
- **Qul**: Alluvium
- **Qpl**: Pediment deposits
- **Qia**: Landslip deposits
- **Qc**: Colluvium
- **TXal**: North Bore Formation
- **Qpr**: Pritis River Formation
- **Qco**: Castelegga Sandstone
- **Ee**: Blackhead Formation

**CONTACT**—Snub where approximately located; dotted line indicates contact.

**FAULT**—Snub where approximately located, dotted line indicates fault.

**ANOMALIES**—Snub where approximately located, dotted line indicates anomaly.

**CHAL SEXTION**—Snub number refers to measured sections along section.
**Stratigraphic Sequence of Exposed Rocks**

- **Quaternary**
  - Holocene and Pleistocene

- **Tertiary**
  - Paleocene

- **Cretaceous**
  - Upper Cretaceous

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**List of Map Units**

- **Quaternary**
  - Alluvion
  - Pediment deposits
  - LANDSLIDE DEPOSITS
  - Colluvion
  - North Horn Formation
  - Price River Formation
  - Castlegate Sandstone
  - BLACKHAWK FORMATION

- **Tertiary**
  - Alluvion
  - Pediment deposits
  - UPPER PALEOCEAN
  - Lower part of Blue Gate Shale Member
  - Middle part of Emery Sandstone Member
  - Lower part of Emery Sandstone Member
  - Blackhawk Formation

- **Cretaceous**
  - Star Point Sandstone

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**Contact** - Dashed where approximately located; dotted where concealed.

**Fault** - Dashed where approximately located; dotted where concealed.

**Anticline** - Dashed where approximately located; dotted where concealed.

**Coal Section** - Circled number refers to measured coal section. Line points to top of coal section.

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**Stratigraphic Sequence of Exposed Rocks**

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>SERIES</th>
<th>FORMATION</th>
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</thead>
<tbody>
<tr>
<td><strong>Quaternary</strong></td>
<td>Holocene and Pleistocene</td>
<td>Surface deposits</td>
</tr>
<tr>
<td><strong>Tertiary</strong></td>
<td>Paleocene</td>
<td>North Horn Formation</td>
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<tr>
<td><strong>Cretaceous</strong></td>
<td>Upper Cretaceous</td>
<td>Star Point Sandstone</td>
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</tbody>
</table>

**Description**

- **Alluvion** (Quaternary) - Unconsolidated and stratified unconsolidated to coarse-grained, clay, silt, sand, and gravel. Includes some alluviation and alluvial fan deposits, particularly in lower-valley areas.

- **Landslide Deposits** (Tertiary) - Unconsolidated and stratified deposits derived from older surficial deposits and bedrock blocks derived mostly from North Horn Formation.

- **Colluvion** (Quaternary) - Recent sorted and stratified alluvial deposits derived from older surficial deposits and bedrock blocks derived mostly from North Horn Formation.

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**STRATIGRAPHIC SEQUENCE OF EXPOSED ROCKS**

**NOT TO SCALE**

- **Holocene** (Quaternary) - Shales, gray, grayish-purple, and red-purple, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

- **North Horn Formation** (Tertiary) - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

- **Price River Formation** (Tertiary) - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

- **Castlegate Sandstone** (Tertiary) - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

- **Blackhawk Formation** (Cretaceous) - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

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**North Horn Formation** - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

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**Price River Formation** - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

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**Castlegate Sandstone** - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

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**Blackhawk Formation** - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

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**Star Point Sandstone** - Black shale, gray, and red-gray, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.

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**Maroon Shale** - Shales, dark-to-light-gray, silt, and clay, with occasional light colors, slightly to highly gravelly, sand, and gravelly, with occasional light colors. Contains interbedded light-gray, fine-grained sandstone and gravel, and occasional siltstone and sandstone.
GEOLOGIC MAP AND COAL SECTIONS OF THE RED POINT QUADRANGLE, EMERY COUNTY

By

Eugene G. Ellis and Joseph R. Frank

1981
### Stratigraphic Sequence of Exposed Rocks

#### Not to Scale

<table>
<thead>
<tr>
<th>System</th>
<th>Series</th>
<th>Formation</th>
<th>Description</th>
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<tbody>
<tr>
<td>Cretaceous</td>
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<td>Star Point Sandstone</td>
<td>Light-gray very fine sandstone to fine-grained massive to planar laminated; white to very light gray 'gyp' locally present; light-gray algalITE; light-gray shale; cliff-forming; 63-245 m thick</td>
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<td>Mancos Shale</td>
<td>Dark-gray to light-gray, silty, gray algalITE; and yellow, brown, and gray, very fine grained to medium-grained sandstone; Upper part 500 m present in quadrangle. Total thickness about 2,065 m at Outcrops Creek 50 km to the south (October, 1939)</td>
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<td>Blackhawk Formation</td>
<td>Sandstone, gray-orange to light-gray fine to medium-grained medium to large-crossbedded; moderate-weathered sandstone to medium-gray shale; light-gray to moderate-light-gray shale; cliff-forming. Top conformable with Star Point Sandstone; palaeochannels into upper Star Point Sandstone locally present; 370-145 m thick</td>
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<td>Casper Sandstone</td>
<td>Light-gray to medium-gray, silty, very fine sandstone to fine-grained sandstone; cliff-forming; 80-100 m thick</td>
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#### Description

**Alluvium (Qa)—** Very moderately sorted and stratified deposits on floodplains, adjacent to valleys, sloughs, and gently sloping streams; locally covered by recent alluvium, particularly in broad valleys.

**Floodplain Deposits (Qp)—** Poorly sorted and stratified deposits of recent age, occurring in small slackwater basins. Deposition is related to local gradients and post-Cretaceous lowering of base level.

**Landslide Deposits (Qol)—** Poorly sorted deposits derived from older surficial deposits and rock blocks derived mainly from older surficial formation.

**Colluvium (Qc)—** Poorly sorted and stratified angular to subangular clasts of alluvial, colluvial, and volcanic material, scattered within the surficial deposits.

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**COUNTY, UTAH**
EXPLANATION

- Coal, thickness in meters
- Many coal, thickness in meters
- shale, thickness in meters
- Art. Ash, thickness in meters
- Burnt rock
- Coal, Coal, thickness in meters
- Carbonaceous shale
- Shale
- Sandstone
- Shale

Notes:
- Coal, thickness combined where interbedded
- Consecutive interval
- Seismic interval
- Coal section noted on Map
- Coal, coal section this report
- Coal, coal section modified after Spider (1931)

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MEASURED COAL SECTIONS

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MEASURED COAL SECTIONS

GEOLOGIC MAP AND COAL SECTIONS OF THE RED POINT QUADRANGLE, EM

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P AND COAL SECTIONS OF THE RED POINT QUADRANGLE, EMERY COUNTY, UTAH

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1981
MEASURED COAL SECTIONS

GEOLOGIC MAP AND COAL SECTIONS OF THE RED POINT QUADRANGLE, E1

By

Eugene G. Ellis and Joseph R. Frank

1981