

GEOLOGICAL AND HYDROCHEMICAL SENSITIVITY

Hendrey et al. (1980), United States Geological Survey

Objective

To identify bedrock sensitivities in order to predict sensitivities of surface waters.

Criteria

Rock formations are classified according to their potential buffering capacity based on chemical composition.

Sensitivity Class Definitions

Rock Classification as follows:

- Type I - Low to no buffering capacity
Granite/Syenite or metamorphic equivalent
Granitic gneisses
Quartz sandstones or metamorphic equivalent
- Type II - Medium/Low buffering capacity
Sandstones, shales, conglomerates or their metamorphic equivalent (no free carbonate phases present).
High grade metamorphic felsic to intermediate volcanic rocks.
Intermediate igneous rocks.
Calc-silicate gneisses with no free carbonate phases.
- Type III - Medium/High buffering capacity
Slightly calcareous rocks
Low grade intermediate to mafic volcanic rocks
Ultramafic rocks
Glassy volcanic rocks.
- Type IV - "Infinite" buffering capacity
Highly fossiliferous sediments or metamorphic equivalents.
Limestones or dolostones.

Map Product

Sensitivity maps at 1:250,000 or 1:500,000 produced from state geology base maps at 1:24,000 or 1:62,500 for all eastern States.

Interpretation

- Type I - Widespread impact from acidic precipitation expected.
- Type II - Impact from acidic precipitation restricted to first and second order streams and small lakes. Complete loss of alkalinity unlikely in large lakes.

Type I and II rocks can be identified with surface waters having an alkalinity less than 200 $\mu\text{eq/l}$.