

PRELIMINARY EVALUATION OF WATER QUALITY STATUS IN THE RARITAN RIVER BASIN, WATER YEARS 1991-97

**17 constituents from 21 sites were used to
characterize water quality in the basin**

--Major Ions, Nutrients, Suspended Sediment, pH,
water temperature, fecal coliform

Constituents summarized from previous studies

--Pesticides

--Volatile Organic Compounds

--Trace Elements in bedsediment

Analysis of Water Quality Constituents

Water Quality Standards

Trends

Seasonal Differences

Hydrologic Differences

Geographic Differences

Relation to Total Suspended Solids

WATER QUALITY STANDARDS

13 of 17 constituents studied have standards

9 of 13 did not meet standards at ≥ 1 site

Each site had ≥ 1 violation

Violations of standards:

Phosphorus 32%

Fecal Coliform 29%

Hardness 21%

pH 17%

Water Temperature at trout sites 12%

Pesticides Infrequently Exceed Standards

Atrazine and Alachlor: NJ drinking water standards

Chlorpyrifos, DDE, Dieldrin: NJ surface water
standard

Cyanazine: EPA Human Health Advisory Level

Chlorthalonil: Canadian criteria for aquatic life

Diazinon: Great Lakes Aquatic Life standard

Ethyl Parathion: EPA Aquatic Life standard

VOC's

No exceedances of criteria

Water Quality vs Streamflow

Constituents increasing with streamflow:

BOD

Dissolved Oxygen

Total Organic Carbon

Total Suspended Solids

Constituents decreasing with streamflow:

Alkalinity

Ammonia, Un-ionized

Total Dissolved solids

Fecal Coliform

Hardness

pH

Water Temperature

Constituents vary by site, some sites increase & some decrease with streamflow:

Ammonia plus organic nitrogen

Chloride

Nitrate plus nitrite

Total phosphorus

Sodium

Sulfate

WATER QUALITY BY SEASON

Constituents higher in growing season:

Alkalinity
Ammonia plus organic nitrogen
Ammonia, Un-ionized
BOD
Fecal Coliform
Hardness
Total Organic Carbon
pH
Total Phosphorus
Water Temperature

Constituents higher in nongrowing season:

Chloride
Dissolved Oxygen
Total Dissolved Solids
Nitrate plus Nitrite
Sodium

Constituents vary by site:

Sulfate
Total suspended Solids

TRENDS IN DATA

Decreasing over time

Ammonia plus organic nitrogen

Fecal coliform

Total organic carbon

Total Phosphorus

Water Temperature

Increasing over time

Alkalinity

Chloride

Total Dissolved Solids

Hardness

Nitrate plus Nitrite

pH

Sodium

Constituents varying by site:

BOD

No Observed Trends:

Total Suspended Solids

Most Violations/ Highest Levels

Millstone River: TKN, BOD, P, Temp, DO, Na,
TOC, NO₂+NO₃

Neshanic River: Ammonia, TSS, Hardness, Na, So₄,
TDS, Coliform

Raritan River mainstem: TKN, Coliform, P, TSS,
Temperature, TOC

Stony Brook: TSS, Hardness, Na, TOC

Matchaponix Brook: DO, Na, SO₄, NO₂+NO₃, TDS

S.B. Raritan at 3 Bridges: BOD, Temperature, TDS

Lamington River: TOC, Cl

N.B. Raritan at Burnt Mills: Ammonia

S.B. Raritan at Stanton: Ammonia

N.B. Raritan River at Chester: Cl

Lowest Levels/ Least Violations

Mulhockaway Creek: TKN, NO₂+NO₃, BOD, TDS, Hardness, TOC, P, TSS

Lamington River: Coliform, DO, NO₂+NO₃, SO₄, Temperature

Spruce Run: TKN, Hardness, TOC, P

N.B. Raritan River near Chester: TSS, temperature, ammonia, BOD

Manalapan Brook: BOD, coliform, TDS, Na

Millstone River at Manalapan: BOD, TDS, Na

S.B. Raritan River at Middle Valley: Sul;fate, Ammonia,

Matchaponix Brook: Coliform, BOD

Neshanic River: DO