

Figures

Aquatic Survey of NASA Goddard Space Flight Center

Main and East Campuses

2002

By

R. Christian Jones
Professor and Chair
Department of Environmental Science and Policy
George Mason University
Fairfax, VA 22030

Submitted
December 5, 2003

List of Figures

Figure 1. Area Map

Figure 2. Map showing location of Stream and Pond sampling sites.

Figure 3. Stream Temperature by Sampling Date

Figure 4. Stream Temperature by Station.

Figure 5. Stream Specific Conductance by Sampling Date

Figure 6. Stream Specific Conductance by Station.

Figure 7. Stream Dissolved Oxygen (mg/L) by Sampling Date

Figure 8. Stream Dissolved Oxygen (mg/L) by Station.

Figure 9. Stream Dissolved Oxygen (% saturation) by Sampling Date.

Figure 10. Stream Dissolved Oxygen (% saturation) by Station.

Figure 11. Stream pH by Sampling Date

Figure 12. Stream pH by Station.

Figure 13. Stream Ammonia-Nitrogen (mg/L) by Sampling Date.

Figure 14. Stream Ammonia-Nitrogen (mg/L) by Station.

Figure 15. Stream Nitrate-Nitrogen (mg/L) by Sampling Date.

Figure 16. Stream Nitrate-Nitrogen (mg/L) by Station.

Figure 17. Stream Soluble Reactive Phosphorus (ug/L) by Sampling Date.

Figure 18. Stream Soluble Reactive Phosphorus (ug/L) by Station.

Figure 19. Stream Total Phosphorus (ug/L) by Sampling Date.

Figure 20. Stream Total Phosphorus (ug/L) by Station.

Figure 21. Stream Total Suspended Solids (mg/L) by Sampling Date.

Figure 22. Stream Total Suspended Solids (mg/L) by Station.

Figure 23. Stream Volatile Suspended Solids (mg/L) by Sampling Date.

Figure 24. Stream Volatile Suspended Solids (mg/L) by Station.

Figure 25. Stream Hach Turbidity by Sampling Date.

Figure 26. Stream Hach Turbidity by Station.

Figure 27. Average Pond Temperature (oC) by Sampling Date.

Figure 28. Average Pond Specific Conductance (uS/cm) by Sampling Date.

Figure 29. Average Pond Dissolved Oxygen (mg/L) by Sampling Date.

Figure 30. Average Pond Dissolved Oxygen (% saturation) by Sampling Date.

Figure 31. Average Pond pH by Sampling Date.

Figure 32. Average Pond Secchi Depth (m) by Sampling Date.

Figure 33. Average Pond Light Attenuation Coefficient (m-1) by Sampling Date.

Figure 34. Average Pond Hach Turbidity by Sampling Date.

Figure 35. Average Ammonia Nitrogen (mg/L) by Sampling Date.

Figure 36. Average Nitrate Nitrogen (mg/L) by Sampling Date.

Figure 37. Average Soluble Reactive Phosphorus (ug/L) by Sampling Date.

Figure 38. Average Total Phosphorus (ug/L) by Sampling Date.

Figure 39. Average Total Suspended Solids (mg/L) by Sampling Date.

Figure 40. Average Volatile Suspended Solids (mg/L) by Sampling Date.

Figure 41. Temperature (oC) Vertical Profile in Pond P by Sampling Date.

Figure 42. Temperature (oC) Vertical Profile in Pond R by Sampling Date.

Figure 43. Specific Conductance (uS/cm) Vertical Profile in Pond P by Sampling Date.

Figure 44. Specific Conductance (uS/cm) Vertical Profile in Pond R by Sampling Date.

Figure 45. Dissolved Oxygen (mg/L) Vertical Profile in Pond P by Sampling Date.

Figure 46. Dissolved Oxygen (mg/L) Vertical Profile in Pond R by Sampling Date.

Figure 47. Dissolved Oxygen (percent saturation) Vertical Profile in Pond P by Sampling Date.

Figure 48. Dissolved Oxygen (percent saturation) Vertical Profile in Pond R by Sampling Date.

Figure 49. pH Vertical Profile in Pond P by Sampling Date.

Figure 50. pH Vertical Profile in Pond R by Sampling Date.

Figure 51. Ammonia Nitrogen (mg/L) Vertical Profile in Pond P by Sampling Date.

Figure 52. Ammonia Nitrogen (mg/L) Vertical Profile in Pond R by Sampling Date.

Figure 53. Nitrate Nitrogen (mg/L) Vertical Profile in Pond P by Sampling Date.

Figure 54. Nitrate Nitrogen (mg/L) Vertical Profile in Pond R by Sampling Date.

Figure 55. Soluble Reactive Phosphorus (ug/L) Vertical Profile in Pond P by Sampling Date.

Figure 56. Soluble Reactive Phosphorus (ug/L) Vertical Profile in Pond R by Sampling Date.

Figure 57. Total Phosphorus (ug/L) Vertical Profile in Pond P by Sampling Date.

Figure 58. Total Phosphorus (ug/L) Vertical Profile in Pond R by Sampling Date.

Figure 59. Total Suspended Solids (mg/L) Vertical Profile in Pond P by Sampling Date.

Figure 60. Total Suspended Solids (mg/L) Vertical Profile in Pond R by Sampling Date.

Figure 61. Volatile Suspended Solids (mg/L) Vertical Profile in Pond P by Sampling Date.

Figure 62. Volatile Suspended Solids (mg/L) Vertical Profile in Pond R by Sampling Date.

Figure 63. Average Chlorophyll (ug/L) by Sampling Date.

Figure 64. Average Pheopigment (ug/L) by Sampling Date.

Figure 65. Chlorophyll (ug/L) Vertical Profile in Pond P by Sampling Date.

Figure 66. Chlorophyll (ug/L) Vertical Profile in Pond R by Sampling Date.

Figure 67. Pheopigment (ug/L) Vertical Profile in Pond P by Sampling Date.

Figure 68. Pheopigment (ug/L) Vertical Profile in Pond R by Sampling Date.

Figure 69. Total Phytoplankton Density (#/mL) Near Surface Values by Sampling Date.

Figure 70. Phytoplankton Density (#/mL) Near Surface Values in Pond P by Major Group on Each Sampling Date.

Figure 71. Phytoplankton Density (#/mL) Near Surface Values in Pond Q by Major Group on Each Sampling Date.

Figure 72. Phytoplankton Density (#/mL) Near Surface Values in Pond R by Major Group on Each Sampling Date.

Figure 73. Total Phytoplankton Biovolume (um³/mL) Near Surface Values by Sampling Date.

Figure 74. Phytoplankton Biovolume (um³/mL) Near Surface Values in Pond P by Major Group on Each Sampling Date.

Figure 75. Phytoplankton Biovolume (um³/mL) Near Surface Values in Pond Q by Major Group on Each Sampling Date.

Figure 76. Phytoplankton Biovolume (um³/mL) Near Surface Values in Pond R by Major Group on Each Sampling Date.

Figure 77. Total Rotifers (#/L) Depth-integrated Values by Sampling Date.

Figure 78. Rotifers (#/L). Depth-integrated Values by Genus in Pond P on Each Sampling Date.

Figure 79. Rotifers (#/L). Depth-integrated Values by Genus in Pond Q on Each Sampling Date.

Figure 80. Rotifers (#/L). Depth-integrated Values by Genus in Pond R on Each Sampling Date.

Figure 81. Bosmina (#/L). Depth-integrated Values by Sampling Date.

Figure 82. Nauplii (#/L). Depth-integrated Values by Sampling Date.

Figure 83. Macrozooplankton (#/m³). Depth-integrated Values in Pond P by Genus on Each Sampling Date.

Figure 84. Macrozooplankton (#/m3). Surface Values in Pond R by Genus on Each Sampling Date.

Goddard Space Flight Center and Vicinity

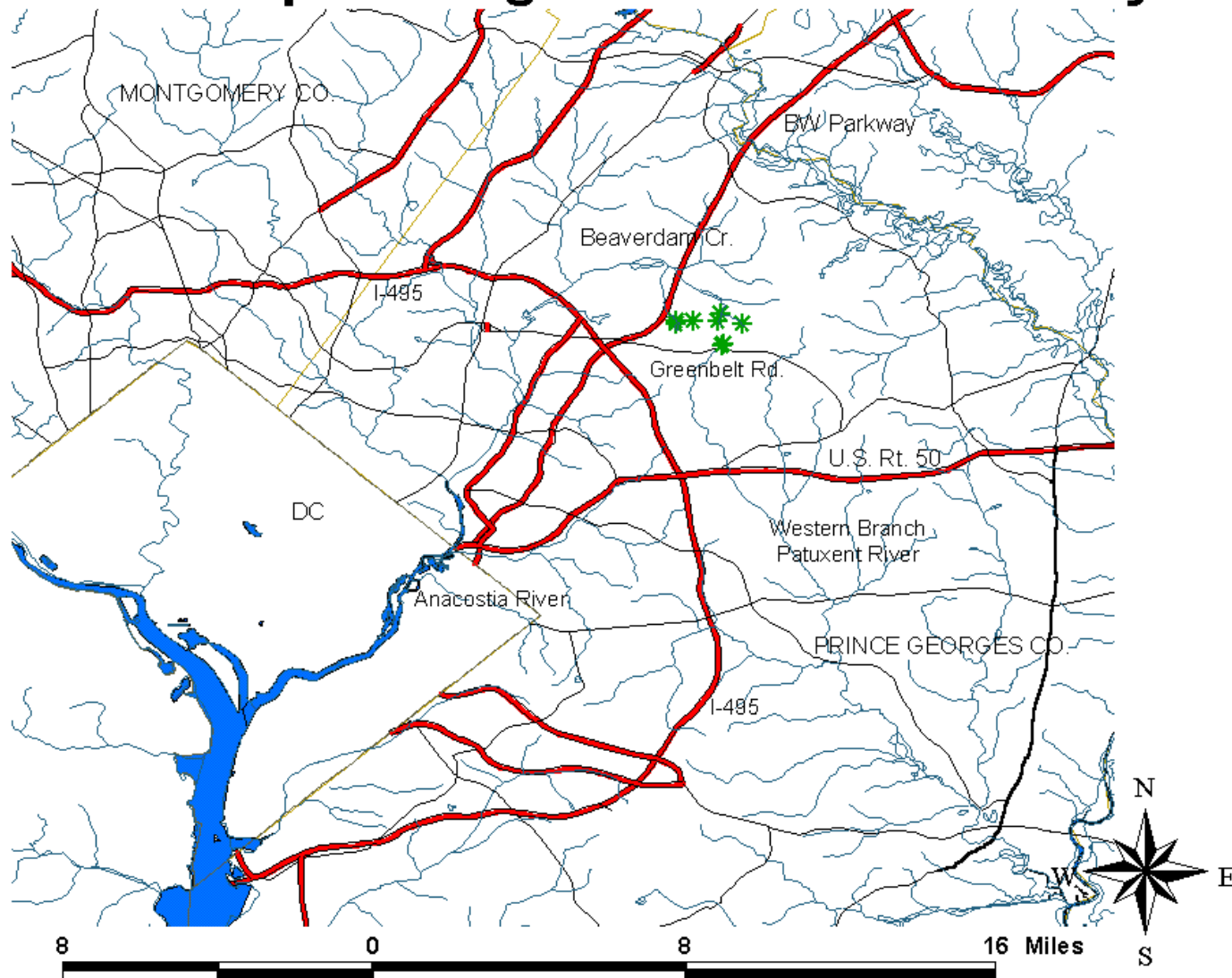


Figure 1. Goddard Space Flight Center (green stars) in relation to the District of Columbia and Maryland suburbs.

Goddard Space Flight Center with Aquatic Sampling Stations

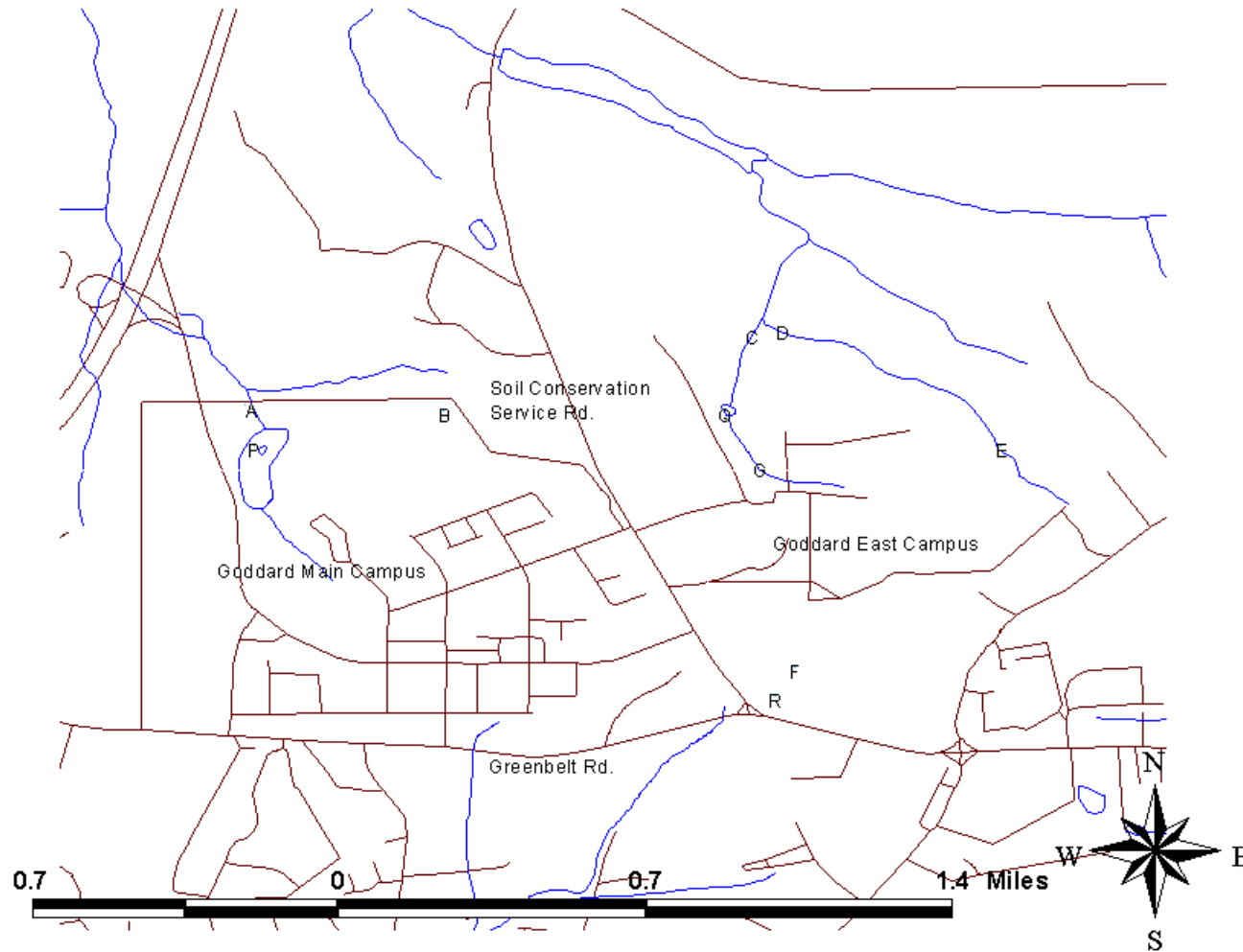


Figure 2. Sampling Sites at Goddard Space Flight Center. Letters A-G indicate Stream Sites. Letters P-R indicate Pond Sites.

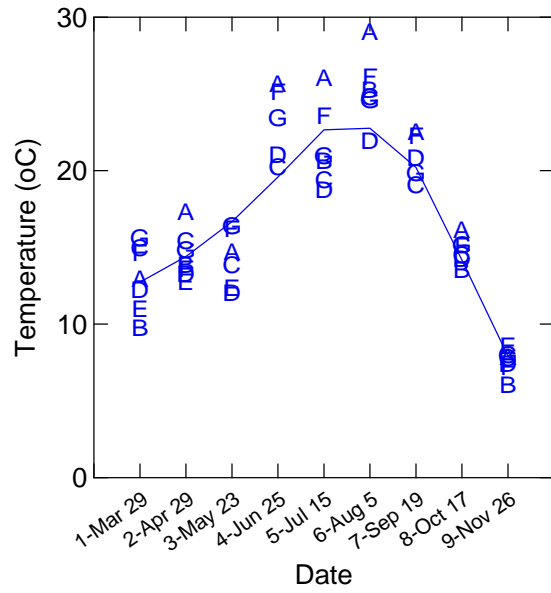


Figure 3. Stream Temperature (°C) by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

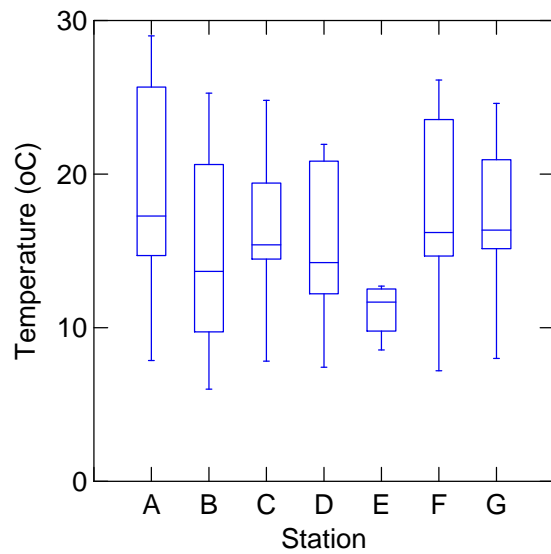


Figure 4. Stream Temperature (°C) by Station. All Dates Pooled.

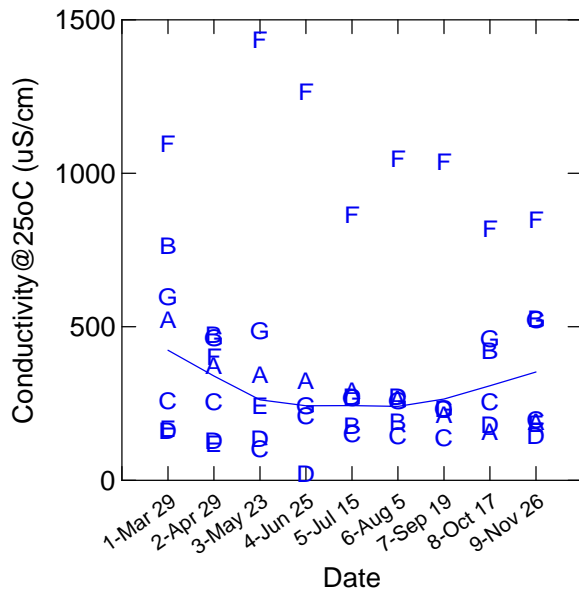


Figure 5 Stream Specific Conductance (uS/cm) by Sampling Date. Letters indicate Station ID.

Goddard Stream Stations: 2002

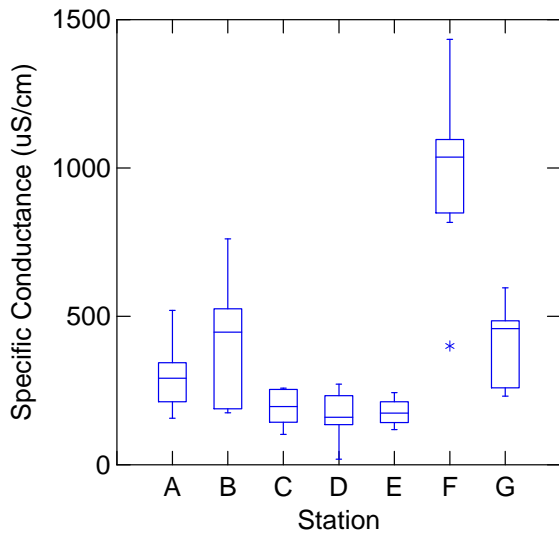
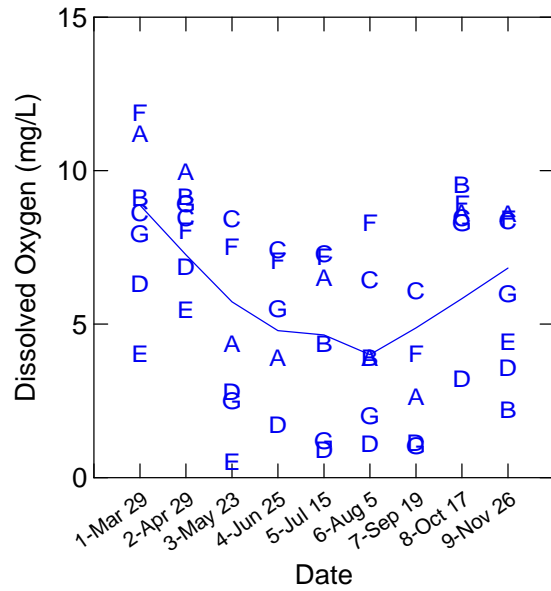


Figure 6. Stream Specific Conductance (uS/cm) by Station. All Dates Pooled.



Station 7. Stream Dissolved Oxygen (mg/L) by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

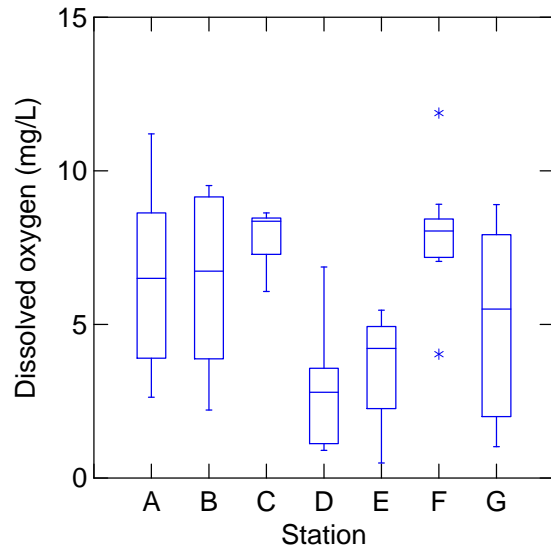


Figure 8. Stream Dissolved Oxygen (mg/L) by Station. All Dates Pooled.

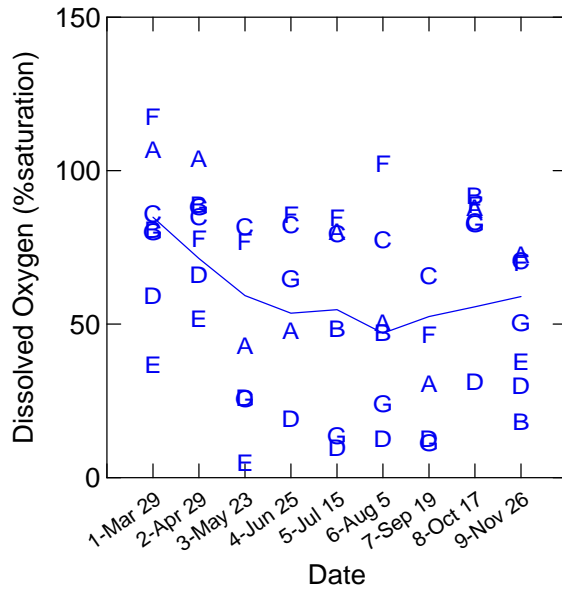


Figure 9. Stream Dissolved Oxygen (% saturation) by Sampling Date. Letters indicate Station ID.

Goddard Stream Stations: 2002

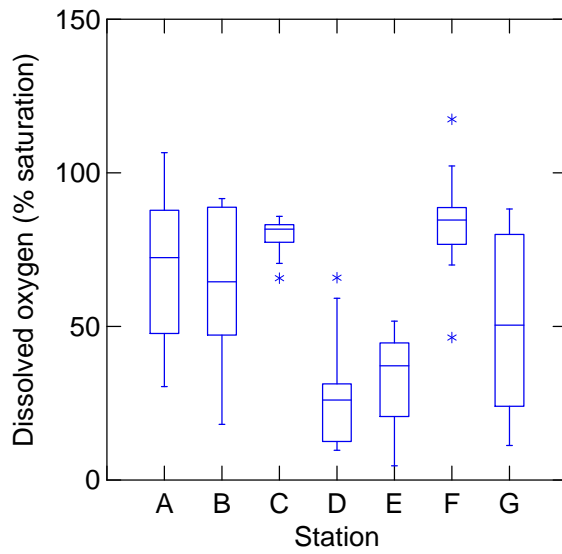


Figure 10. Stream Dissolved Oxygen (% saturation) by Station. All Dates Pooled.

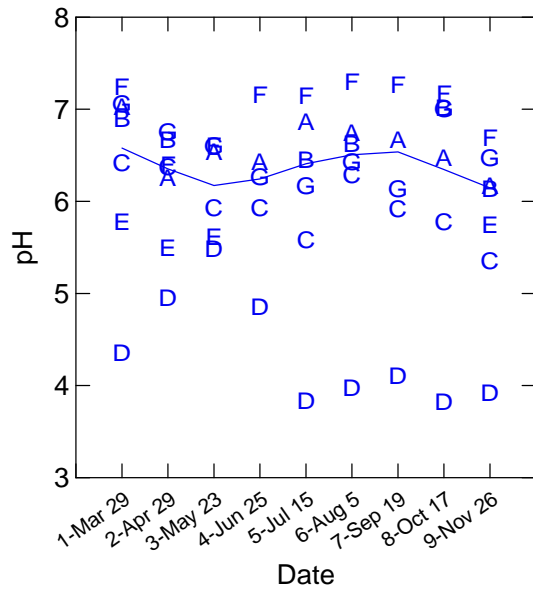


Figure 11. Stream pH by Sampling Date. Letters indicate Station ID.

Goddard Stream Stations: 2002

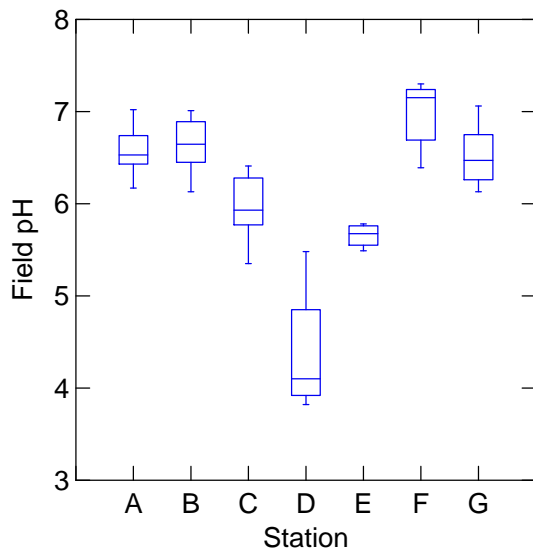


Figure 12. Stream pH by Station. All Dates Pooled.

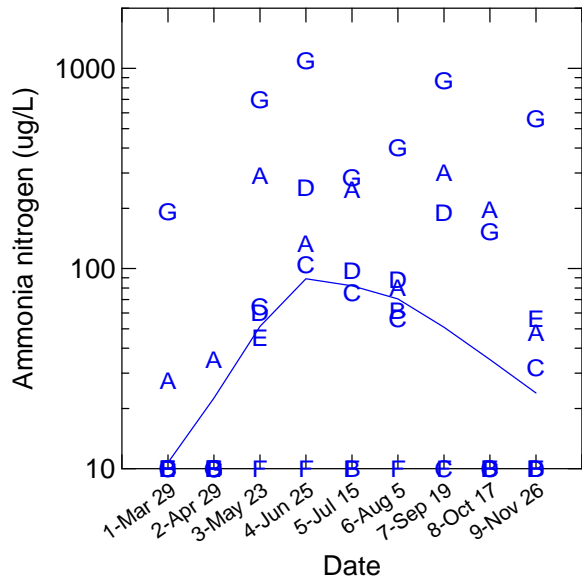


Figure 13. Stream Ammonia Nitrogen (ug/L) by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

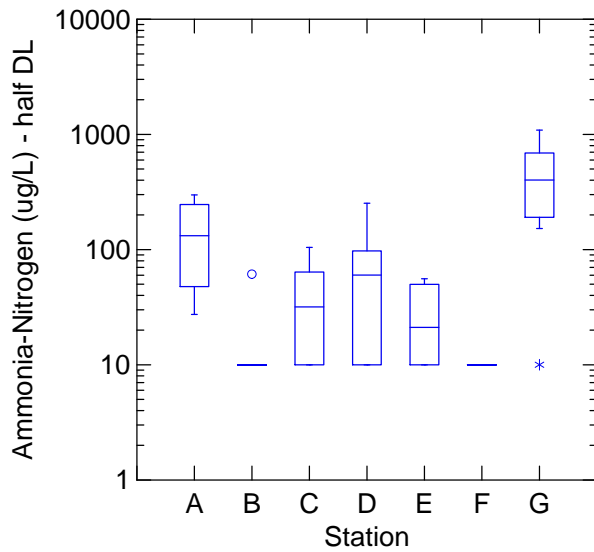


Figure 14. Stream Ammonia Nitrogen (ug/L) by Station. All Dates Pooled.

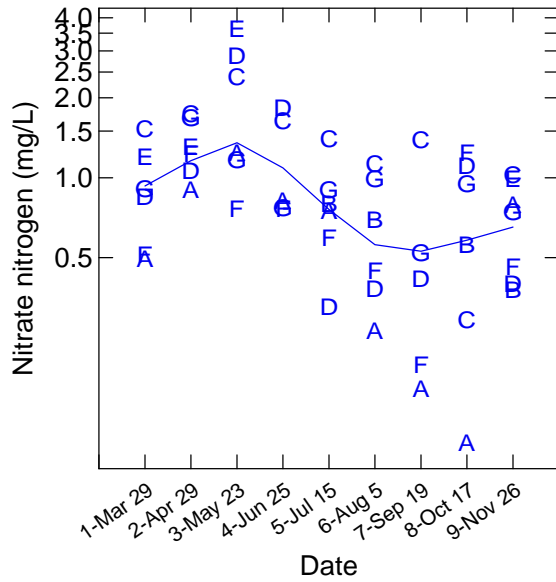


Figure 15. Stream Nitrate Nitrogen (mg/L) by Sampling Date. Letters indicate Station ID.

Goddard Stream Stations: 2002

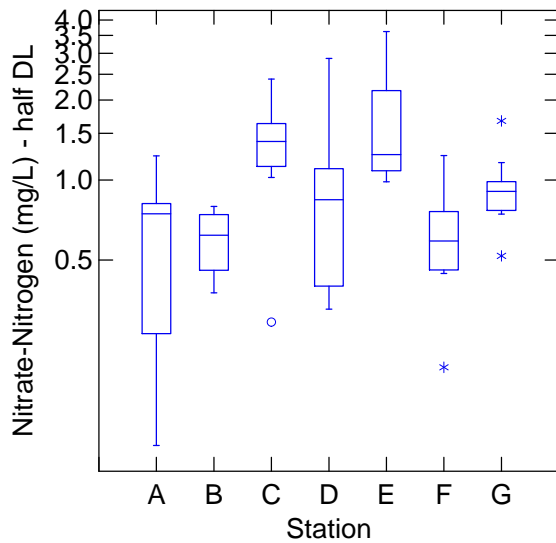


Figure 16. Stream Nitrate Nitrogen (mg/L) by Station. All Dates Pooled.

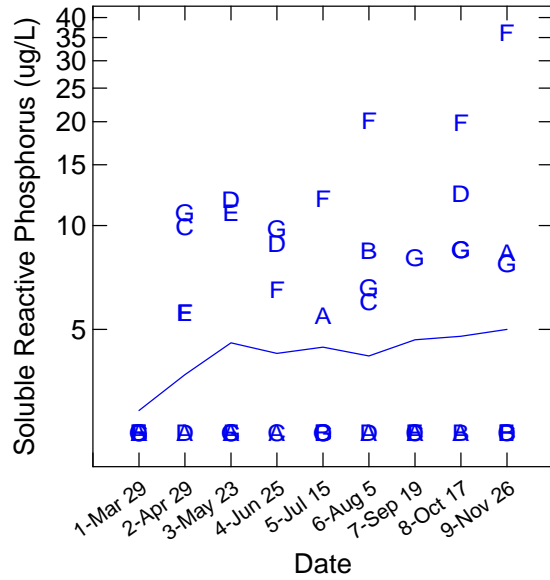


Figure 17. Stream Soluble Reactive Phosphorus (ug/L) by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

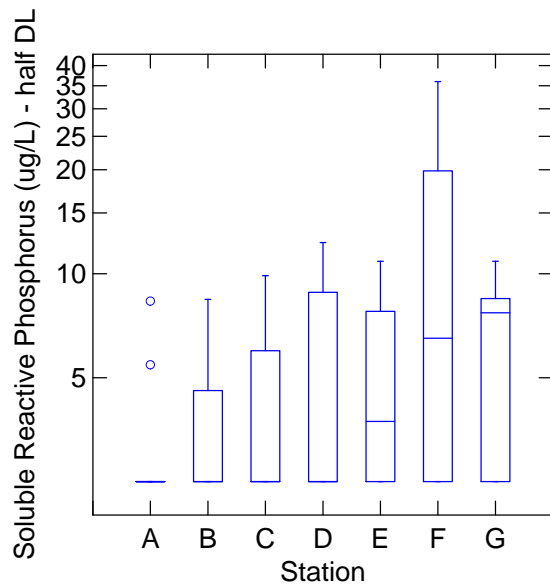


Figure 18. Stream Soluble Reactive Phosphorus (ug/L) by Station. All Dates Pooled.

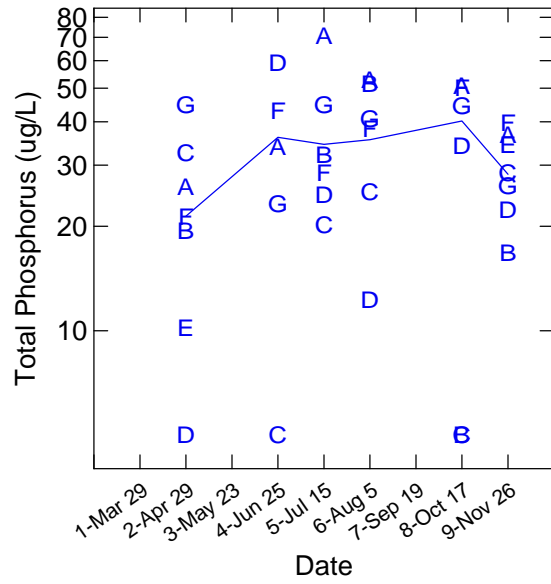


Figure 19. Stream Total Phosphorus (ug/L) by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

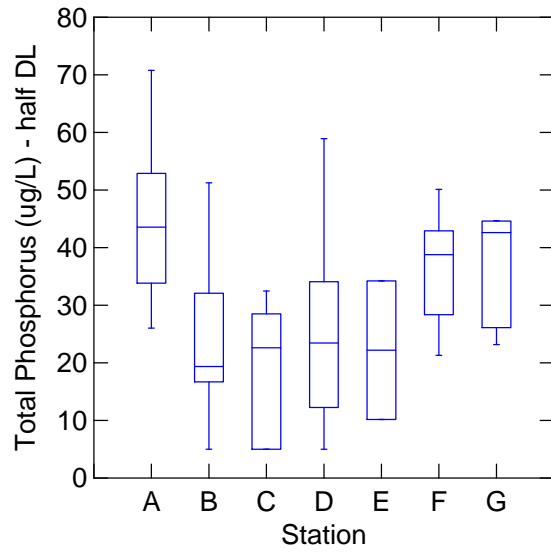


Figure 20. Stream Total Phosphorus (ug/L) by Station. All Dates Pooled.

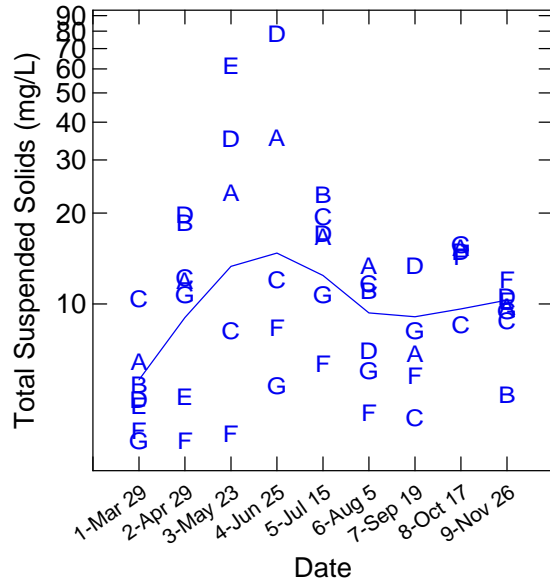


Figure 21. Stream Total Suspended Solids (mg/L) by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

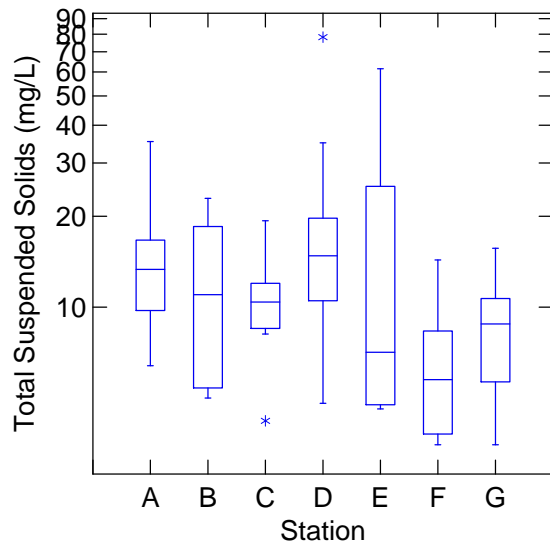


Figure 22. Stream Total Suspended Solids (mg/L) by Station. All Dates Pooled.

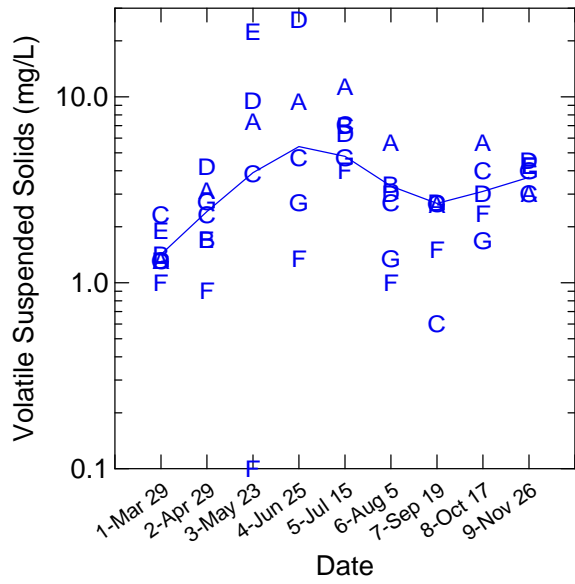


Figure 23. Volatile Suspended Solids (mg/L) by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

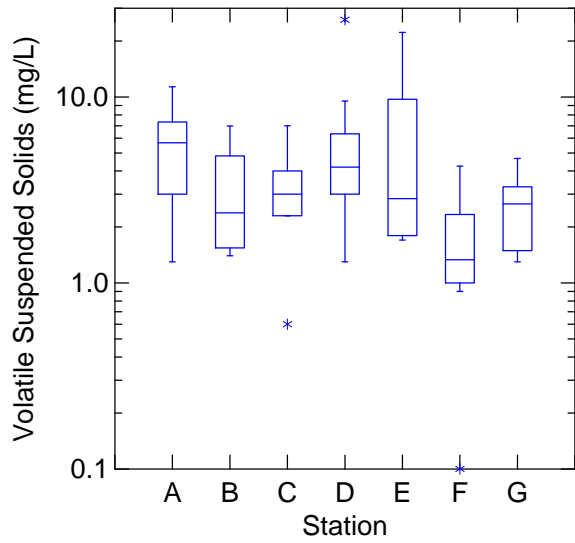


Figure 24. Volatile Suspended Solids (mg/L) by Station. All Dates Pooled.

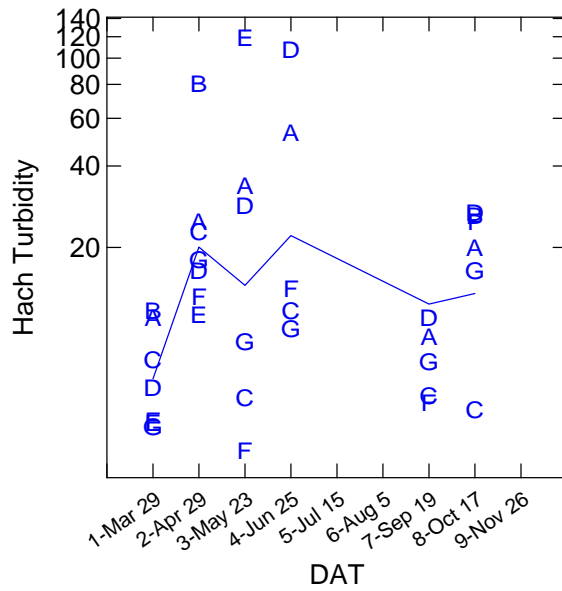


Figure 25. Stream Hach Turbidity by Sampling Date. Letters Indicate Station ID.

Goddard Stream Stations: 2002

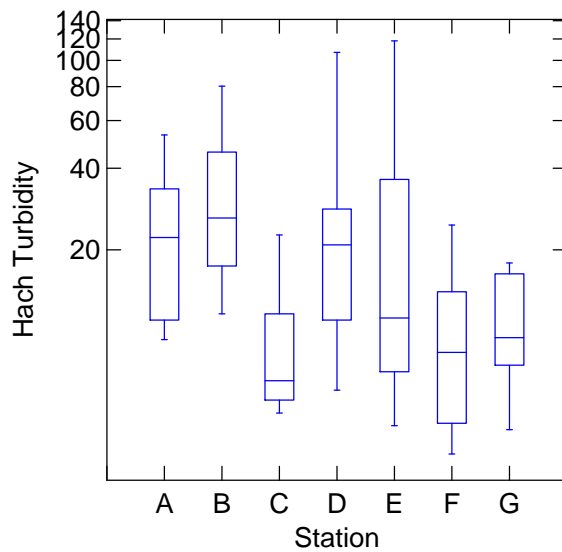


Figure 26. Stream Hach Turbidity by Station. All Dates Pooled.

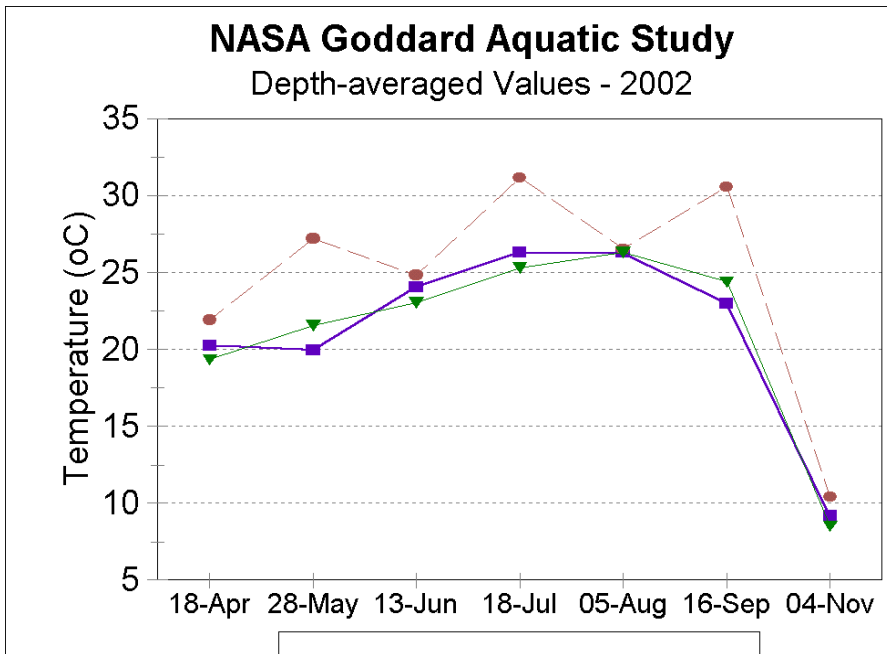


Figure 27. Average Pond Temperature (EC) by Sampling Date.

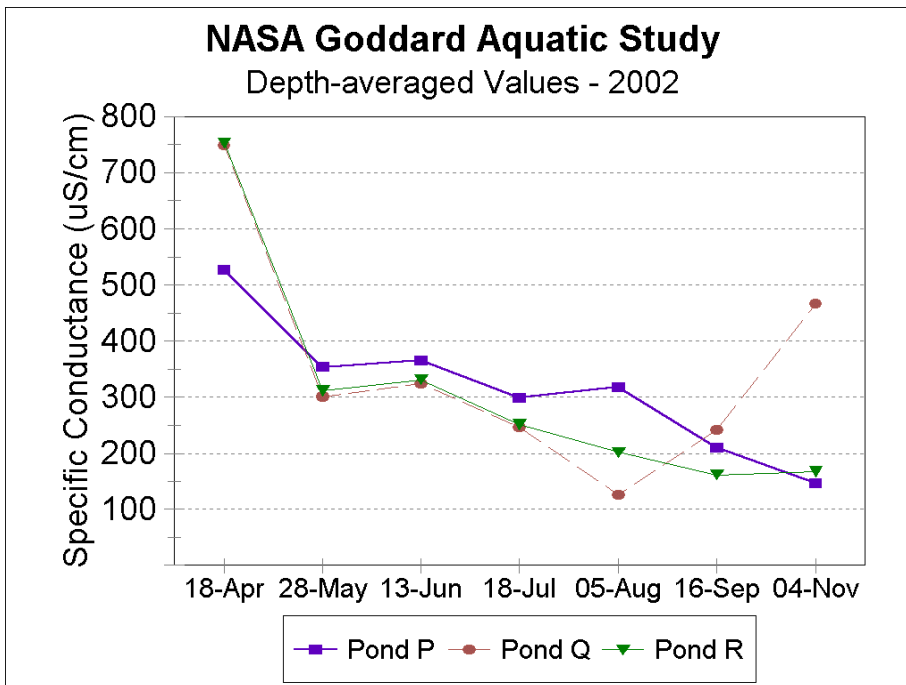


Figure 28. Average Pond Specific Conductance (uS/cm) by Sampling Date.

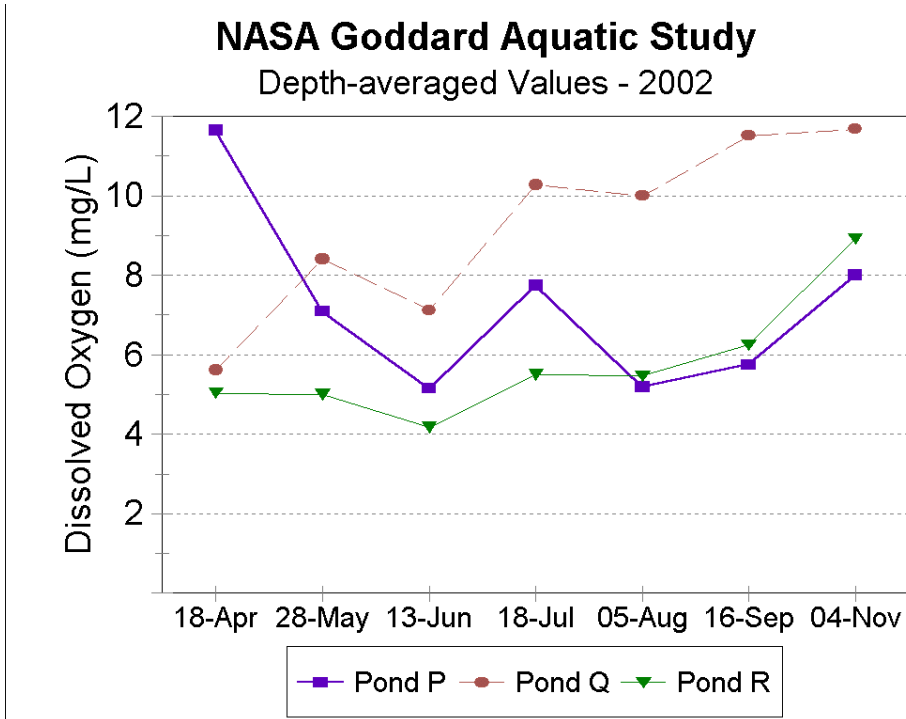


Figure 29. Average Pond Dissolved Oxygen (mg/L) by Sampling Date.

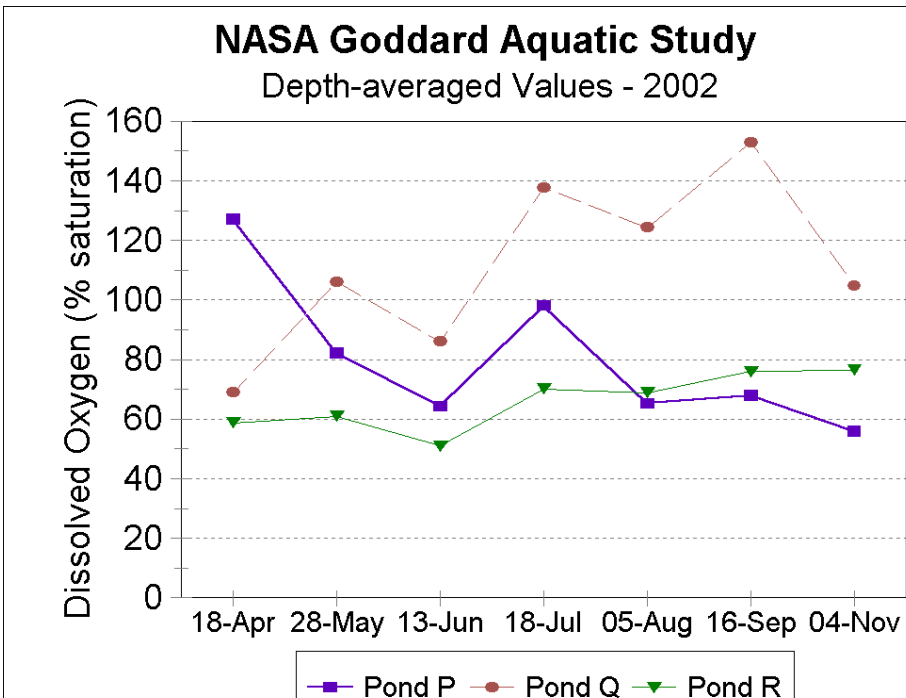


Figure 30. Average Pond Dissolved Oxygen (% saturation) by Sampling Date.

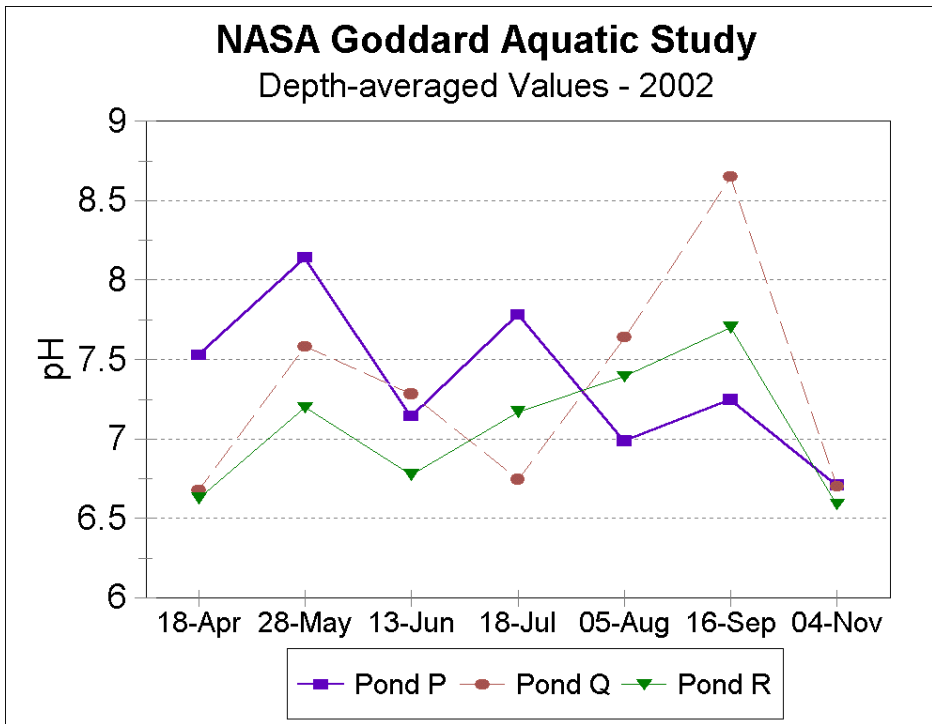


Figure 31. Average Pond pH by Sampling Date.

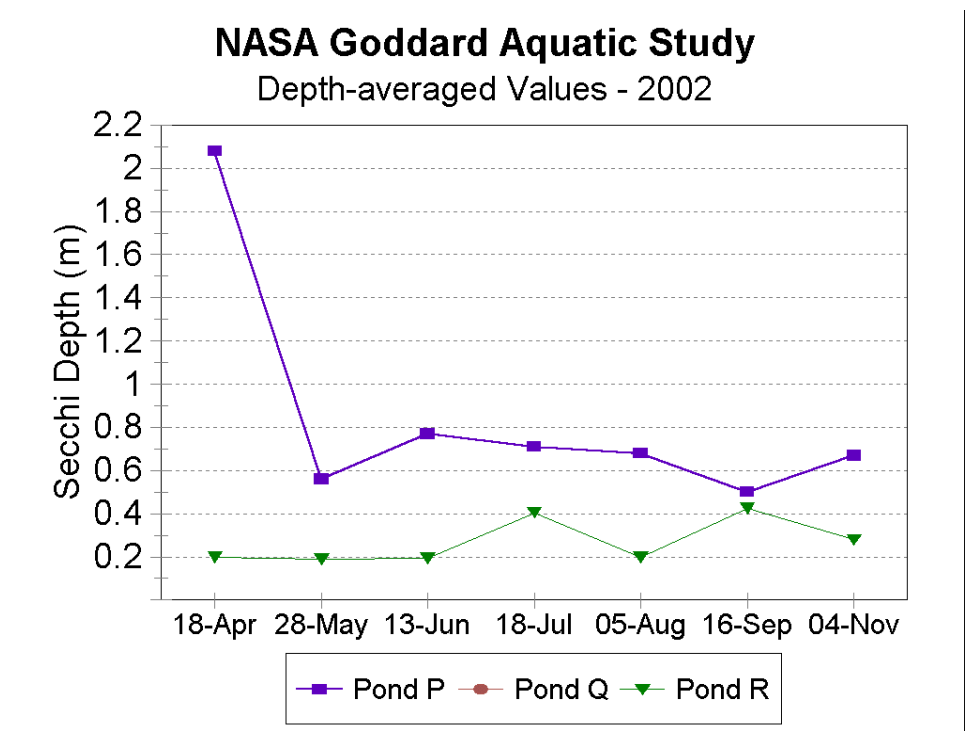


Figure 32. Average Pond Secchi Depth (m) by Sampling Date.

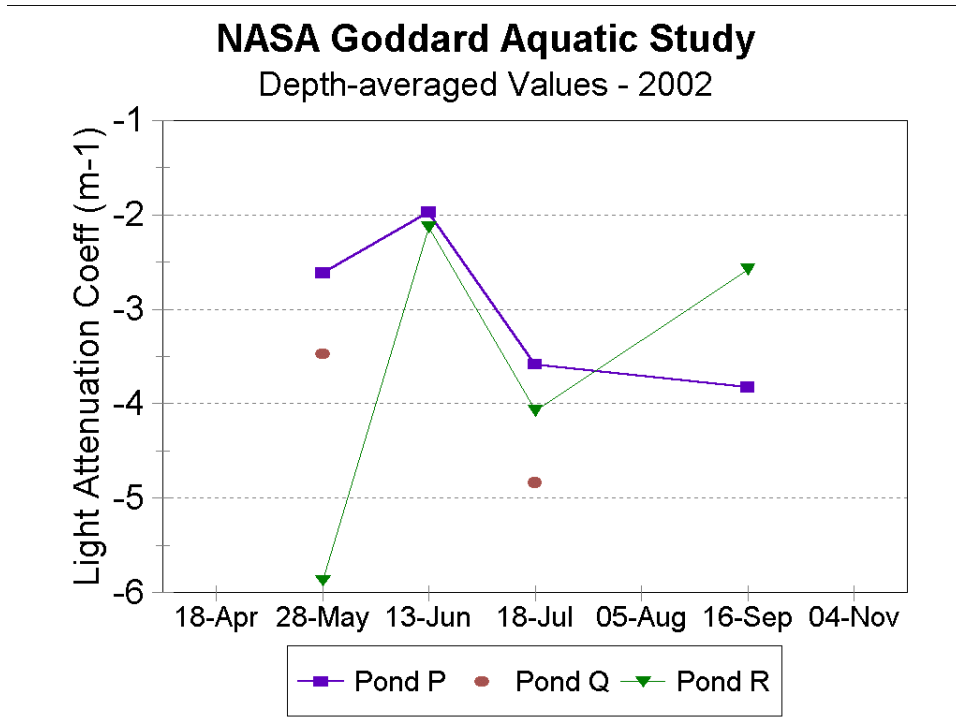


Figure 33. Average Pond Light Attenuation Coefficient (m^{-1}) by Sampling Date.

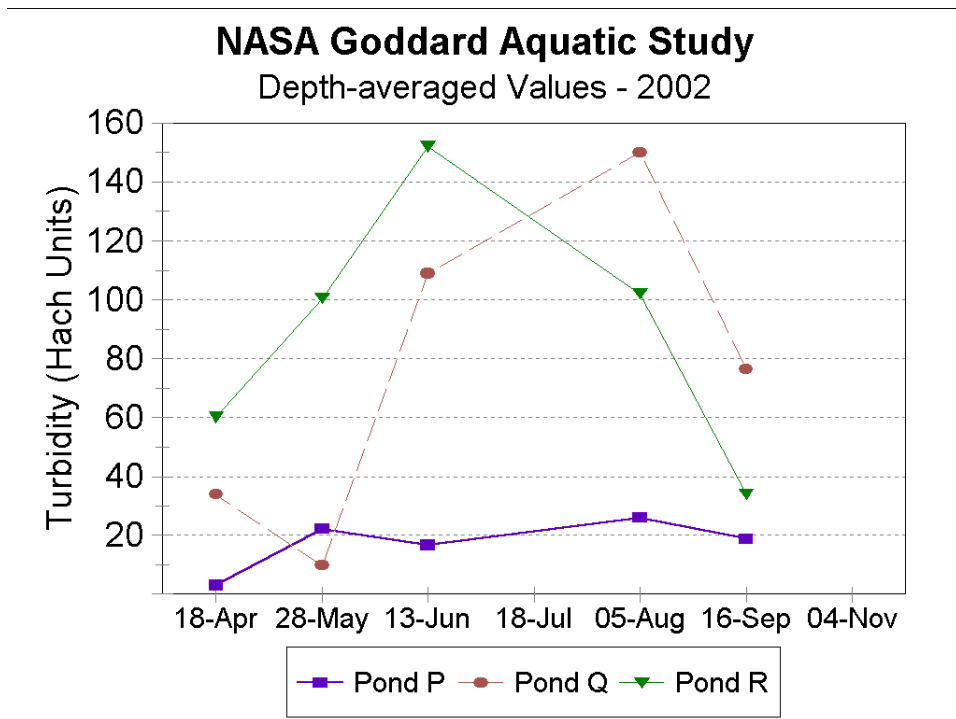


Figure 34. Average Pond Hach Turbidity by Sampling Date.

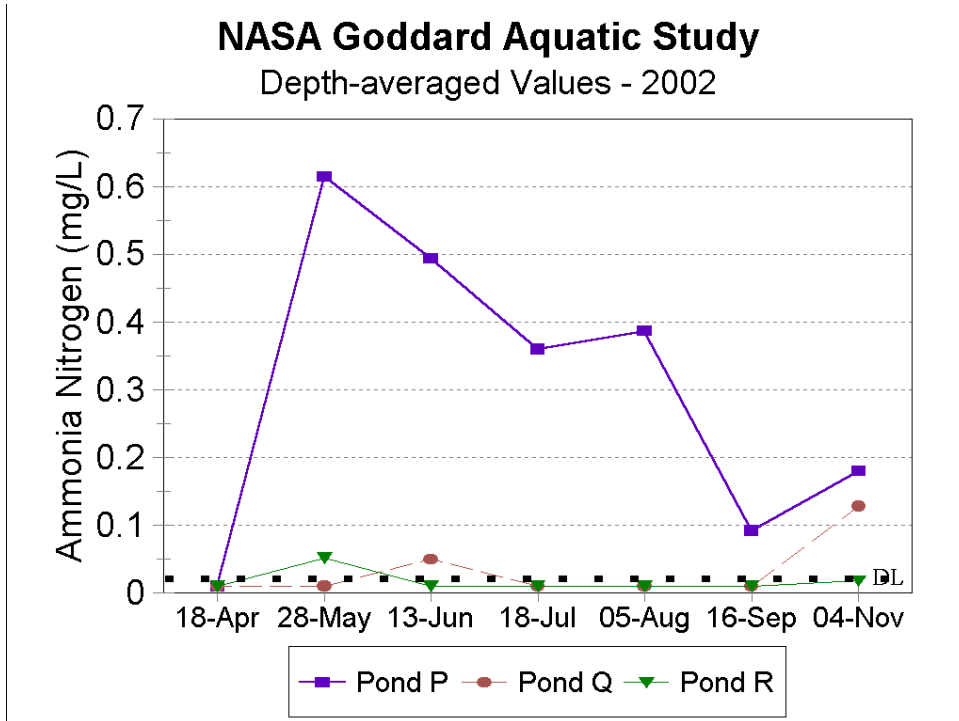


Figure 35. Average Pond Ammonia Nitrogen (mg/L) by Sampling Date.

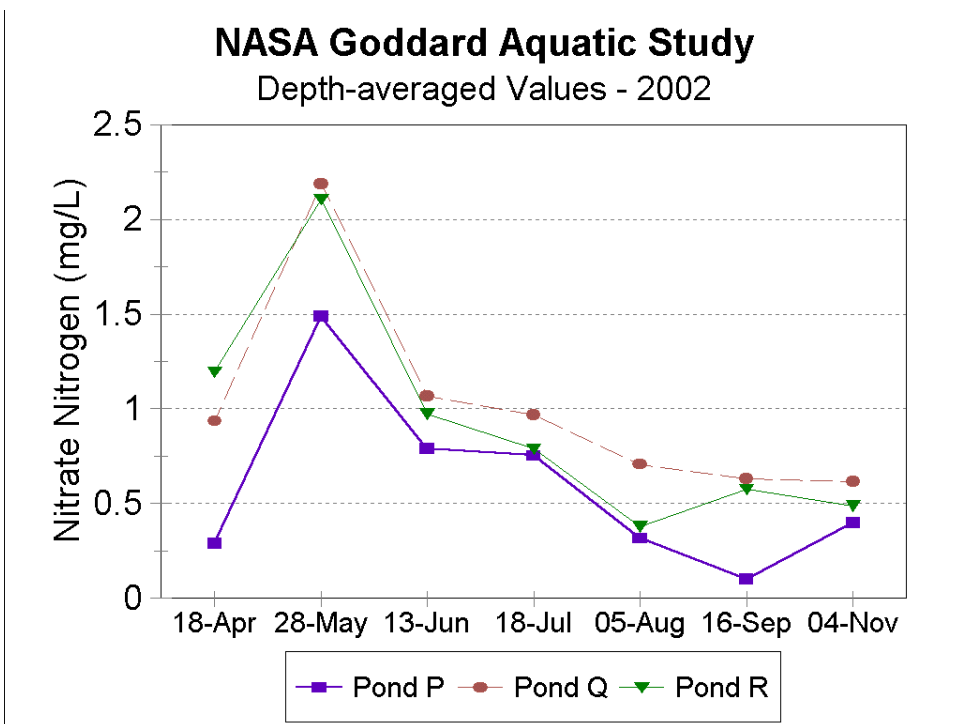


Figure 36. Average Pond Nitrate Nitrogen (mg/L) by Sampling Date.

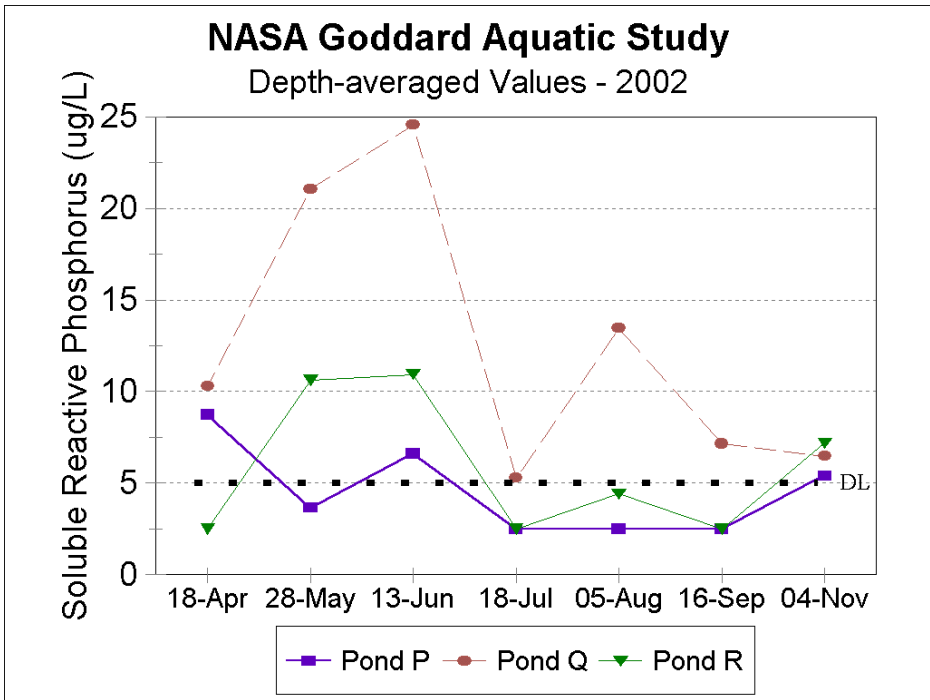


Figure 37. Average Pond Soluble Reactive Phosphorus (ug/L) by Sampling Date.

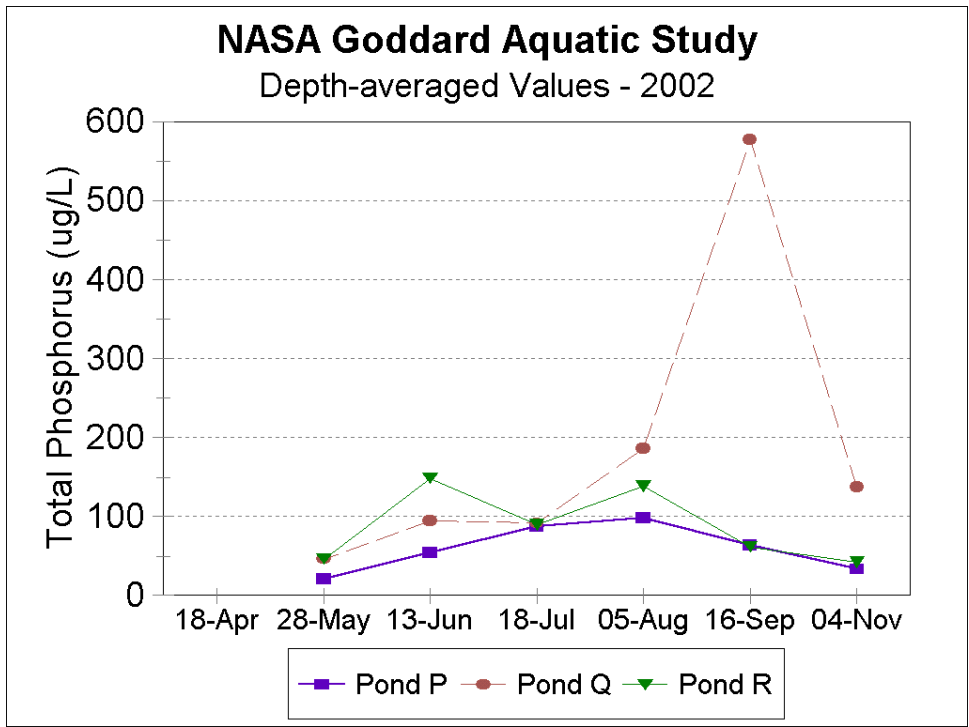


Figure 38. Average Pond Total Phosphorus (ug/L) by Sampling Date.

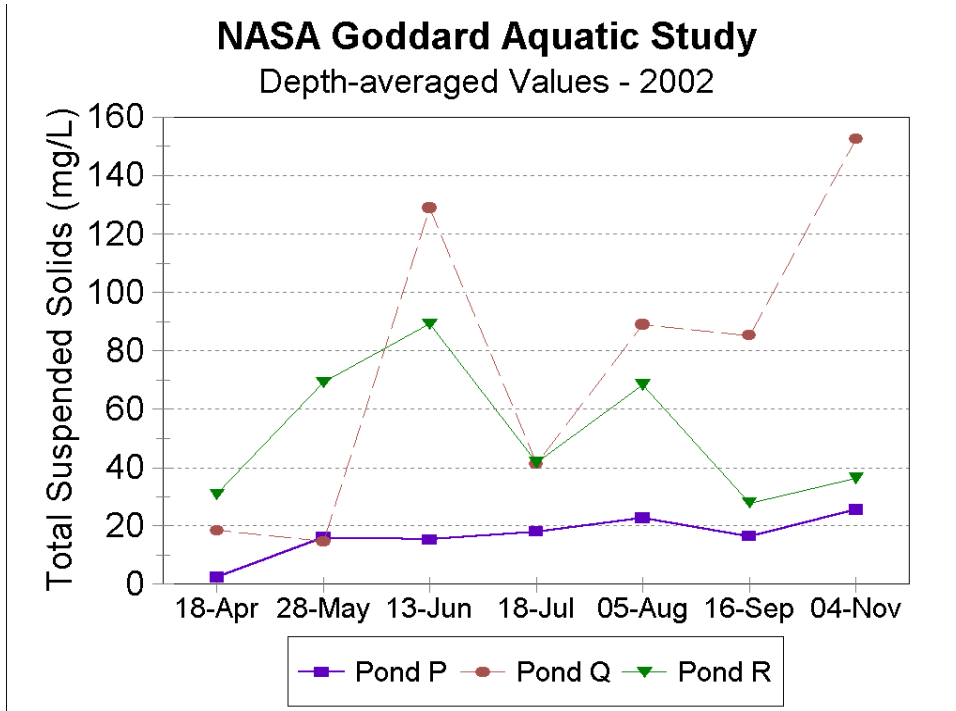


Figure 39. Average Pond Total Suspended Solids (mg/L) by Sampling Date.

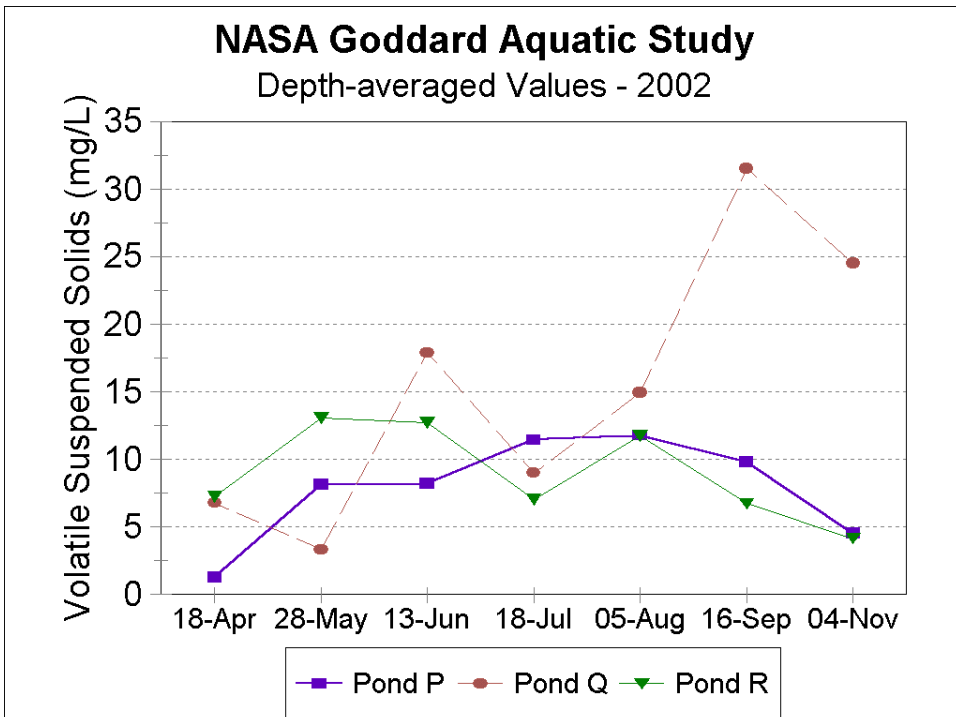


Figure 40. Average Pond Volatile Suspended Solids (mg/L) by Sampling Date.

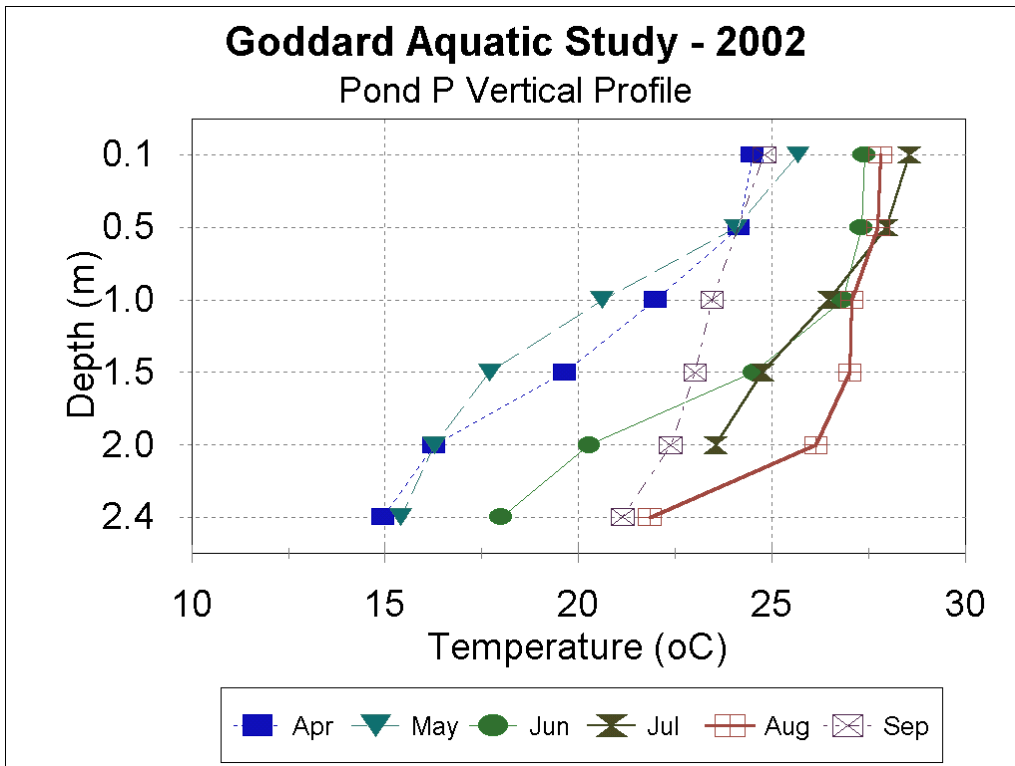


Figure 41. Temperature (EC) Vertical Profile in Pond P by Sampling Date.

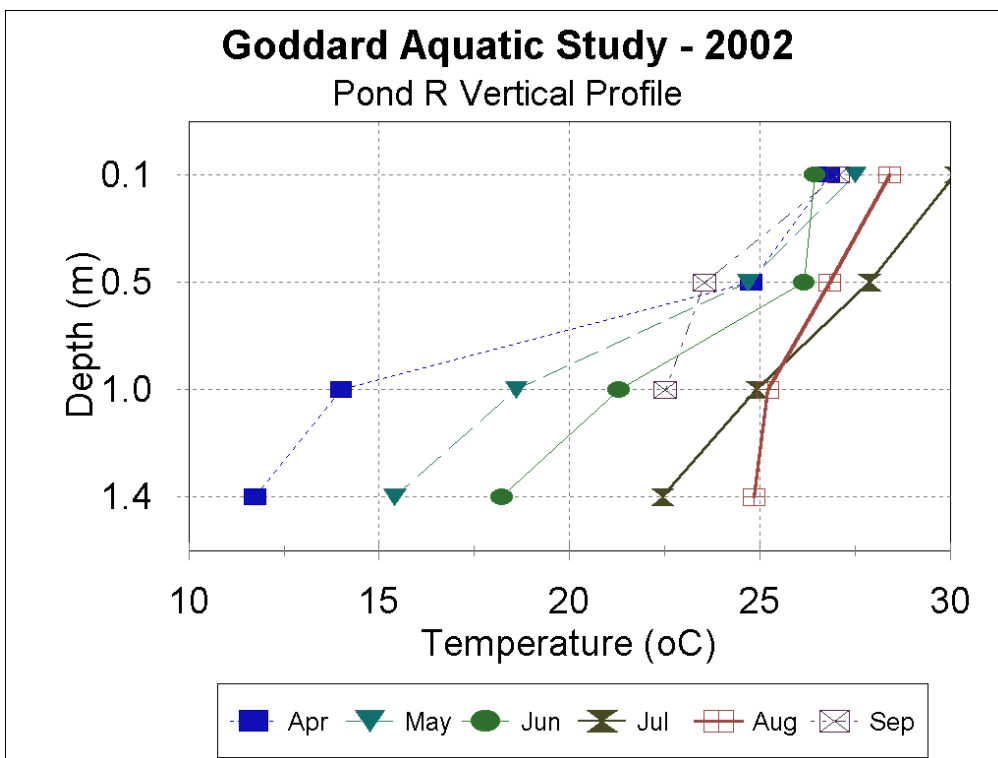


Figure 42. Temperature (EC) Vertical Profile in Pond R by Sampling Date.

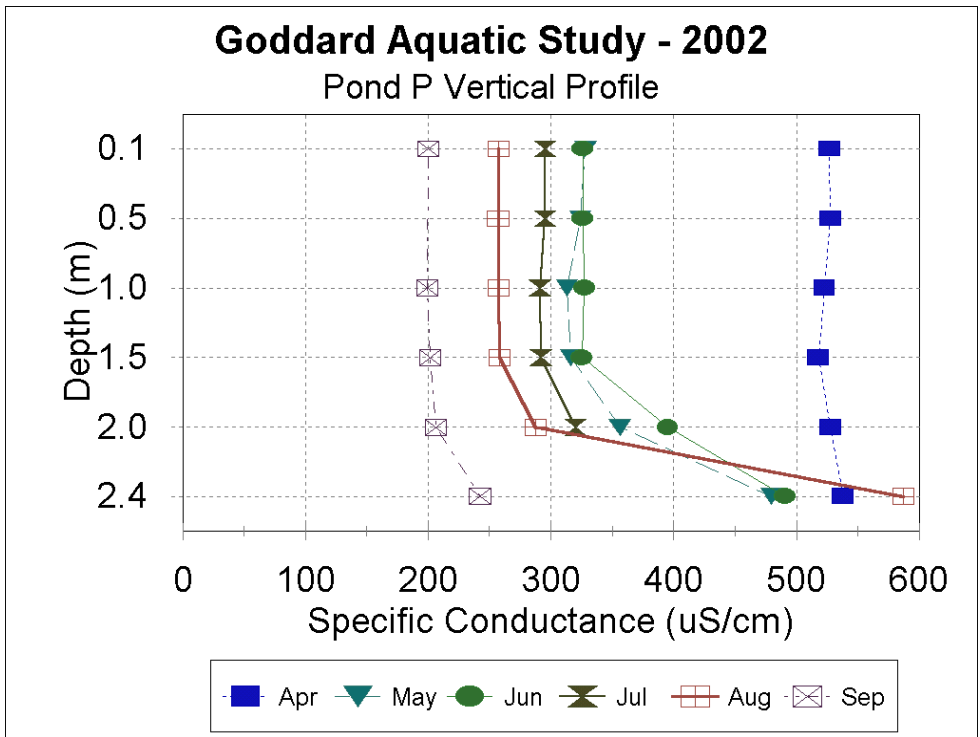


Figure 43. Specific Conductance (uS/cm) Vertical Profile in Pond P by Sampling Date.

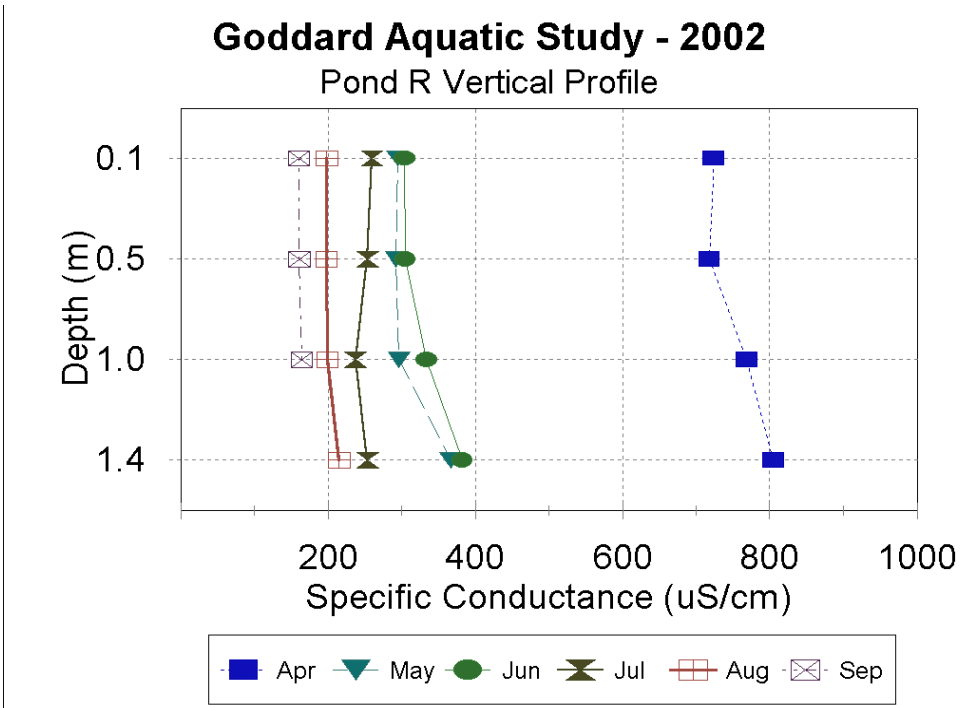


Figure 44. Specific Conductance (uS/cm) Vertical Profile in Pond P by Sampling Date.

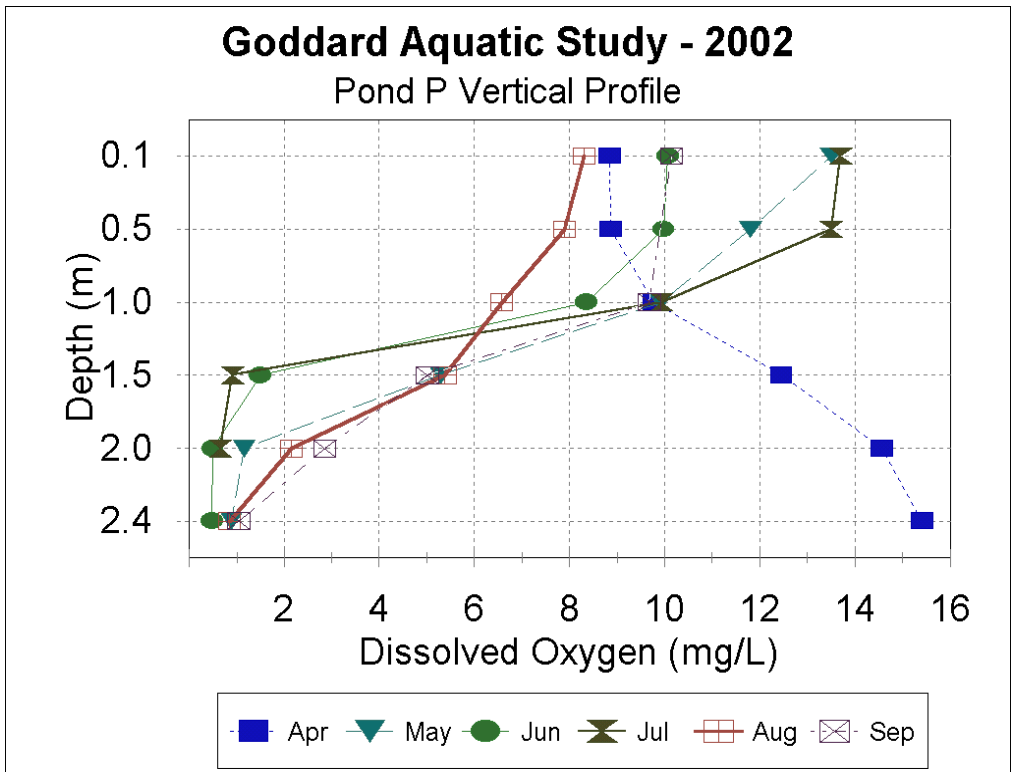


Figure 45. Dissolved Oxygen (mg/L) Vertical Profile in Pond P by Sampling Date.

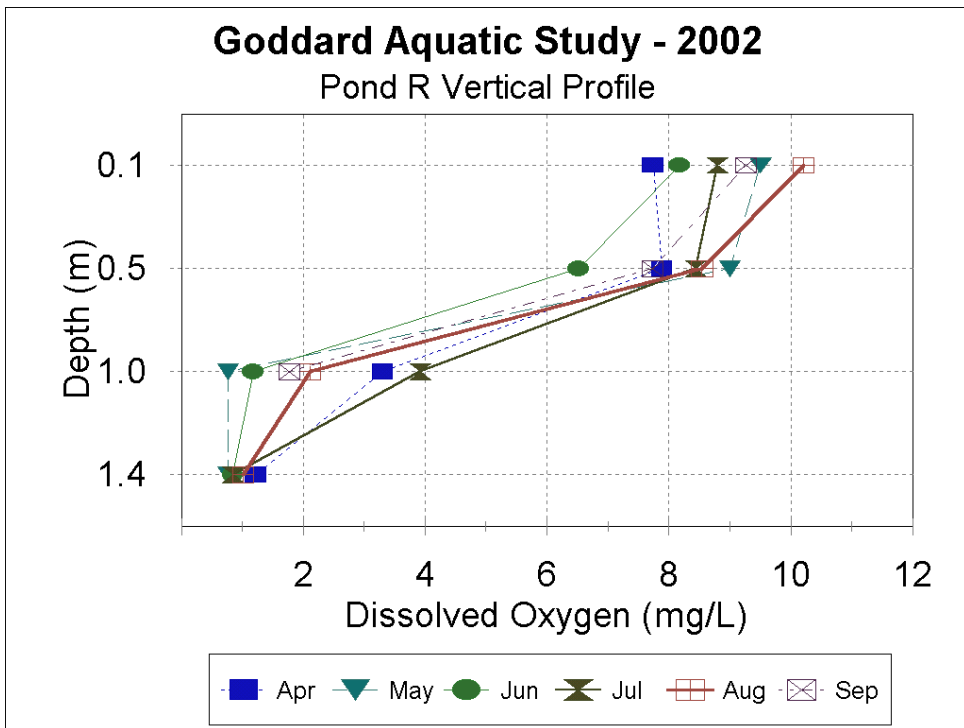


Figure 46. Dissolved Oxygen (mg/L) Vertical Profile in Pond R by Sampling Date.

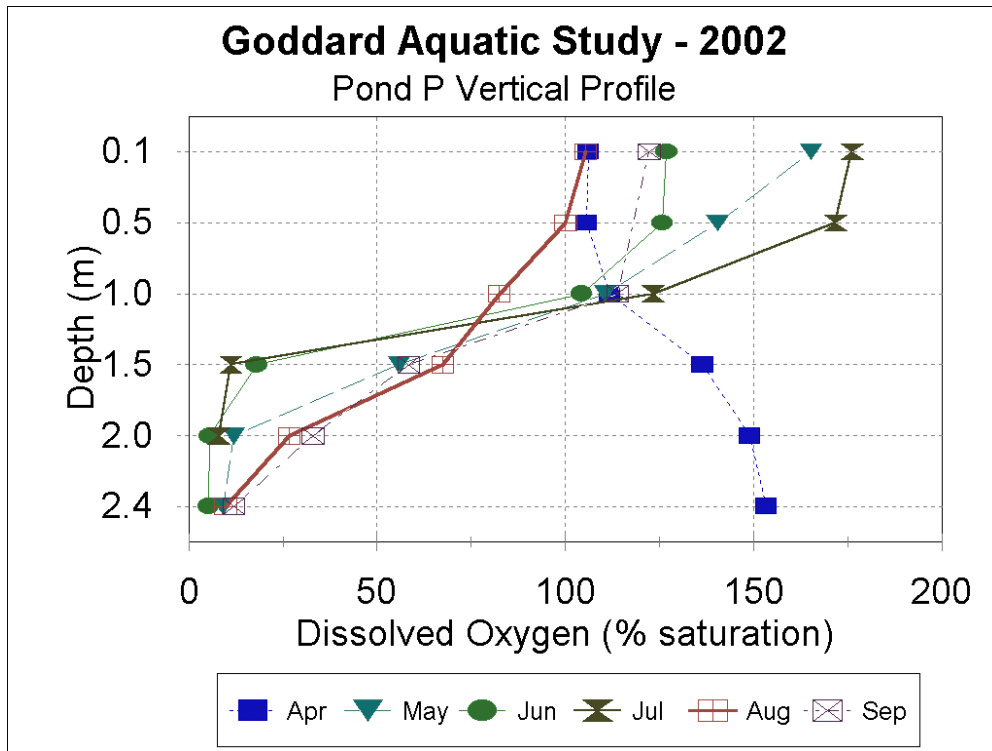


Figure 47. Dissolved Oxygen (% saturation) Vertical Profile in Pond P by Sampling Date.

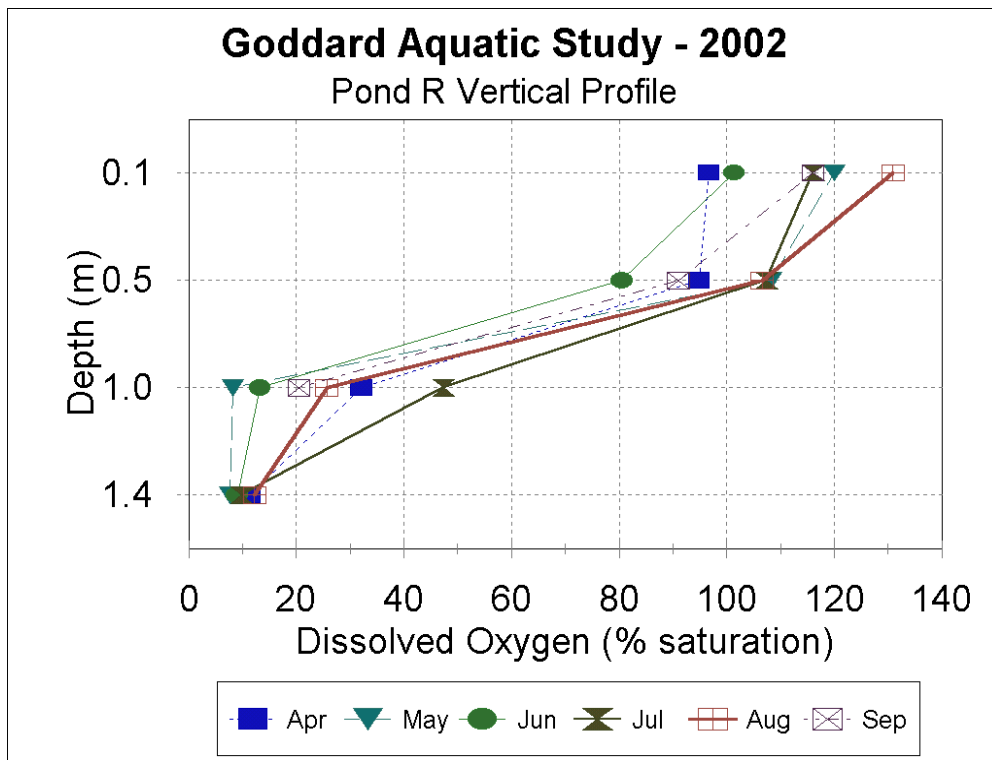


Figure 48. Dissolved Oxygen (% saturation) Vertical Profile in Pond R by Sampling Date.

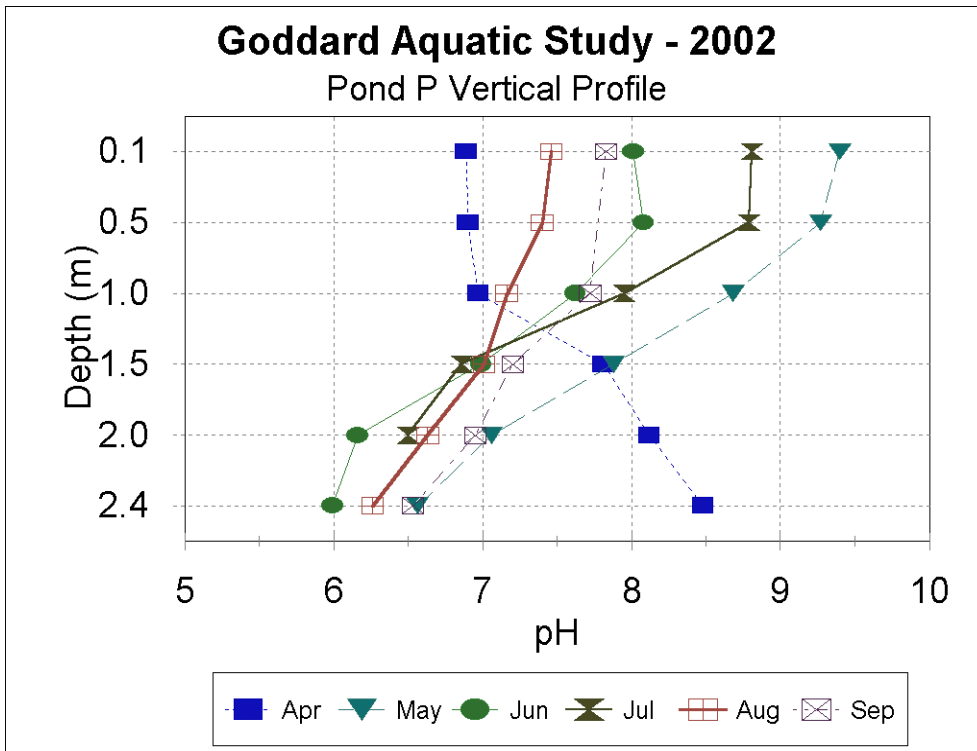


Figure 49. pH Vertical Profile in Pond P by Sampling Date.

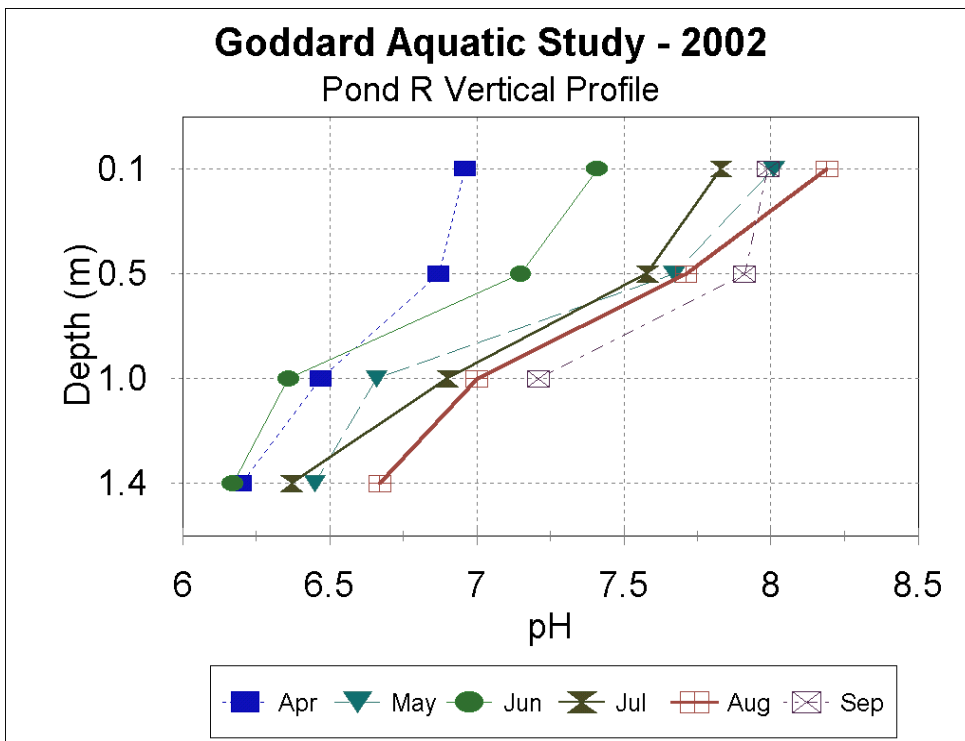


Figure 50. pH Vertical Profile in Pond R by Sampling Date.

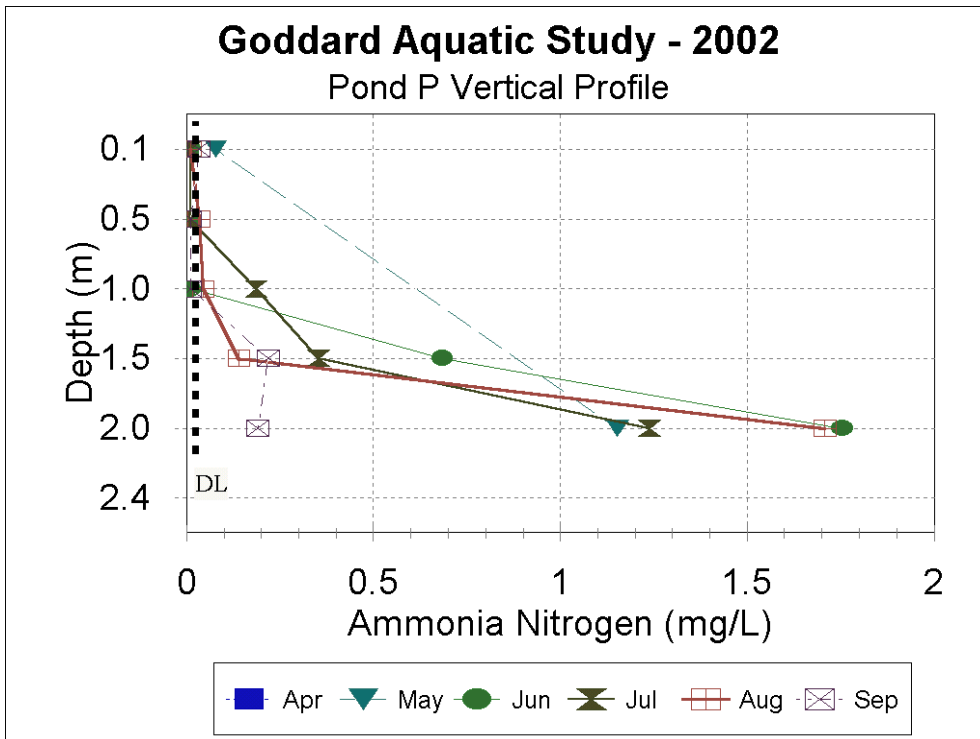


Figure 51. Ammonia Nitrogen (mg/L) Vertical Profile in Pond P by Sampling Date.

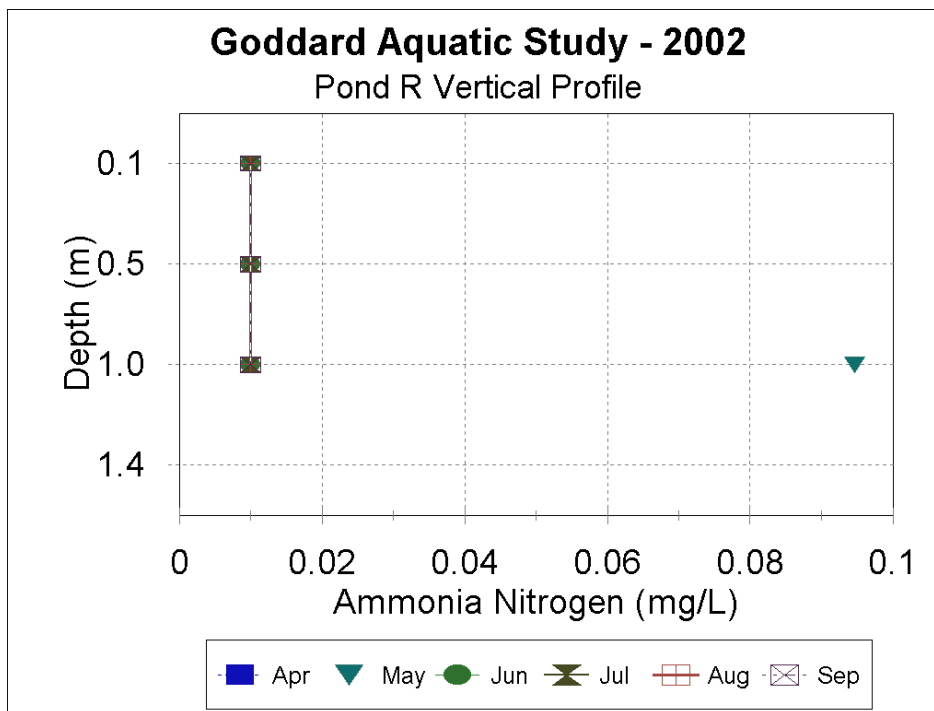


Figure 52. Ammonia Nitrogen (mg/L) Vertical Profile in Pond R by Sampling Date.

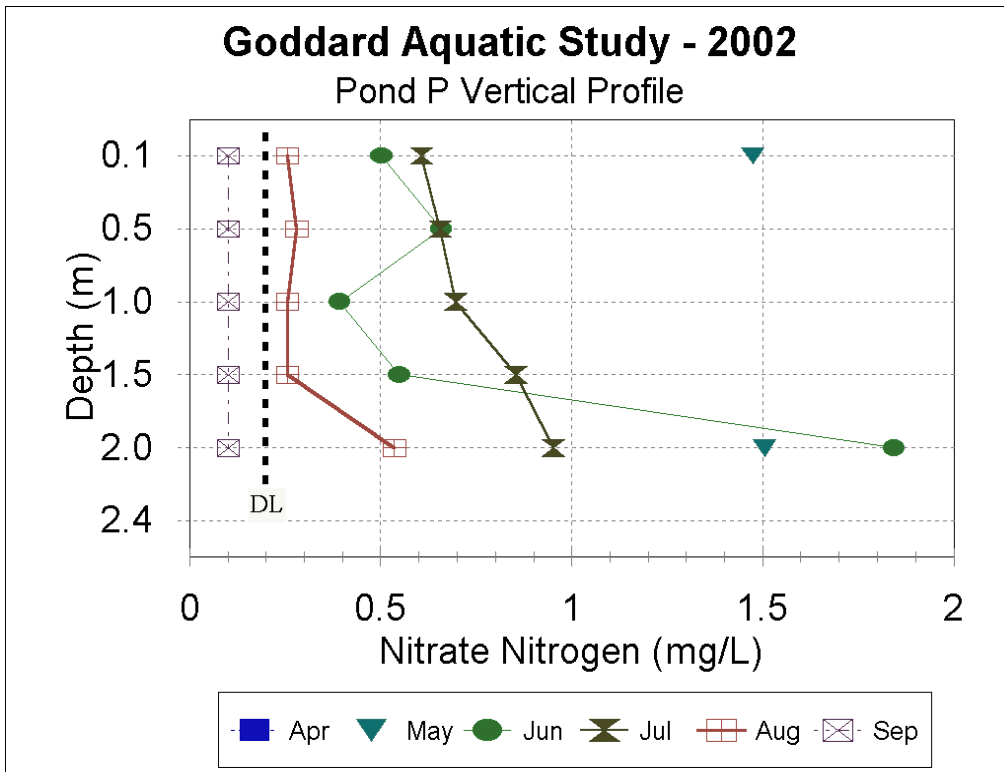


Figure 53. Nitrate Nitrogen (mg/L) Vertical Profile in Pond P by Sampling Date.

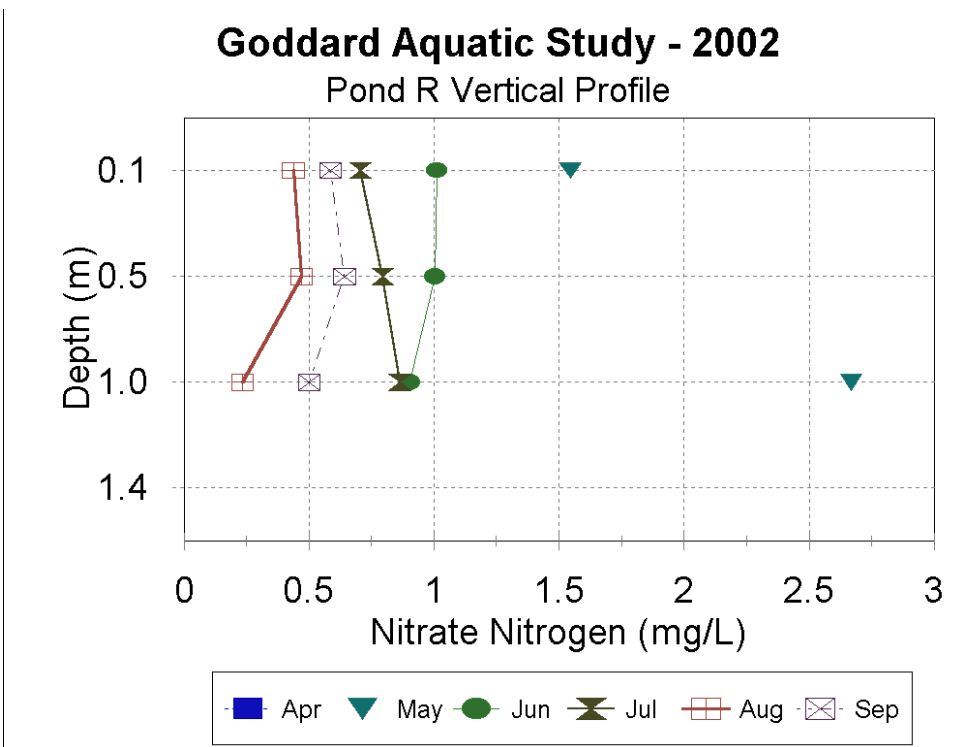


Figure 54. Nitrate Nitrogen (mg/L) Vertical Profile in Pond P by Sampling Date.

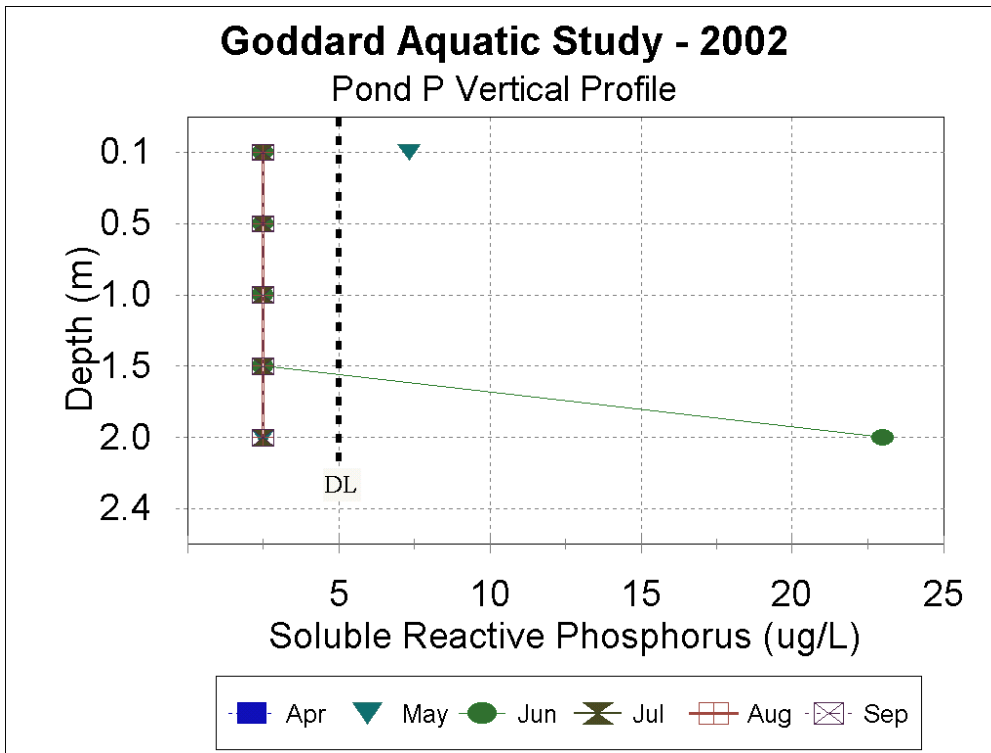


Figure 55. Soluble Reactive Phosphorus (ug/L) Vertical Profile in Pond P by Sampling Date.

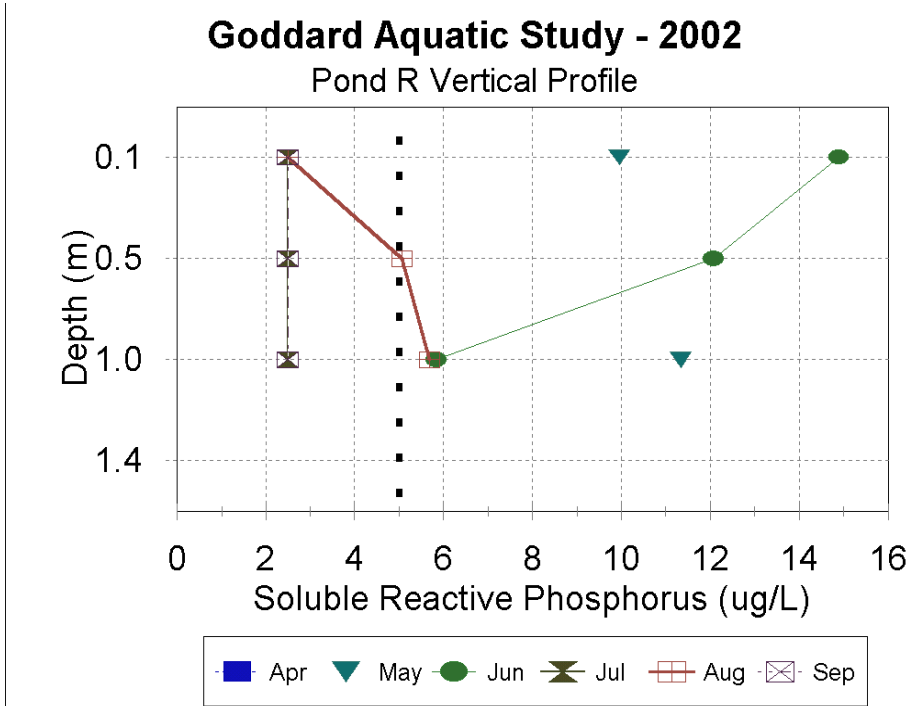


Figure 56. Soluble Reactive Phosphorus (ug/L) Vertical Profile in Pond R by Sampling Date.

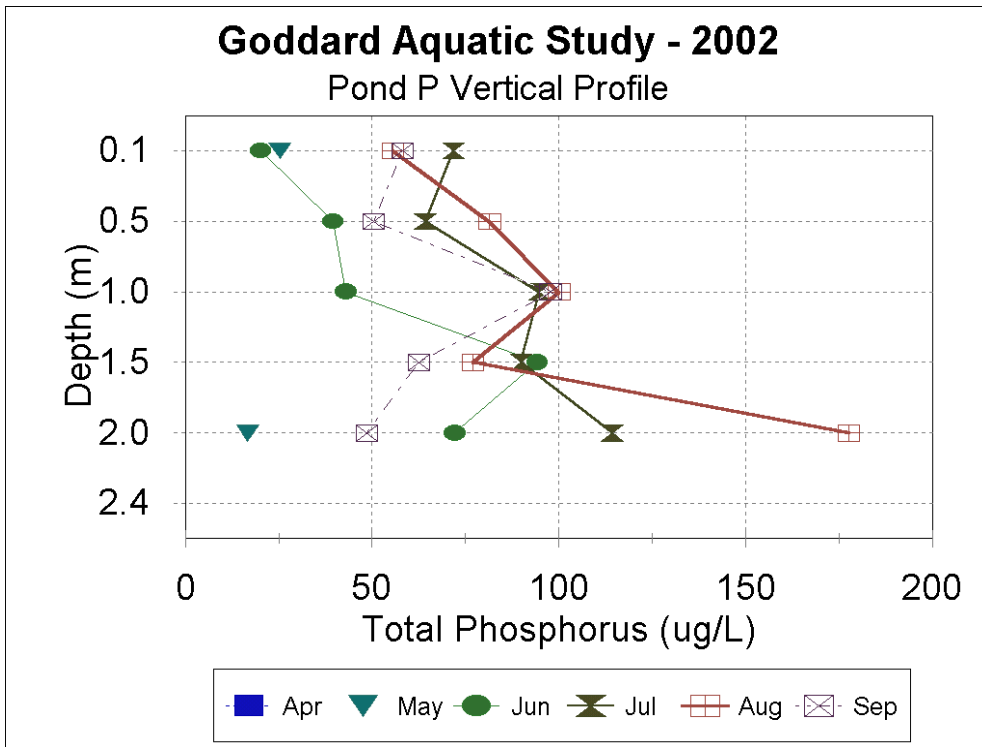


Figure 57. Total Phosphorus (ug/L) Vertical Profile in Pond P by Sampling Date.

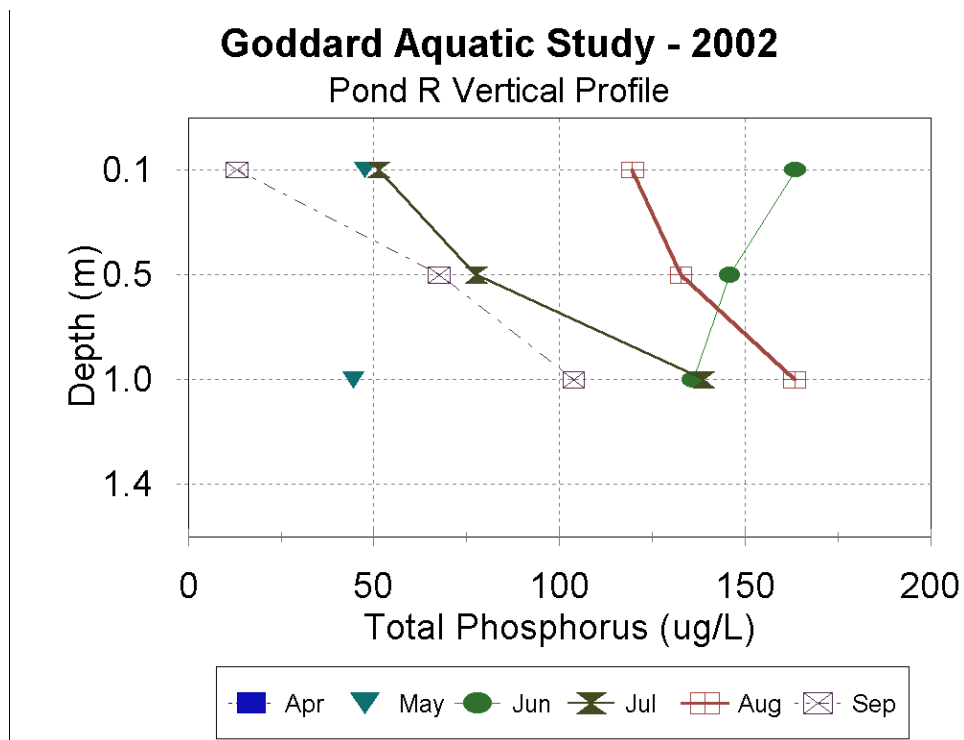


Figure 58. Total Phosphorus (ug/L) Vertical Profile in Pond R by Sampling Date.

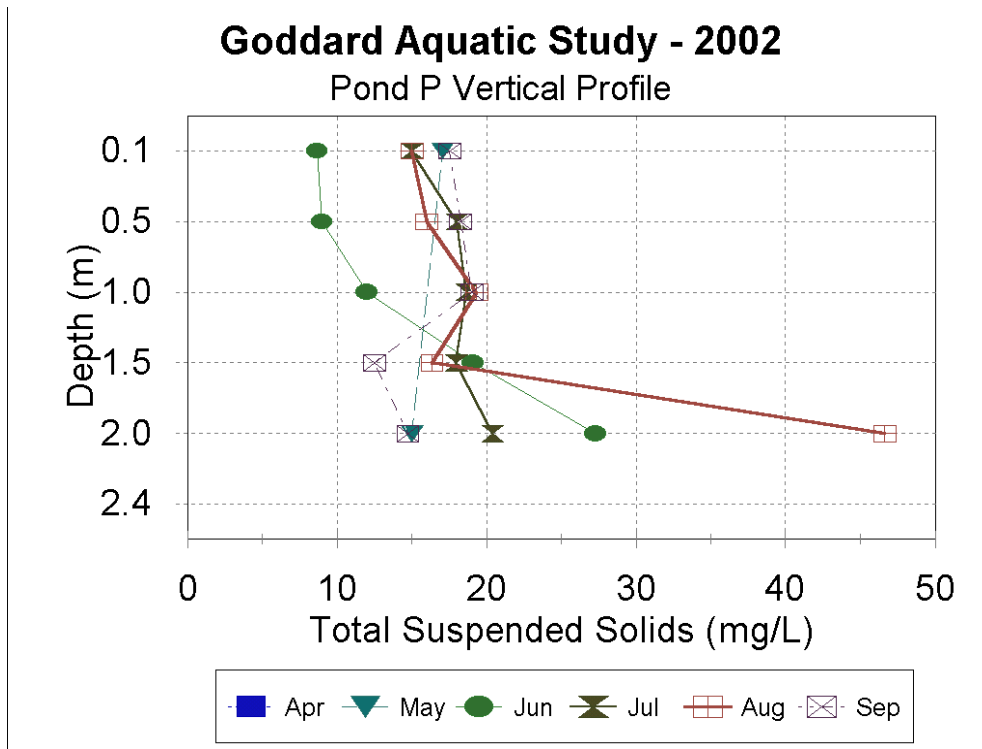


Figure 59. Total Suspended Solids (mg/L) Vertical Profile in Pond P by Sampling Date.

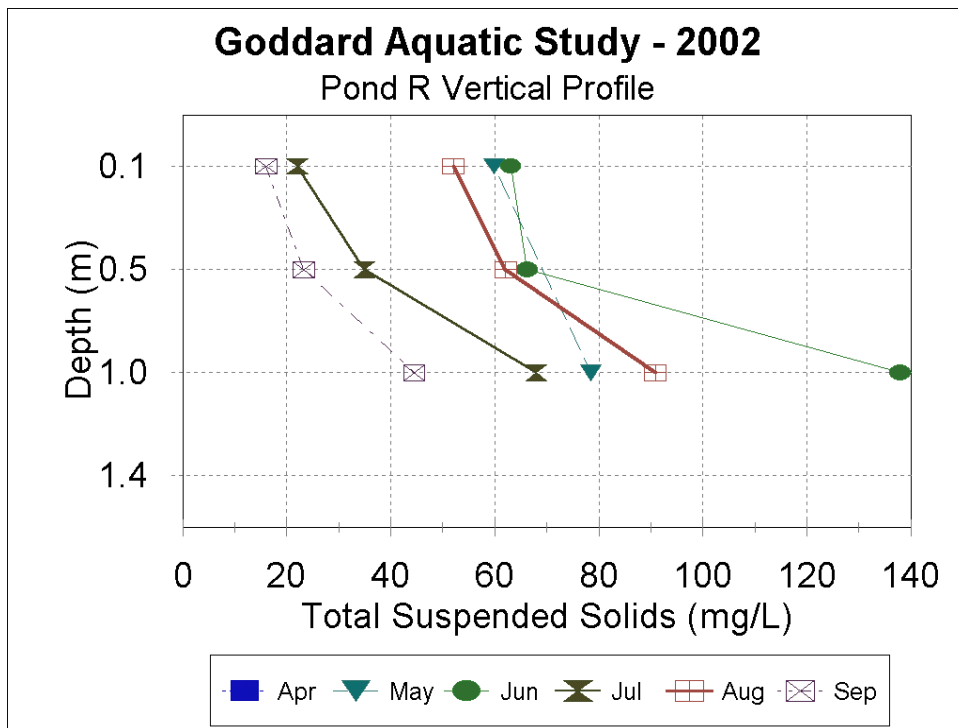


Figure 60. Total Suspended Solids (mg/L) Vertical Profile in Pond R by Sampling Date.

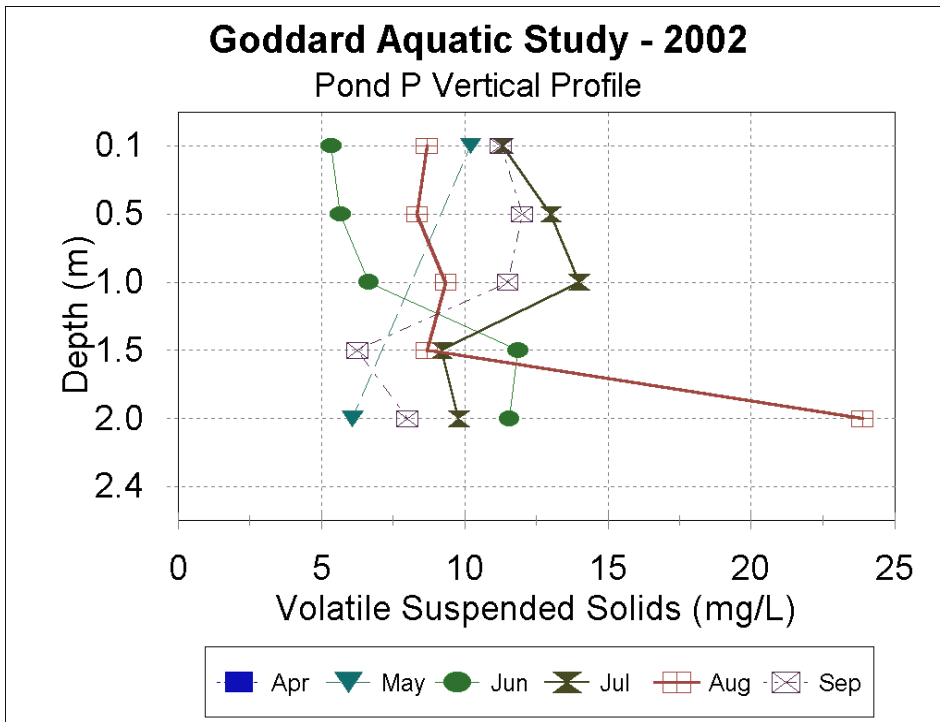


Figure 61. Volatile Suspended Solids (mg/L) Vertical Profile in Pond P by Sampling Date.

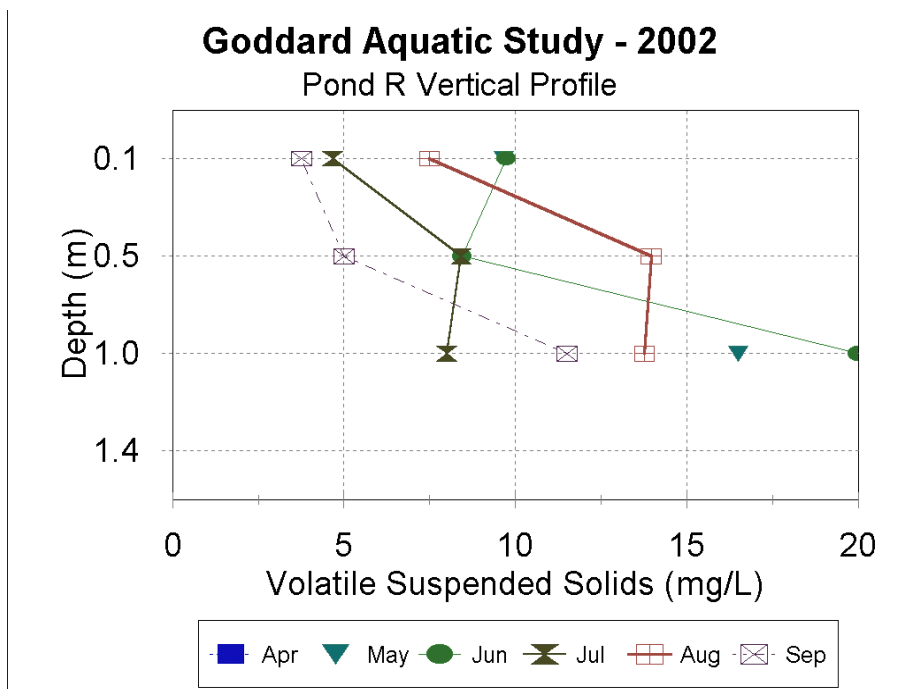


Figure 62. Volatile Suspended Solids (mg/L) Vertical Profile in Pond R by Sampling Date.

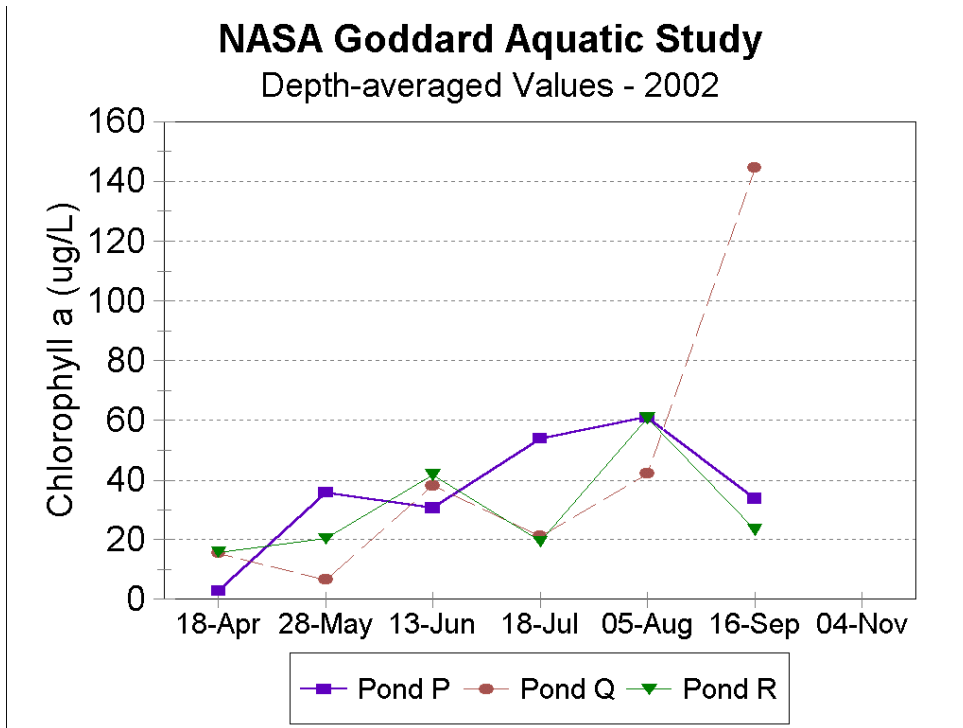


Figure 63. Average Chlorophyll a (ug/L) by Sampling Date.

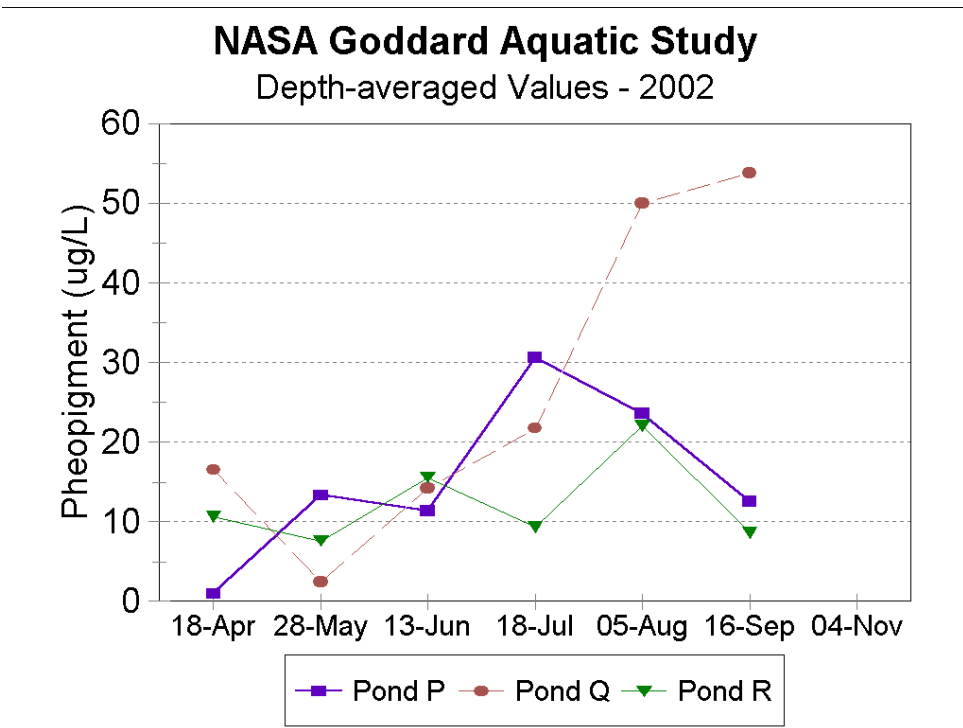


Figure 64. Average Pheopigment (ug/L) by Sampling Date.

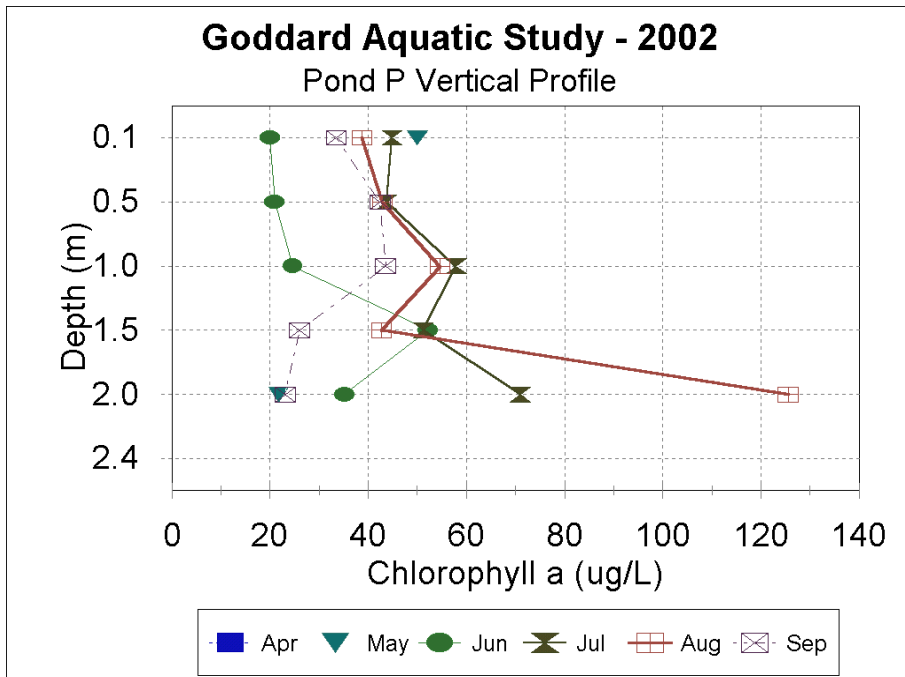


Figure 65. Chlorophyll a (ug/L) Vertical Profile in Pond P by Sampling Date.

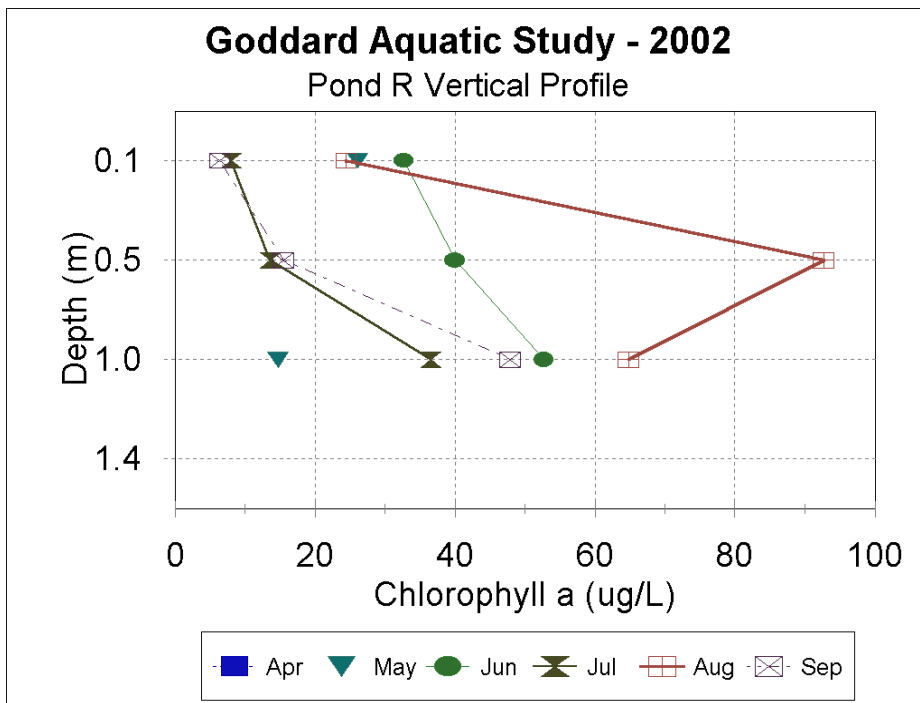


Figure 66. Chlorophyll a (ug/L) Vertical Profile in Pond R by Sampling Date.

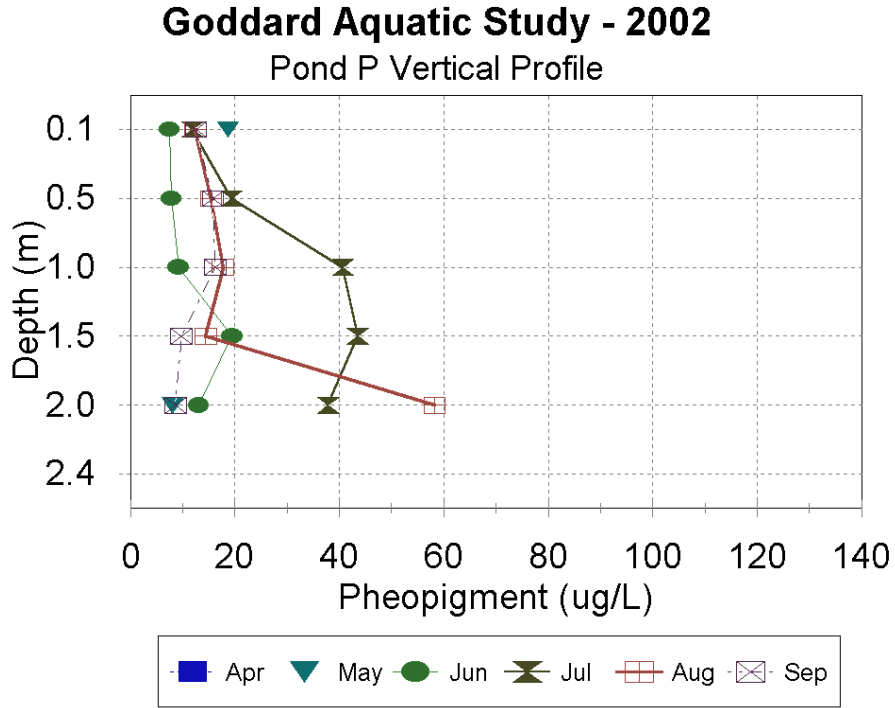


Figure 67. Pheopigment (ug/L) Vertical Profile in Pond P by Sampling Date.

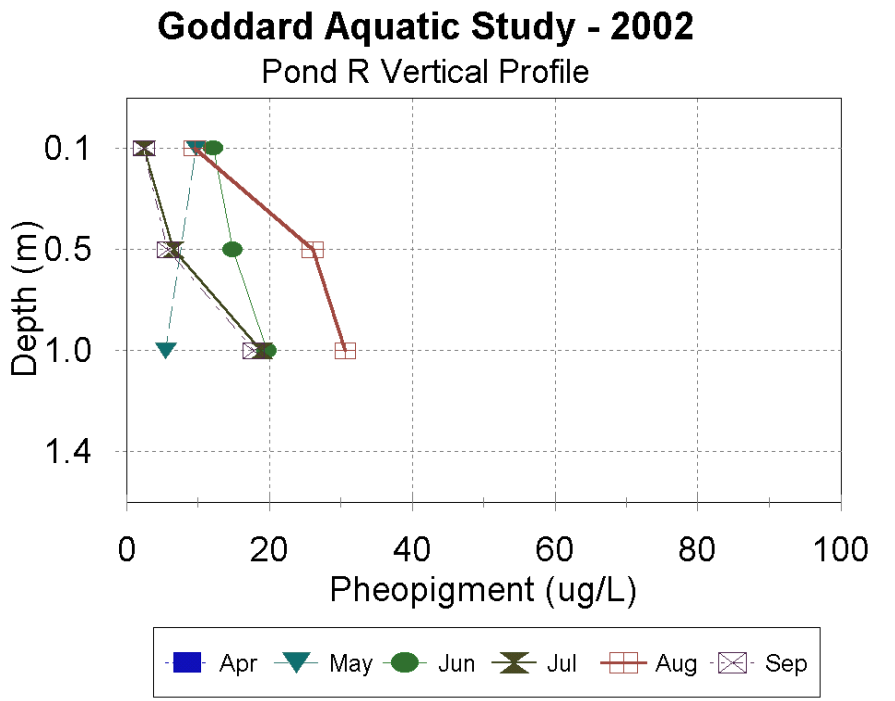


Figure 68. Pheopigment (ug/L) Vertical Profile in Pond R by Sampling Date.

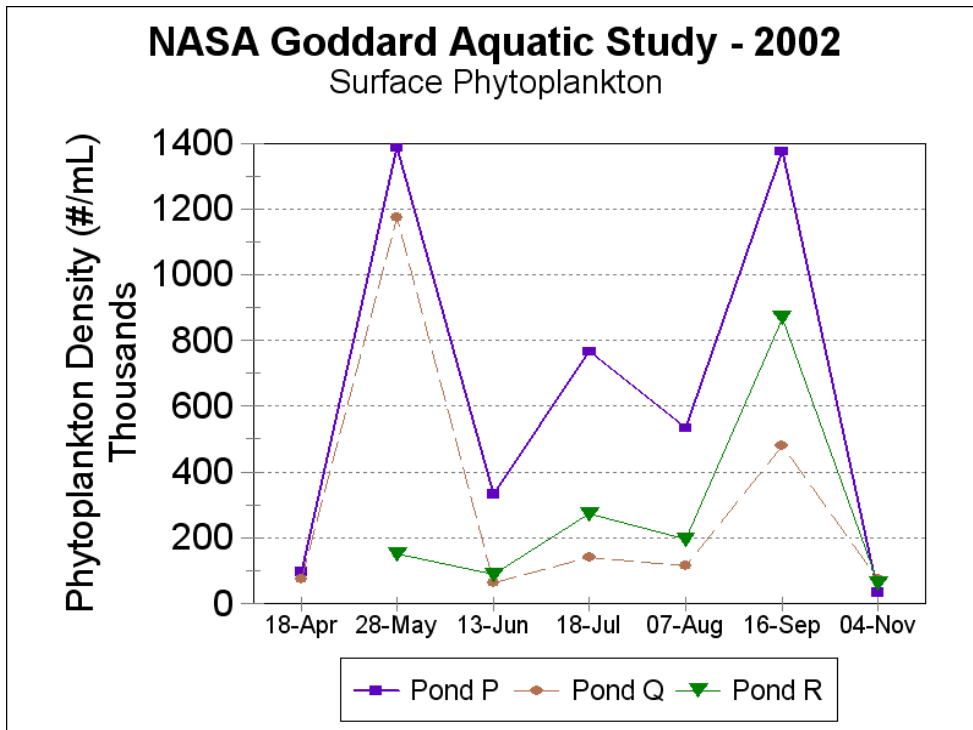


Figure 69. Total Phytoplankton Density (#/mL) Near Surface Values by Sampling Date.

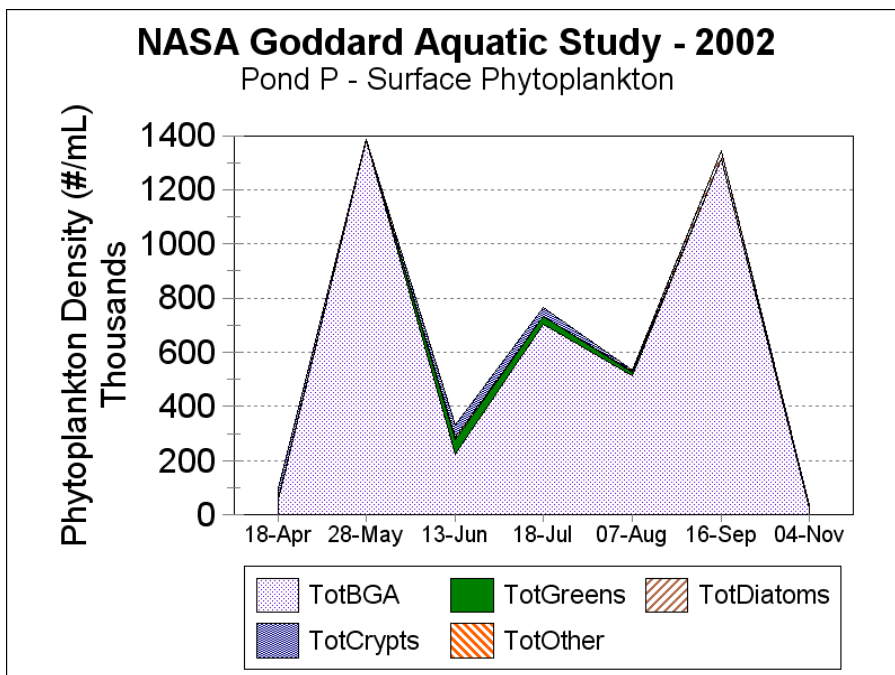


Figure 70. Phytoplankton Density (#/mL) Near Surface Values in Pond P by Major Group on Each Sampling Date.

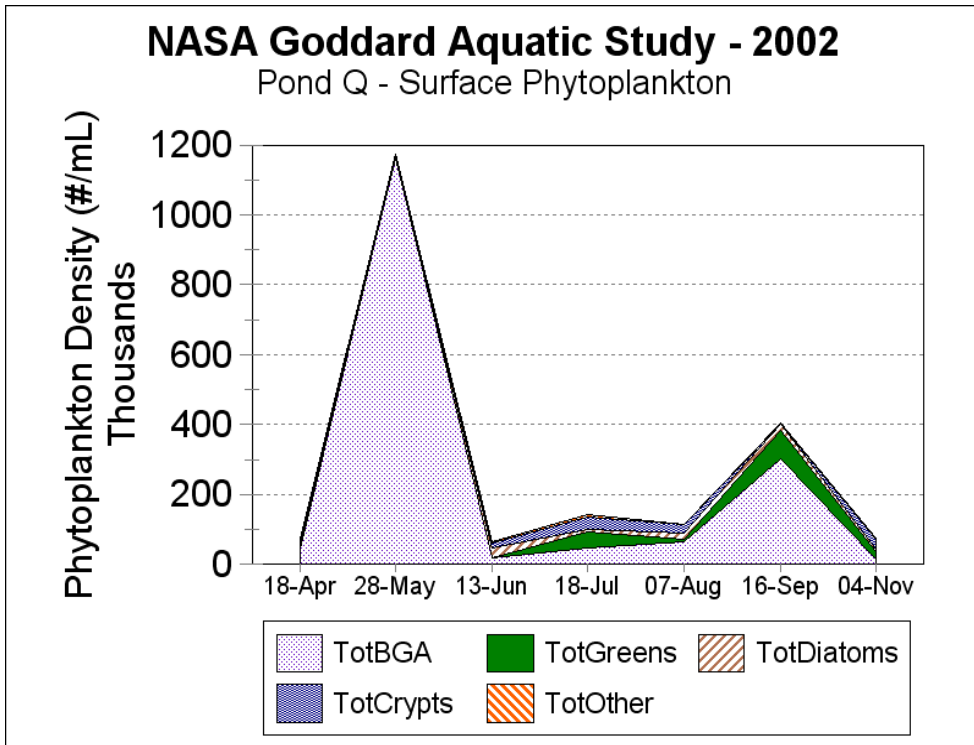


Figure 71. Phytoplankton Density (#/mL) Near Surface Values in Pond Q by Major Group on Each Sampling Date.

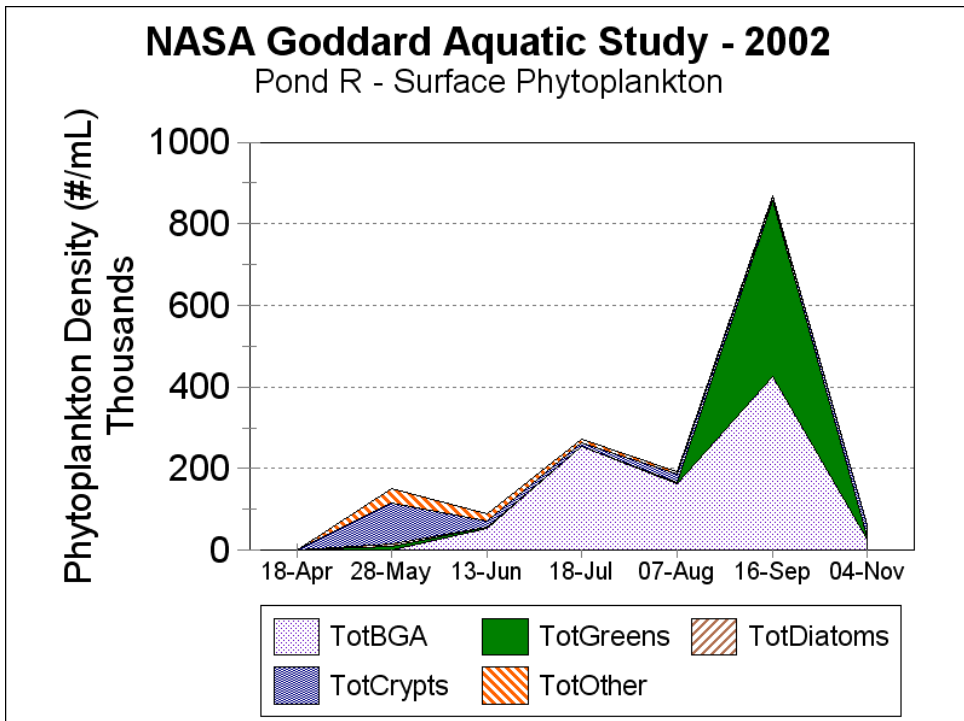


Figure 72. Phytoplankton Density (#/mL) Near Surface Values in Pond R by Major Group on Each Sampling Date.

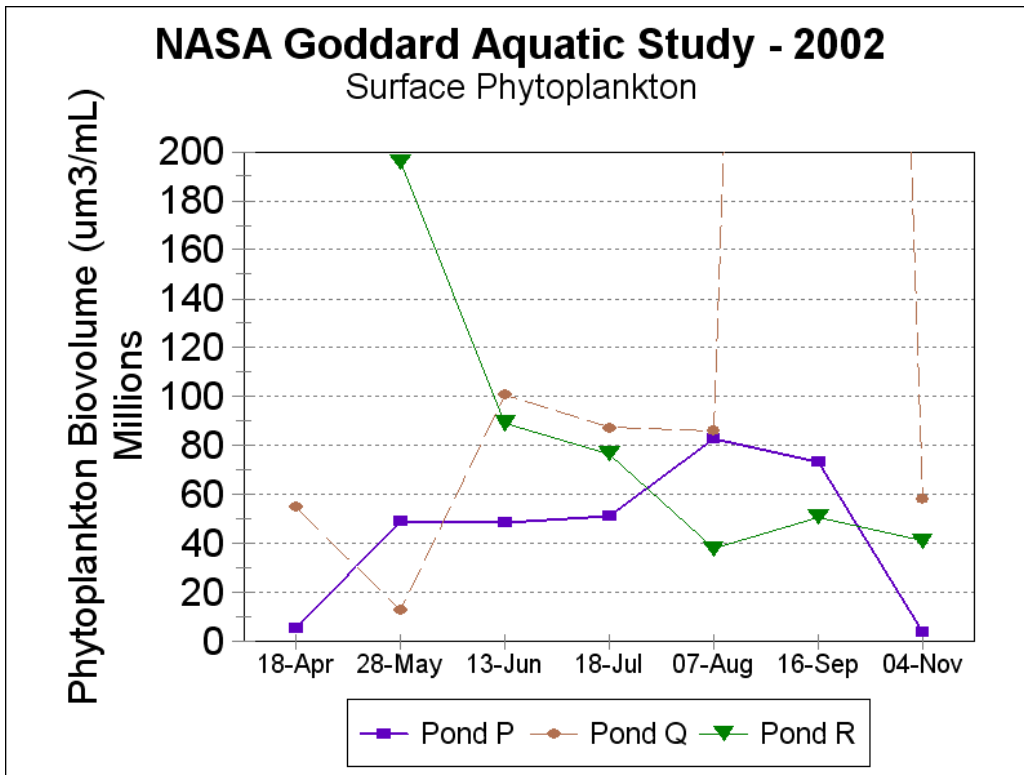


Figure 73. Total Phytoplankton Biovolume (um³/mL)

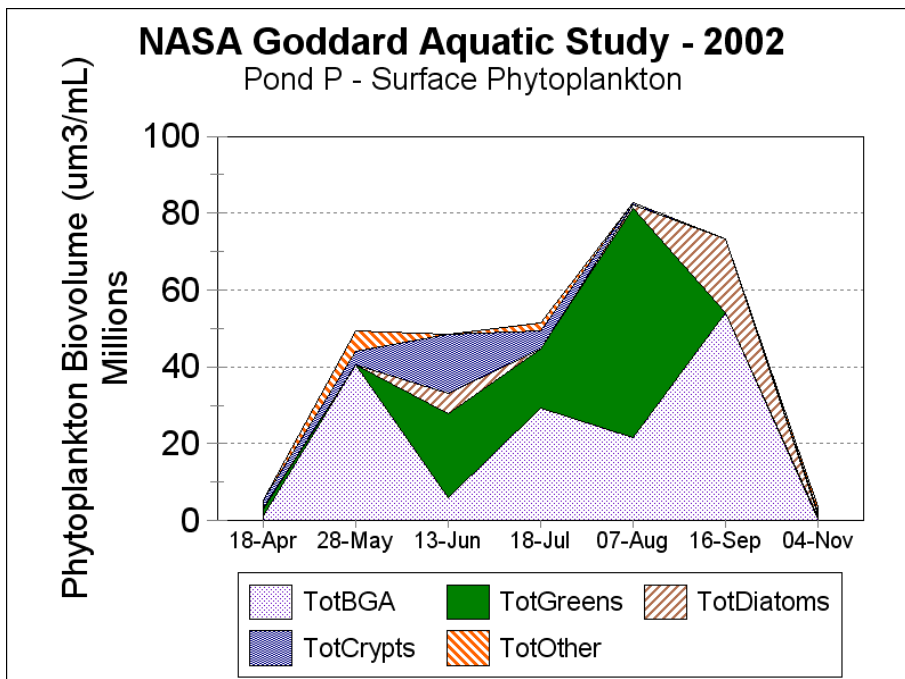


Figure 74. Phytoplankton Biovolume (um³/mL) Near surface Values in Pond P by Major Group on Each Sampling Date.

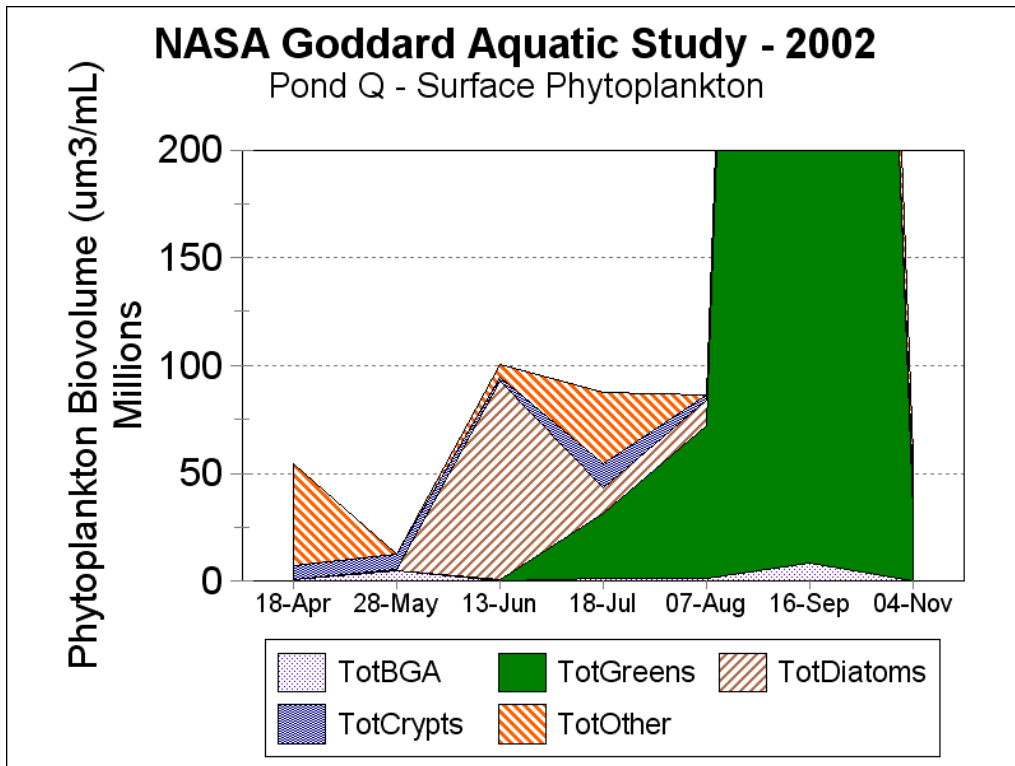


Figure 75. Phytoplankton Biovolume ($\mu\text{m}^3/\text{mL}$) Near surface Values in Pond Q by Major Group on Each Sampling Date.

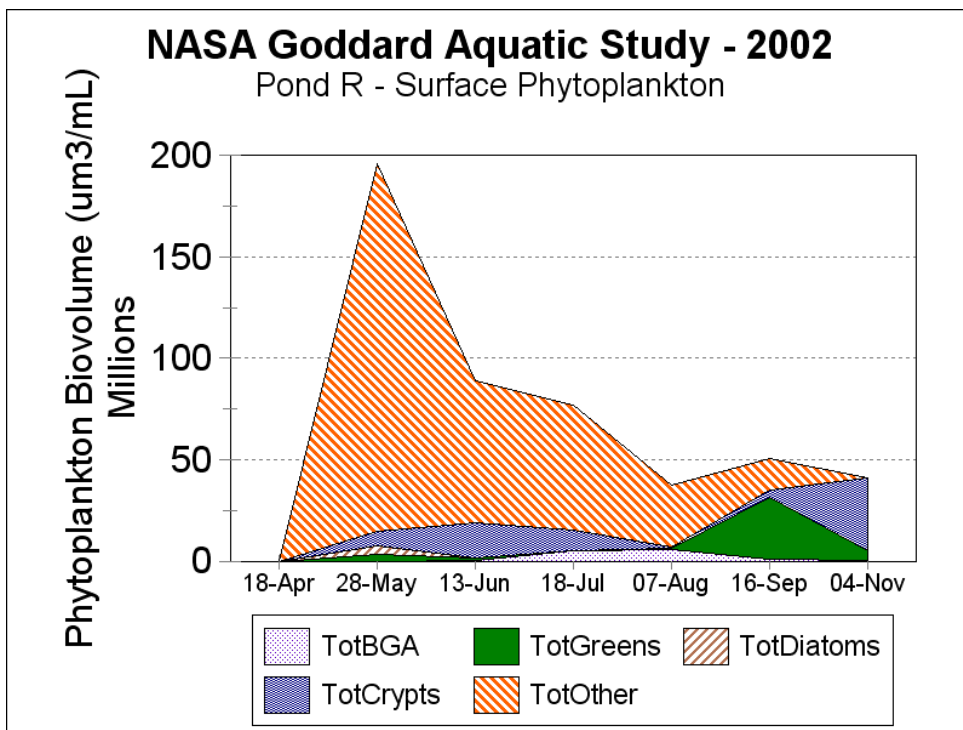


Figure 76. Phytoplankton Biovolume ($\mu\text{m}^3/\text{mL}$) Near surface Values in Pond R by Major Group on Each Sampling Date.

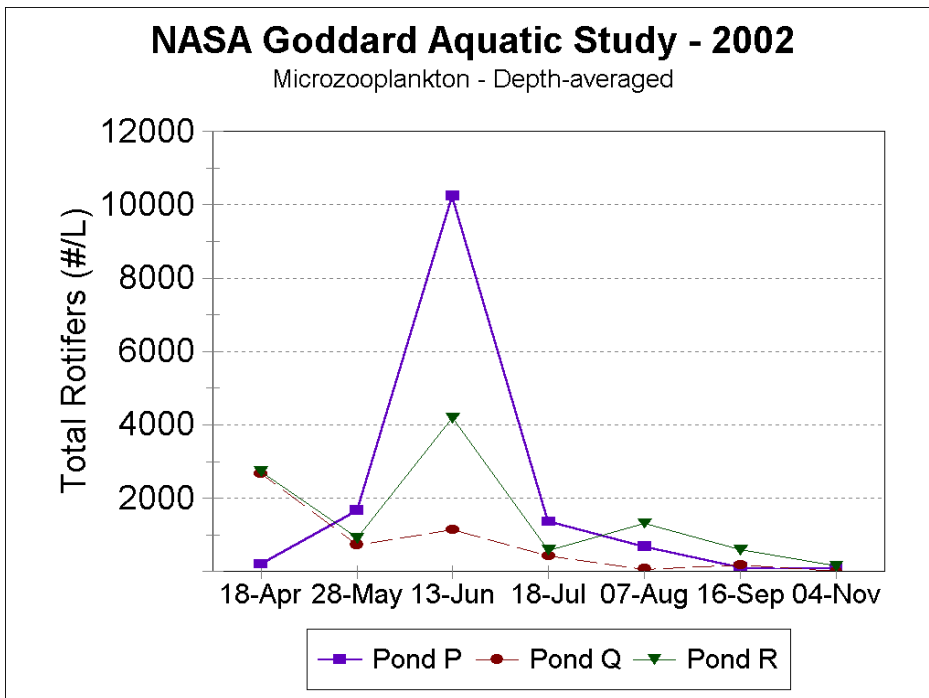


Figure 77. Total Rotifers (#/L) Depth-integrated Values by Sampling Date.

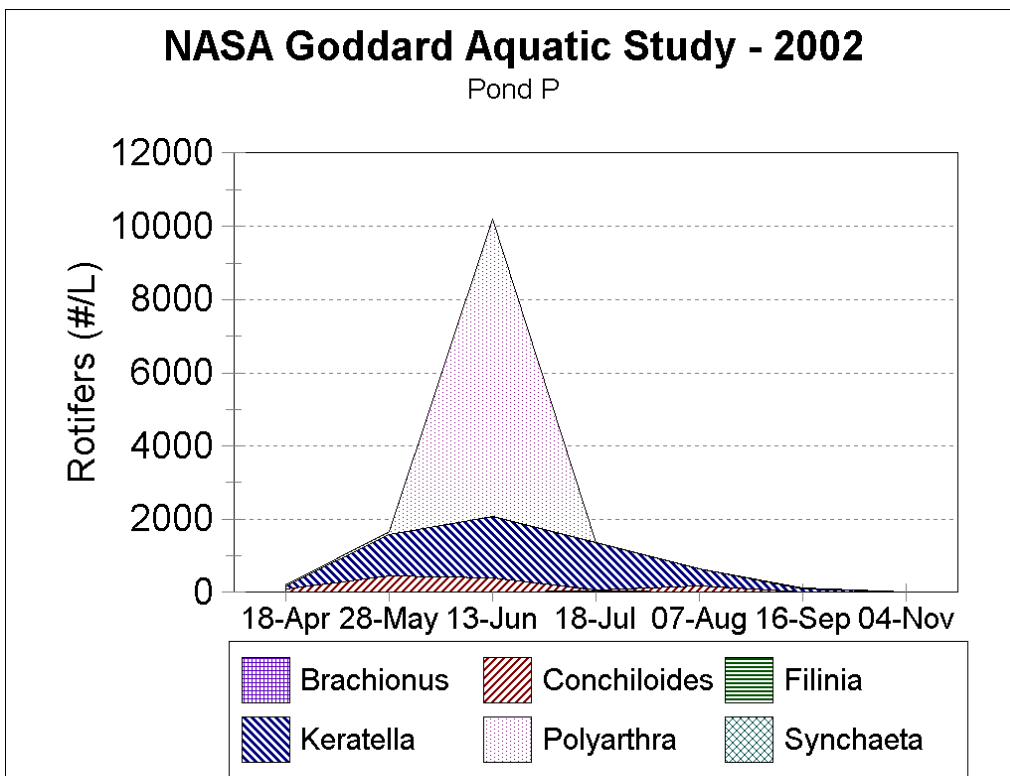


Figure 78. Rotifers (#/L) Depth-integrated Values by Genus in Pond P on Each Sampling Date.

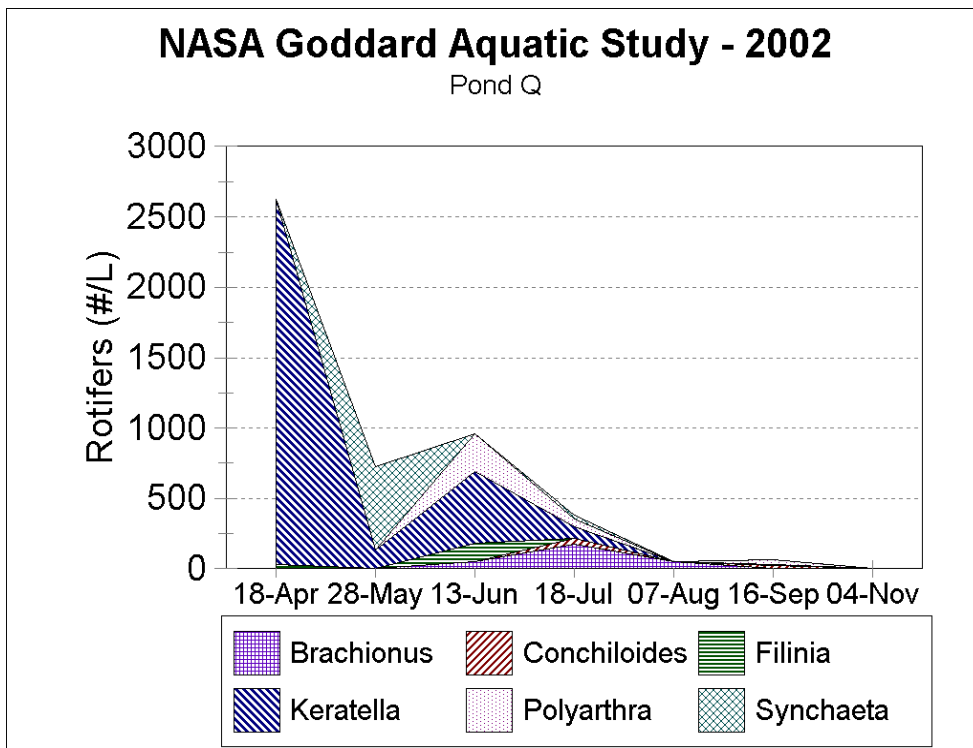


Figure 79. Rotifers (#/L) Depth-integrated Values by Genus in Pond Q on Each Sampling Date.

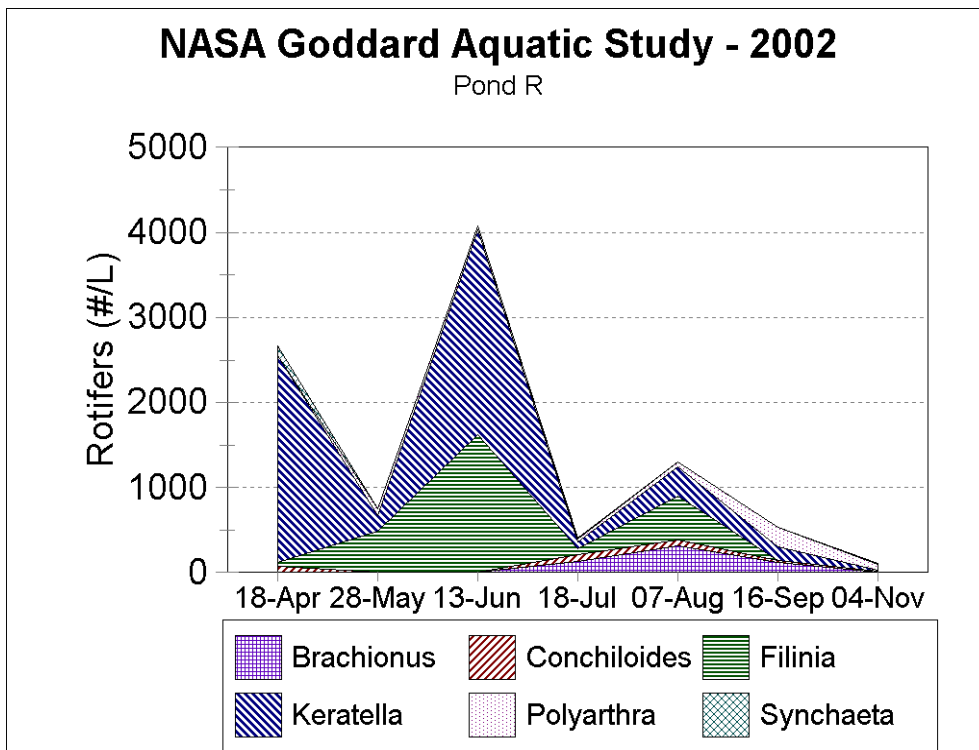


Figure 80. Rotifers (#/L) Depth-integrated Values by Genus in Pond R on Each Sampling Date.

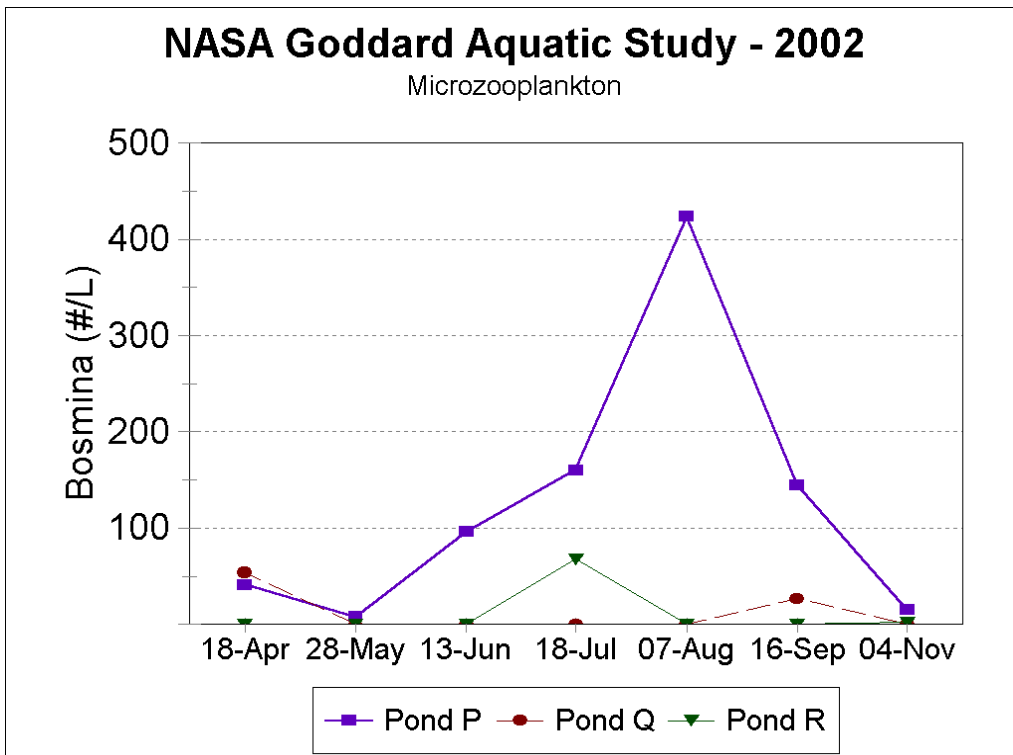


Figure 81. *Bosmina* (#/L) Depth-integrated Values by Sampling Date.

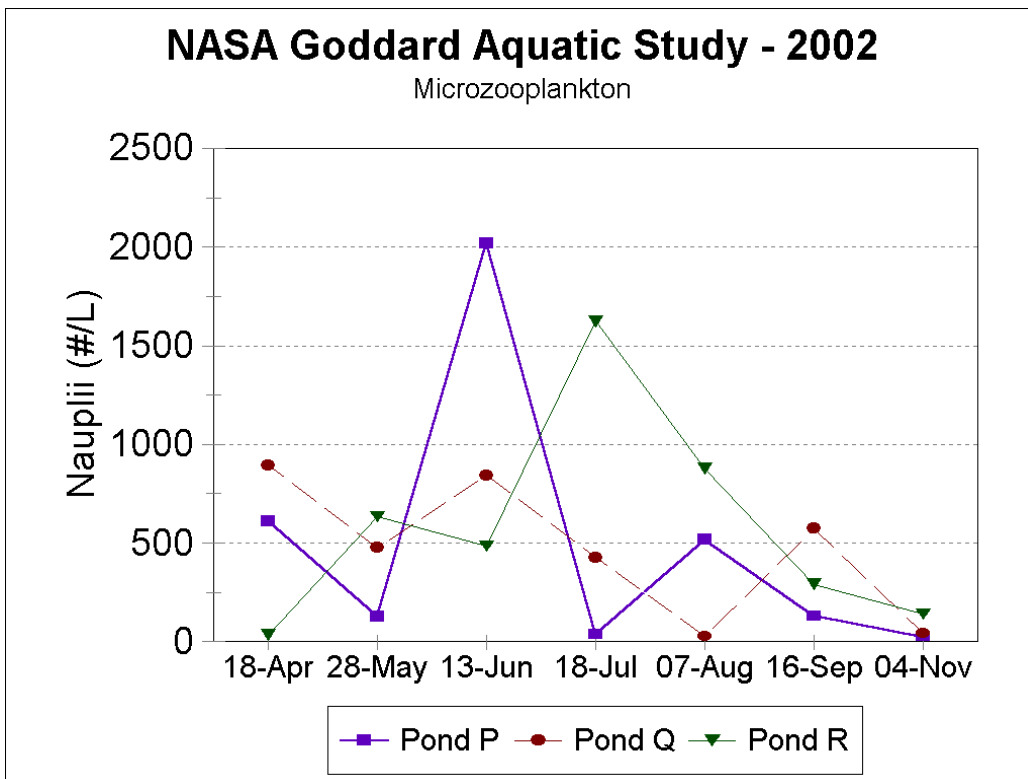


Figure 82. *Nauplii* (#/L) Depth-integrated Values by Sampling Date.

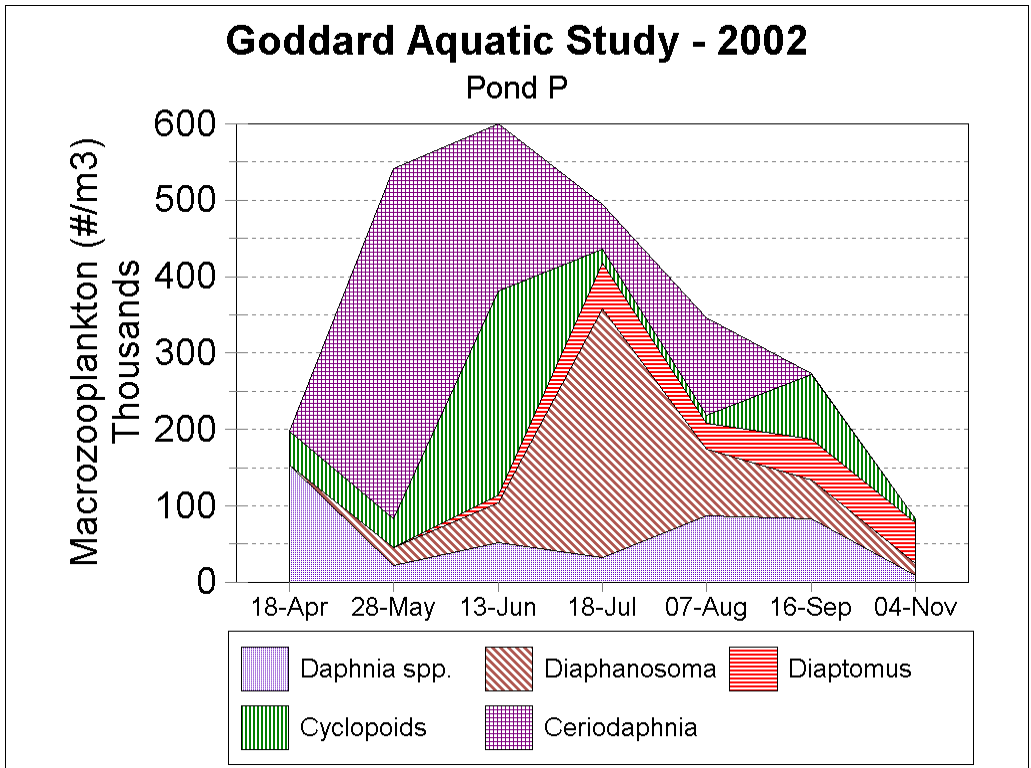


Figure 83. Macrozooplankton ($\#/m^3$) Depth-integrated Values in Pond P by Genus on Each Sampling Date.

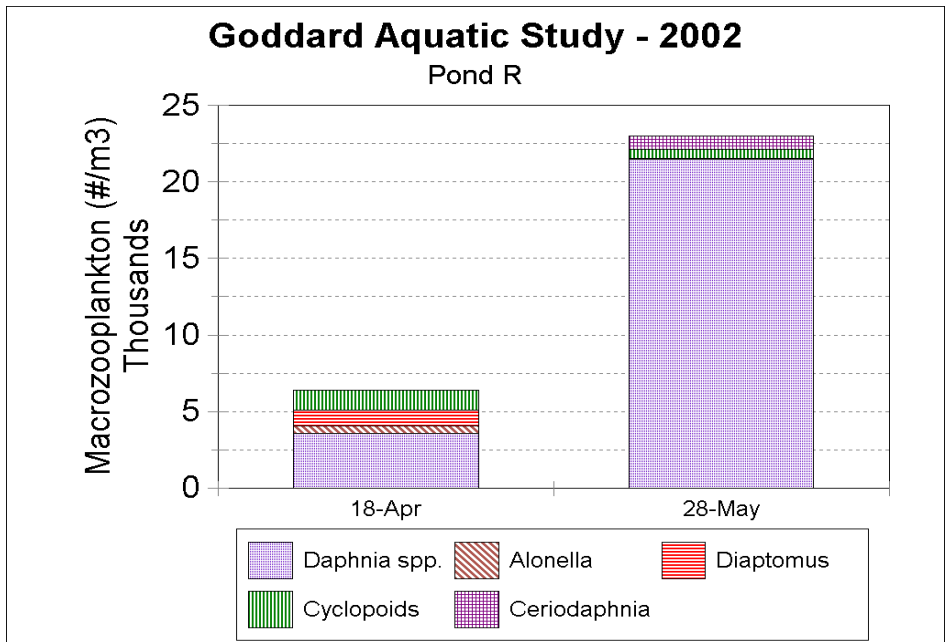


Figure 84. Macrozooplankton ($\#/m^3$). Surface Values in Pond R by Genus on Each Sampling Date.