

Biomass and Vegetative Characteristics of Sawgrass Grown in a Tilting Flume as Part of a Study of Vegetative Resistance to Flow

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BIOMASS AND VEGETATIVE CHARACTERISTICS OF SAWGRASS GROWN IN A TILTING FLUME AS PART OF A STUDY OF VEGETATIVE RESISTANCE TO FLOW

by

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ABSTRACT

The U.S. Geological Survey is studying vegetative resistance to flow in the south Florida Everglades as part of a multidisciplinary effort to restore the South Florida Ecosystem. In order to test the flow resistance of sawgrass, one of the dominant species in the Everglades, uniform, dense stands of sawgrass were grown in a tilting flume at Stennis Space Center, Mississippi. Depth of water in the flume was controlled by adding or removing metal plates at the downstream end of the flume. A series of experiments were conducted at various flow depths, and the velocity, flow depth, and water-surface slope were measured. During each set of experiments, the sawgrass was sampled in layers from the sediment water interface for vegetative characteristics, biomass, and leaf area index. The results of the vegetation sampling are summarized in a series of tables.

INTRODUCTION

As part of the South Florida Ecosystem Study, "Determination of Vegetative Resistance to Flow," uniform, dense stands of sawgrass were grown in pans that were fit tightly into a tilting flume at Stennis Space Center, Mississippi, to form a 61 m long, 1.8 m wide artificial sawgrass ecosystem (Lee and Carter, 1996). The depth of water in the flume is controlled by adding or removing metal plates at the downstream end. Several series of experiments were conducted at various flow depths between 0 and 90 cm, and vegetative resistance was calculated from velocity, flow depth, and surface-water slope.

During each experimental series, the vegetation in the flume was sampled to determine, as a function of distance from the bed or the sediment/water interface, the biomass per unit area, the number of live stems and leaves per unit area, leaf and stem width, and leaf area index. The general methods for measuring biomass and plant characteristics are outlined below. Measurements were made starting in September, 1995, when the plants were nine months old, and continued at intervals as each individual series of experiments were concluded.

This publication is the first of two planned Open-File reports summarizing the vegetation information by date and plant age. Following the series of experiments described here, part of the flume was converted to a wind tunnel, and several series of experiments were

conducted at different flow velocities, depths, and wind speeds. The results of the later set of experiments will be described in the second report.

STUDY METHODS

Quadrat Biomass

Measurement dates, type of measurement, and treatment of plants between measurements are summarized in Table 1. Biomass was measured in 37x55 cm quadrats; the number of quadrats varied by date. Leaves, culms, and dead material were cut and removed at 90, 60, 40, 20, and 0 cm from the sediment/water interface, starting at the top of the plants. The plant material from each layer was sorted (see plant description below) and dried at 105 °C for about 12 hours, weighed, and the weight expressed as grams dry weight per square meter (gdw/m²). This method, with variations in the number and positions of the quadrats, was used throughout the duration of the sawgrass experiments. For the first three sampling periods, all live leaves and culms were separated from dead standing leaves and culms and the remaining litter; thus, live biomass includes both leaves and culms, and dead biomass includes all dead material. In October, 1996, we began to separate live leaves from live culms and measure their biomass separately. The dead standing leaves and culms were still combined with the dead litter. By March, 1997, dead upright leaves and culms were present when we did the sampling, and the biomass measurements were further refined to include them. In March and June of 1997, we separated all components, live leaves, live culms, dead standing leaves, dead standing culms, and dead litter, and measured their biomass separately. Biomass data for individual quadrats were averaged to give biomass data for the flume for each date.

It was necessary to trim the tops of the sawgrass back to 1 meter total height frequently to permit the measuring cart to move across the top of the flume. For this reason, the >90 cm layer was not measured after September, 1995, until June, 1997, when the tops of the plants were allowed to grow for wind simulation experiments. Visually, the plants were generally healthy and green with strongly stiff and upright leaves (the tips having been cut off). Some mortality occurred as time went on, and new plants also sprouted. During some periods between sampling, plants were thinned out or transplanted to fill gaps. The amount of litter in the bottom increased naturally, but was far less than we observed in the field. For this reason, we added to the bottom litter by throwing the cut-off tops of the plants into the flume in order to more closely simulate natural field conditions.

Plant Descriptions

All leaves and culms in each layer were counted and dried. Leaves were separated into small, medium, and large classes, and six widths were measured for each size class, when possible. Likewise, culms were divided into small and large classes and six diameters were measured for each class. In October, 1996, March, 1997, and June, 1997, additional descriptive information was collected, including number of live culms, number of dead

standing culms, number of live leaves, number of dead standing leaves, and, in June, 1997, composition of the vegetation above 90 cm. Descriptive data were summarized for each date. Leaf Area Index (LAI) in m^2m^{-2} (square meters of leaf opposing flow per square meter of sediment surface) was calculated for each layer using the equation:

$$LAI = LL \times AW_{LL} + ML \times AW_{ML} + SL \times AW_{SL} + LC \times AW_{LC} + SC \times AW_{SC} \times DL,$$

where AW = average width in meters of live leaves or culms, LL = number of large live leaves only or live plus dead leaves per m^2 , ML = number of medium live leaves only or live plus dead leaves per m^2 , SL = number of small live leaves only or live plus dead leaves per m^2 , LC = number of large live culms or live culms plus dead culms per m^2 , SC = number of small live culms or live plus dead culms per m^2 , and DL is the depth of the layer in meters. Use of live versus live plus dead depended on date of sampling.

RESULTS OF DATA COLLECTION

Selected results of the flume sampling are summarized in Table 2. In general, the plants became larger and more robust as time went on; the culms extended into higher layers, the leaves became larger, and the number of leaves decreased. Table 3 summarizes the leaf area indices (LAI) for the six dates. Biomass and descriptive information for each date are summarized in Tables 4 through 9. Tables are numbered by date; thus Tables 4a through 4d are for September, 1995, and so forth. Figures 1 through 3 summarize the average live, dead, and total biomass in the flume respectively for the six sampling dates. Figure 4 shows the number of leaves, and Figure 5 shows the number of culms in the flume for the six sampling dates.

REFERENCE CITED

Lee, J. K. and Carter, Virginia, 1996, Vegetation affects water movement in the Florida Everglades: U.S. Geological Survey Fact Sheet FS-147-96, 2 p.

Table 1. Procedures used at each vegetation sampling date and treatment between and during sampling dates

| Dates/age of plants | Plant characteristics | Sampling design | Treatment between sampling dates/comments |
|-------------------------------|--|--|--|
| September, 1995 (9 months) | Biomass: live, dead, total Description Leaf area index | 8 quadrats 8 quadrats all layers | Samples taken at upstream and downstream end of flume |
| January, 1996 (13 months) | Biomass: live, dead, total Description Leaf area index | 16 quadrats 16 quadrats all layers | Top of plants in quadrats trimmed and thrown into flume Quadrats in 4 strips across flume |
| May, 1996 (17 months) | Biomass: live, dead, total Description Leaf area index | 12 quadrats 12 quadrats all layers | Plants thinned between this date and previous date. Plants transplanted to gaps Old plant material from trimming tops and thinning thrown into flume |
| October, 1996 (21 months) | Biomass: live leaves, live culms, dead, total Description Leaf area index | 12 quadrats 12 quadrats all layers | Plants transplanted to gaps Plants thinned between this date and previous date |
| March, 1997 (27 months) | Biomass: live leaves and culms, dead standing leaves and culms, dead litter, total Description Leaf area index | 12 quadrats 12 quadrats all layers | Sponges added before this date Plants transplanted to gaps |
| June, 1997 (30 months) | Biomass: live leaves and culms, dead standing leaves and culms, dead litter, total Description Leaf area index | 8 quadrats 8 quadrats all layers | Wind tunnel installed Front and back sections cleared Tops of plants not cut since March runs |

Table 2. Selected results of flume vegetation sampling for six plant ages chosen to illustrate change in plant structure over time

[Sg = sawgrass; mos = months; Av = average; standing includes both live and dead leaves or culms; biomass in grams dry weight per square meter (gdw/m²)]

| | 9 mos | 13 mos | 17 mos | 21 mos | 27 mos | 30 mos |
|------------------------------------|------------------|-----------------|-----------------|-----------------|---|---|
| Av total biomass | 588 | 795 | 727 | 532 | 731 | 813 |
| Class | Medium Sg | Medium Sg | Medium Sg | Medium Sg | Medium Sg | Medium Sg |
| Total number of leaves at 40-60 cm | 1183 (live only) | 562 (live only) | 325 (live only) | 228 (live only) | 344 (standing live and dead) 185 (live only) | 331 (standing live and dead) 179 (live only) |
| Total number of leaves at 20-40 cm | 1086 (live only) | 330 (live only) | 75 (live only) | 110 (live only) | 267 (standing live and dead) 103 (live only) | 213 (standing live and dead) 38 (live only) |
| Total number of culms at 0-20 cm | 225 (live only) | 115 (live only) | 75 (live only) | 48 (live only) | 54 (standing live and dead) 38 (live only) | 64 (standing live and dead) 50 (live only) |
| Total number of culms at 20-40 cm | 97 (live only) | 97 (live only) | 68 (live only) | 41 (live only) | 46 (standing live and dead) 37 (live only) | 47 (standing live and dead) 42 (live only) |
| Total dead biomass | 65 | 305 | 300 | 246 | 259 | 323 |

Table 3. Summary of uncorrected Leaf Area Indices (LAI) for six plant ages
[cm = centimeter; mos = months; LAI in m^2m^{-2} ; see text for formulas.]

| Age of plant ---- Layer | 9 mos | 13 mos | 17 mos | 21 mos | 27 mos | 30 mos |
|----------------------------|-------|--------|--------|--------|--------|--------|
| 60-90 cm | 1.258 | 1.195 | 0.775 | 0.488 | 0.771 | 0.862 |
| 40-60 cm | 0.941 | 0.694 | 0.456 | 0.333 | 0.560 | 0.653 |
| 20-40 cm | 0.929 | 0.545 | 0.261 | 0.237 | 0.577 | 0.545 |
| 0-20 cm | 0.593 | 0.460 | 0.222 | 0.191 | 0.577 | 0.336 |
| Total | 3.721 | 2.894 | 1.713 | 1.248 | 2.485 | 2.396 |

Table 4a. Sawgrass biomass in the flume, September, 1995

[Plants are nine months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter (gdw/m^2); dead includes all dead material.]

| Sample designation ---- Layer | Sample biomass | | | | | | | | | | | |
|----------------------------------|----------------|-------|--------|--------|-------|--------|--------|-------|--------|--------|-------|--------|
| | U22 | | | U23 | | | U16 | | | U15 | | |
| | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| >90 | 44.13 | | 44.13 | 47.43 | | 47.43 | 49.01 | | 49.01 | 63.36 | | 63.36 |
| 60-90 | 100.68 | | 100.68 | 103.76 | | 103.76 | 68.53 | | 68.53 | 95.66 | 3.37 | 99.03 |
| 40-60 | 93.93 | 5.24 | 99.17 | 113.24 | 13.20 | 126.44 | 85.54 | 4.16 | 89.70 | 104.91 | 5.24 | 110.15 |
| 20-40 | 123.21 | 3.95 | 127.16 | 111.73 | 18.16 | 129.89 | 126.94 | 3.30 | 130.24 | 110.08 | 11.48 | 121.56 |
| 0-20 | 159.31 | 43.77 | 203.08 | 152.06 | 42.84 | 194.90 | 123.00 | 35.09 | 158.09 | 146.82 | 22.75 | 169.57 |
| total | 521.26 | 52.96 | 574.22 | 528.23 | 74.20 | 602.43 | 453.02 | 42.55 | 495.57 | 520.83 | 42.84 | 563.67 |

| Sample designation ---- Layer | Sample biomass | | | | | | | | | | | |
|----------------------------------|----------------|-------|--------|--------|-------|--------|--------|-------|--------|--------|-------|--------|
| | D17 | | | D5 | | | D10 | | | D8 | | |
| | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| >90 | 26.91 | 1.15 | 28.06 | 51.31 | 1.87 | 53.17 | 32.94 | 5.67 | 38.61 | 50.88 | 4.23 | 55.11 |
| 60-90 | 69.54 | 3.44 | 72.98 | 140.94 | 3.37 | 144.31 | 80.37 | 2.37 | 82.74 | 93.00 | 8.47 | 101.47 |
| 40-60 | 100.39 | 9.19 | 109.58 | 132.11 | 7.68 | 139.79 | 81.95 | 12.49 | 94.44 | 93.29 | 5.53 | 98.81 |
| 20-40 | 138.86 | 28.63 | 167.49 | 158.02 | 17.65 | 175.67 | 109.22 | 29.13 | 138.35 | 131.82 | 12.99 | 144.81 |
| 0-20 | 159.67 | 51.45 | 211.12 | 217.94 | 47.15 | 265.08 | 122.49 | 30.14 | 152.63 | 170.57 | 25.47 | 196.05 |
| total | 495.36 | 93.86 | 589.22 | 700.31 | 77.72 | 778.02 | 426.97 | 79.80 | 506.77 | 539.56 | 56.69 | 596.25 |

Table 4b. Summary of sawgrass biomass in the flume, September, 1995

[Plants are nine months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter; SD = standard deviation; N = number of samples; dead includes all dead material.]

| Layer | Average live biomass | SD | N | Average dead biomass | SD | Average total biomass | SD |
|-------|----------------------|-------|---|----------------------|--------|-----------------------|-------|
| >90 | 45.75 | 11.36 | 8 | 1.61 | 26.88 | 47.36 | 10.77 |
| 60-90 | 94.06 | 23.64 | 8 | 2.63 | 55.79 | 96.69 | 23.64 |
| 40-60 | 100.67 | 17.06 | 8 | 7.84 | 55.03 | 108.51 | 17.06 |
| 20-40 | 126.23 | 19.74 | 8 | 15.66 | 75.03 | 141.90 | 19.74 |
| 0-20 | 156.48 | 35.92 | 8 | 37.33 | 88.30 | 193.81 | 35.92 |
| total | 523.19 | 86.44 | 8 | 65.08 | 295.14 | 588.27 | 86.44 |

Table 4c. Descriptive information on flume vegetation, September, 1995

[Plants are nine months old; layer in centimeters above the sediment/water interface; average width in millimeters.]

| Layer | Large leaves | | Medium leaves | | Small leaves | | Large culms | | Small culms | |
|-------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|--------------------------------|---------------|--------------------------------|---------------|
| | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # culms/m ² | Average width | Average # culms/m ² | Average width |
| >90 | 36.8 | 7.5 | 262.8 | 4.7 | 197.3 | 2.3 | | | | |
| 60-90 | 32.3 | 7.2 | 600.1 | 5.2 | 356.1 | 2.3 | | | | |
| 40-60 | 9.9 | 7.1 | 781.3 | 4.7 | 392.0 | 2.4 | | | | |
| 20-40 | 9.0 | 7.6 | 630.6 | 4.8 | 446.7 | 2.4 | 38.6 | 7.3 | 58.3 | 4.3 |
| 0-20 | 19.7 | 9.4 | 164.2 | 5.5 | 83.4 | 3.2 | 121.1 | 9.7 | 104.1 | 4.2 |

Table 4d. Summary of leaves and culms in the flume, September, 1995

[Plants are nine months old; layer in centimeters above the sediment/water interface: SD = standard deviation; N = number of samples.]

| Layer | Total # leaves/m ² | SD | N | Total # culms/m ² | SD |
|-------|-------------------------------|--------|---|------------------------------|-------|
| > 90 | 496.9 | 144.33 | 8 | | |
| 60-90 | 988.5 | 273.45 | 8 | | |
| 40-60 | 1183.1 | 273.45 | 8 | | |
| 20-40 | 1086.3 | 225.66 | 8 | 96.9 | 32.32 |
| 0-20 | 267.3 | 82.78 | 8 | 225.2 | 44.56 |

Table 4e. Leaf area index by layer for the flume, September, 1995

[Leaf area index is calculated for live leaves and culms only; layer in centimeters above the sediment-water interface; see text for formulas.]

| Layer | Leaf Area Index | Corrected Leaf Area Index |
|-------|-----------------|---------------------------|
| 60-90 | 1.258 | 1.293 |
| 40-60 | 0.941 | 1.014 |
| 20-40 | 0.929 | 1.044 |
| 0-20 | 0.593 | 0.735 |
| Total | 3.721 | 4.086 |

Table 5a. Sawgrass biomass in the flume, January, 1996

[Plants are 13 months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter; dead includes all dead material.]

| Sample biomass | | | | | | | | | | | | |
|-------------------------|--------|--------|----------|--------|--------|----------|--------|--------|--------|--------|--------|--------|
| Sample designation ---- | 10E1 | | | 10E2 | | | 10E3 | | | 10E4 | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 157.58 | 19.02 | 176.60 | 110.94 | 28.85 | 139.79 | 162.18 | 32.51 | 194.68 | 130.10 | 14.57 | 144.67 |
| 40-60 | 145.31 | 54.54 | 199.85 | 96.01 | 34.66 | 130.67 | 162.75 | 69.32 | 232.07 | 123.14 | 55.97 | 179.11 |
| 20-40 | 162.03 | 52.82 | 214.85 | 101.47 | 67.17 | 168.64 | 146.53 | 59.63 | 206.17 | 104.98 | 47.15 | 152.13 |
| 0-20 | 167.92 | 144.60 | 312.51 | 97.95 | 192.60 | 290.56 | 135.91 | 146.82 | 282.73 | 136.56 | 152.63 | 289.19 |
| total | 632.85 | 270.97 | 903.82 | 406.38 | 323.28 | 729.66 | 607.38 | 308.28 | 915.66 | 494.79 | 270.32 | 765.11 |
| Sample designation ---- | 20E1 | | | 20E2 | | | 20E3 | | | 20E4 | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 91.42 | 13.99 | 105.42 | 218.15 | 34.37 | 252.52 | 109.51 | 21.46 | 130.96 | 150.48 | 60.42 | 210.90 |
| 40-60 | 78.72 | 42.84 | 121.56 | 194.18 | 55.90 | 250.08 | 91.42 | 58.63 | 150.05 | 109.08 | 89.77 | 198.85 |
| 20-40 | 98.74 | 64.30 | 163.04 | 152.20 | 61.00 | 213.20 | 111.44 | 90.85 | 202.29 | 131.39 | 81.88 | 213.27 |
| 0-20 | 100.46 | 115.68 | 216.14 | 228.48 | 127.16 | 355.64 | 145.96 | 162.18 | 308.14 | 108.14 | 122.14 | 230.28 |
| total | 369.35 | 236.81 | 606.16 | 793.02 | 278.43 | 1,071.45 | 458.33 | 333.11 | 791.44 | 499.09 | 354.21 | 853.30 |
| Sample designation ---- | 30E1 | | | 30E2 | | | 30E3 | | | 30E4 | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 187.80 | 41.69 | 229.49 | 111.59 | 20.31 | 131.89 | 63.29 | 13.85 | 77.14 | 109.79 | 47.36 | 157.15 |
| 40-60 | 179.40 | 103.62 | 283.02 | 99.39 | 38.61 | 137.99 | 52.53 | 21.38 | 73.91 | 79.94 | 43.99 | 123.93 |
| 20-40 | 130.82 | 58.99 | 189.81 | 102.40 | 45.64 | 148.04 | 62.00 | 52.96 | 114.96 | 94.44 | 77.07 | 171.51 |
| 0-20 | 215.06 | 196.91 | 411.97 | 148.76 | 144.02 | 292.78 | 71.98 | 161.96 | 233.94 | 135.48 | 211.19 | 346.67 |
| total | 713.08 | 401.21 | 1,114.29 | 462.13 | 248.58 | 710.71 | 249.80 | 250.16 | 499.95 | 419.65 | 379.61 | 799.26 |
| Sample designation ---- | 40E1 | | | 40E2 | | | 40E3 | | | 40E4 | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 120.20 | 27.84 | 148.04 | 122.35 | 62.93 | 185.28 | 65.95 | 29.42 | 95.37 | 133.11 | 18.44 | 151.56 |
| 40-60 | 118.26 | 46.72 | 164.98 | 112.66 | 75.92 | 188.59 | 60.13 | 37.03 | 97.16 | 124.14 | 29.71 | 153.85 |
| 20-40 | 95.80 | 63.01 | 158.80 | 117.83 | 97.59 | 215.42 | 57.84 | 60.92 | 118.76 | 136.99 | 47.07 | 184.06 |
| 0-20 | 109.36 | 202.36 | 311.73 | 153.28 | 157.80 | 311.08 | 50.09 | 158.95 | 209.04 | 151.70 | 112.38 | 264.08 |
| total | 443.62 | 339.93 | 783.55 | 506.12 | 394.25 | 900.37 | 234.01 | 286.32 | 520.33 | 545.95 | 207.60 | 753.55 |

Table 5b. Summary of sawgrass biomass in the flume, January, 1996

[Plants are 13 months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter; SD = standard deviation, N = number of samples; dead includes all dead material.]

| Layer | Average live biomass | SD | N | Average dead biomass | SD | Average total biomass | SD |
|-------|----------------------|--------|----|----------------------|-------|-----------------------|--------|
| 60-90 | 127.78 | 40.81 | 16 | 30.44 | 15.61 | 158.22 | 48.01 |
| 40-60 | 114.19 | 40.35 | 16 | 53.66 | 22.08 | 167.86 | 56.20 |
| 20-40 | 112.93 | 29.57 | 16 | 64.25 | 15.42 | 177.18 | 33.23 |
| 0-20 | 134.82 | 46.39 | 16 | 156.84 | 30.72 | 291.66 | 53.89 |
| total | 489.72 | 148.98 | 16 | 305.19 | 58.49 | 794.91 | 169.62 |

Table 5c. Descriptive information on flume vegetation, January, 1996

[Plants are 13 months old; layer in centimeters above the sediment/water interface; average width in millimeters.]

| Layer | Large leaves | | Medium leaves | | Small leaves | | Large culms | | Small culms | |
|-------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|--------------------------------|---------------|--------------------------------|---------------|
| | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # culms/m ² | Average width | Average # culms/m ² | Average width |
| 60-90 | 87.0 | 8.5 | 343.1 | 6.3 | 293.8 | 3.5 | | | 8.5 | 4.2 |
| 40-60 | 61.4 | 9.0 | 285.7 | 6.0 | 214.8 | 3.8 | 13.5 | 10.2 | 50.7 | 5.1 |
| 20-40 | 52.0 | 9.2 | 131.0 | 6.4 | 147.1 | 4.0 | 36.3 | 11.9 | 61.0 | 6.4 |
| 0-20 | 49.3 | 10.6 | 59.7 | 7.0 | 34.5 | 3.5 | 55.2 | 14.0 | 59.7 | 7.8 |

Table 5d. Summary of leaves and culms in the flume, January, 1996

[Plants are 13 months old; layer in centimeters above the sediment/water interface; SD = standard deviation; N = number of samples.]

| Layer | Total leaves/m ² | SD | N | Total culms/m ² | SD |
|-------|-----------------------------|--------|----|----------------------------|-------|
| 60-90 | 723.9 | 214.96 | 16 | 8.5 | 11.18 |
| 40-60 | 562.0 | 181.93 | 16 | 64.1 | 27.2 |
| 20-40 | 330.1 | 129.04 | 16 | 97.3 | 28.34 |
| 0-20 | 143.5 | 83.15 | 16 | 114.8 | 32.52 |

Table 5e. Leaf area index by layer for the flume, January, 1996

[Leaf area index is calculated for live leaves and culms only; layer in centimeters above the sediment-water interface; see text for formulas.]

| Layer | Leaf Area Index | Corrected Leaf Area Index |
|-------|-----------------|---------------------------|
| 60-90 | 1.195 | 1.480 |
| 40-60 | 0.694 | 1.020 |
| 20-40 | 0.545 | 0.856 |
| 0-20 | 0.460 | 0.994 |
| Total | 2.894 | 4.349 |

Table 6a. Sawgrass biomass in the flume, May, 1996

[Plants are 17 months old; layer in centimeters from sediment/water interface; sample biomass in grams dry weight per square meter; dead includes all dead material.]

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Layer | 1A | | Total | 1B | | Total | 1C | |
| | Live | Dead | | Live | Dead | | Live | Dead | |
| 60-90 | 99.75 | 12.77 | 112.52 | 43.70 | 31.43 | 75.13 | 68.17 | 16.72 | 84.89 |
| 40-60 | 74.70 | 38.68 | 113.38 | 27.34 | 26.34 | 53.68 | 55.33 | 41.12 | 96.45 |
| 20-40 | 111.16 | 61.14 | 172.30 | 33.44 | 25.69 | 59.13 | 56.19 | 67.38 | 123.57 |
| 0-20 | 111.16 | 63.65 | 174.81 | 68.10 | 127.88 | 195.98 | 82.95 | 170.29 | 253.24 |
| Total | 396.76 | 176.24 | 573.00 | 172.58 | 211.33 | 383.92 | 262.64 | 295.51 | 558.15 |

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|---------|
| | Layer | 2A | | Total | 2B | | Total | 2C | |
| | Live | Dead | | Live | Dead | | Live | Dead | |
| 60-90 | 125.44 | 6.60 | 132.04 | 164.98 | 23.97 | 188.94 | 189.16 | 33.30 | 222.46 |
| 40-60 | 107.50 | 20.88 | 128.38 | 116.83 | 69.75 | 186.58 | 125.01 | 67.74 | 192.75 |
| 20-40 | 113.88 | 56.33 | 170.21 | 116.25 | 81.81 | 198.06 | 148.76 | 70.76 | 219.51 |
| 0-20 | 123.07 | 153.78 | 276.85 | 170.79 | 204.30 | 375.09 | 161.32 | 227.98 | 389.30 |
| Total | 469.88 | 237.60 | 707.48 | 568.84 | 379.83 | 948.67 | 624.24 | 399.77 | 1024.02 |

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Layer | 3A | | Total | 3B | | Total | 3C | |
| | Live | Dead | | Live | Dead | | Live | Dead | |
| 60-90 | 42.12 | 12.99 | 55.11 | 163.47 | 28.13 | 191.60 | 103.48 | 16.00 | 119.48 |
| 40-60 | 40.76 | 34.80 | 75.56 | 117.97 | 57.05 | 175.02 | 53.82 | 51.60 | 105.42 |
| 20-40 | 41.26 | 39.54 | 80.80 | 135.05 | 58.48 | 193.54 | 83.60 | 52.10 | 135.70 |
| 0-20 | 88.26 | 189.37 | 277.64 | 153.71 | 187.08 | 340.79 | 87.40 | 165.98 | 253.38 |
| Total | 212.41 | 276.71 | 489.12 | 570.20 | 330.74 | 900.95 | 328.30 | 285.68 | 613.98 |

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|--------|--------|--------|--------|---------|--------|--------|--------|
| | Layer | 4A | | Total | 4B | | Total | 4C | |
| | Live | Dead | | Live | Dead | | Live | Dead | |
| 60-90 | 200.28 | 29.78 | 230.06 | 189.09 | 122.78 | 311.87 | 51.52 | 7.75 | 59.27 |
| 40-60 | 129.60 | 59.20 | 188.80 | 146.75 | 41.48 | 188.23 | 41.41 | 26.41 | 67.81 |
| 20-40 | 139.36 | 51.45 | 190.81 | 165.48 | 40.40 | 205.88 | 59.20 | 162.90 | 222.10 |
| 0-20 | 150.77 | 156.37 | 307.13 | 179.11 | 148.04 | 327.15 | 60.28 | 159.52 | 219.80 |
| Total | 620.01 | 296.80 | 916.81 | 680.43 | 352.70 | 1033.13 | 212.41 | 356.58 | 568.99 |

Table 6b. Summary of sawgrass biomass in the flume, May, 1996

[Plants are 17 months old; layer in centimeters from the sediment/water interface; sample biomass in grams dry weight per square meter; SD = standard deviation; N = number of samples; dead includes all dead material.]

| Layer | Average live biomass | SD | N | Average dead biomass | SD | Average total biomass | SD |
|-------|----------------------|--------|----|----------------------|-------|-----------------------|--------|
| 60-90 | 120.10 | 60.22 | 12 | 28.52 | 31.09 | 148.61 | 80.24 |
| 40-60 | 86.42 | 41.70 | 12 | 44.59 | 16.42 | 131.00 | 52.80 |
| 20-40 | 100.30 | 44.47 | 12 | 64.00 | 34.61 | 164.30 | 53.45 |
| 0-20 | 119.74 | 42.27 | 12 | 162.85 | 41.27 | 282.60 | 67.92 |
| Total | 465.15 | 243.40 | 12 | 299.96 | 68.16 | 726.52 | 226.03 |

Table 6c. Descriptive information on flume vegetation, May, 1996

[Plants are 17 months old; layer in centimeters above the sediment/water interface; average width in millimeters.]

| Layer | Large leaves | | Medium leaves | | Small leaves | | Large culms | | Small culms | |
|---------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|--------------------------------|---------------|--------------------------------|---------------|
| | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # culms/m ² | Average width | Average # culms/m ² | Average width |
| 60 - 90 | 27.5 | 8.9 | 253.6 | 6.7 | 125.0 | 3.9 | | | 32.3 | 4.6 |
| 40 - 60 | 32.9 | 10.1 | 185.4 | 6.6 | 106.4 | 4.0 | 4.8 | 11.7 | 49.0 | 4.9 |
| 20 - 40 | 22.7 | 12.3 | 41.3 | 7.2 | 11.4 | 4.1 | 28.1 | 13.4 | 40.1 | 7.5 |
| 0 - 20 | 5.4 | 14.8 | 5.4 | 7.6 | 0.6 | 4.0 | 52.0 | 14.8 | 23.3 | 9.2 |

Table 6d. Summary of leaves and culms in the flume, May, 1996

[Plants are 17 months old; layer in centimeters above the sediment/water interface; SD = standard deviation; N = number of samples.]

| Layer | Total leaves/m ² | SD | N | Total culms/m ² | SD |
|---------|-----------------------------|--------|----|----------------------------|-------|
| 60 - 90 | 406.0 | 145.19 | 12 | 32.3 | 24.95 |
| 40 - 60 | 324.7 | 130.90 | 12 | 53.8 | 19.95 |
| 20 - 40 | 75.4 | 43.43 | 12 | 68.2 | 20.18 |
| 0 - 20 | 11.4 | 13.84 | 12 | 75.4 | 17.97 |

Table 6e. Leaf area index by layer for the flume, May, 1996

[Leaf area index is calculated for live leaves and culms only; layer in centimeters above the sediment-water interface; see text for formulas.]

| Layer | Leaf Area Index | Corrected Leaf Area Index |
|-------|-----------------|---------------------------|
| 60-90 | 0.775 | 0.959 |
| 40-60 | 0.456 | 0.692 |
| 20-40 | 0.261 | 0.427 |
| 0-20 | 0.222 | 0.523 |
| Total | 1.713 | 2.601 |

Table 7a. Sawgrass biomass in the flume, October, 1996

[Plants are 21 months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter; dead includes all dead material.]

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Layer | 1A | | | 1B | | | 1C | |
| | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 103.41 | 19.73 | 123.14 | 143.30 | 36.10 | 179.40 | 105.85 | 25.04 | 130.89 |
| 40-60 | 63.65 | 25.26 | 88.91 | 133.26 | 59.35 | 192.60 | 100.75 | 63.36 | 164.12 |
| 20-40 | 87.76 | 87.83 | 175.60 | 115.68 | 104.77 | 220.45 | 77.43 | 84.82 | 162.25 |
| 0-20 | 143.88 | 242.91 | 386.79 | 128.16 | 177.96 | 306.13 | 123.86 | 128.24 | 252.09 |
| Totals | 398.70 | 375.74 | 774.43 | 520.40 | 378.18 | 898.58 | 407.88 | 301.46 | 709.35 |

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|-------|--------|--------|--------|--------|-------|--------|--------|
| | Layer | 2A | | | 2B | | | 2C | |
| | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 43.34 | 5.09 | 48.44 | 93.22 | 43.85 | 137.06 | 24.18 | 8.68 | 32.87 |
| 40-60 | 40.19 | 7.61 | 47.79 | 93.50 | 72.33 | 165.84 | 25.40 | 22.96 | 48.37 |
| 20-40 | 31.07 | 30.57 | 61.64 | 79.37 | 78.58 | 157.94 | 16.50 | 42.19 | 58.70 |
| 0-20 | 29.85 | 44.63 | 74.49 | 97.74 | 72.41 | 170.14 | 17.94 | 137.56 | 155.50 |
| Totals | 144.45 | 87.91 | 232.36 | 363.82 | 267.16 | 630.99 | 84.03 | 211.40 | 295.44 |

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Layer | 3A | | | 3B | | | 3C | |
| | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 75.92 | 34.88 | 110.80 | 28.92 | 5.74 | 34.66 | 161.60 | 34.44 | 196.05 |
| 40-60 | 67.88 | 34.37 | 102.26 | 29.78 | 9.47 | 39.25 | 113.02 | 53.25 | 166.27 |
| 20-40 | 57.84 | 44.71 | 102.55 | 25.12 | 65.37 | 90.49 | 99.75 | 76.71 | 176.46 |
| 0-20 | 69.32 | 139.21 | 208.53 | 44.13 | 181.55 | 225.69 | 108.93 | 177.89 | 286.82 |
| Totals | 270.97 | 253.17 | 524.14 | 127.95 | 262.14 | 390.09 | 483.30 | 342.30 | 825.60 |

| Sample designation ---- | Sample biomass | | | | | | | | |
|-------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Layer | 4A | | | 4B | | | 4C | |
| | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 96.59 | 23.18 | 119.77 | 46.14 | 17.72 | 63.87 | 28.56 | 9.04 | 37.60 |
| 40-60 | 88.19 | 30.79 | 118.98 | 39.83 | 22.32 | 62.14 | 22.03 | 7.10 | 29.13 |
| 20-40 | 68.60 | 39.04 | 107.64 | 54.82 | 41.91 | 96.73 | 27.13 | 40.33 | 67.45 |
| 0-20 | 73.77 | 126.01 | 199.78 | 56.91 | 70.76 | 127.66 | 26.12 | 49.01 | 75.13 |
| Totals | 327.15 | 219.01 | 546.17 | 197.70 | 152.71 | 350.40 | 103.84 | 105.49 | 209.32 |

Table 7b. Summary of sawgrass biomass in the flume, October, 1996

[Plants are 21 months old; layer in centimeters above sediment/water interface; sample biomass in grams dry weight per square meter; SD = standard deviation; N = number of samples; dead includes all dead material.]

| Layer | Average live biomass | SD | N | Average dead biomass | SD | Average total biomass | SD |
|--------|----------------------|--------|----|----------------------|-------|-----------------------|--------|
| 60-90 | 79.25 | 45.93 | 12 | 21.96 | 13.23 | 101.21 | 56.82 |
| 40-60 | 68.12 | 37.41 | 12 | 34.01 | 22.79 | 102.14 | 58.30 |
| 20-40 | 61.76 | 31.94 | 12 | 61.40 | 24.49 | 123.16 | 53.31 |
| 0-20 | 76.72 | 46.57 | 12 | 129.01 | 60.92 | 205.73 | 93.51 |
| Totals | 285.85 | 152.61 | 12 | 246.39 | 96.66 | 532.24 | 238.15 |

Table 7c. Sawgrass biomass (leaves, culms, dead) in the flume, October, 1996

[Plants are 21 months old; layer in centimeters above sediment/water interface; sample biomass in grams dry weight per square meter; dead includes all dead material.]

| Sample biomass | | | | | | | | | |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Sample designation ---- | 1A | | | 1B | | | 1C | | |
| | Layer | Leaves | Culms | Dead | Leaves | Culms | Dead | Leaves | Culms |
| 60-90 | 86.47 | 16.94 | 19.73 | 121.13 | 22.17 | 36.10 | 94.51 | 11.34 | 25.04 |
| 40-60 | 48.44 | 15.21 | 25.26 | 99.03 | 34.23 | 59.35 | 81.23 | 19.52 | 63.36 |
| 20-40 | 39.61 | 48.15 | 87.83 | 42.91 | 72.76 | 104.77 | 40.97 | 36.45 | 84.82 |
| 0-20 | | 143.88 | 242.91 | 4.45 | 123.71 | 177.96 | 14.57 | 109.29 | 128.24 |
| total | 24.32 | 224.18 | 375.74 | 267.52 | 24.32 | 378.18 | 231.28 | 176.60 | 301.46 |
| Sample designation ---- | 2A | | | 2B | | | 2C | | |
| | Layer | Leaves | Culms | Dead | Leaves | Culms | Dead | Leaves | Culms |
| 60-90 | 34.23 | 9.11 | 5.09 | 78.36 | 14.85 | 43.85 | 19.45 | 4.74 | 8.68 |
| 40-60 | 26.19 | 13.99 | 7.61 | 65.45 | 28.06 | 72.33 | 17.94 | 7.46 | 22.96 |
| 20-40 | 17.65 | 13.42 | 30.57 | 21.38 | 57.98 | 78.58 | 6.60 | 9.90 | 42.19 |
| 0-20 | 6.17 | 23.68 | 44.63 | 3.88 | 93.86 | 72.41 | 1.29 | 16.65 | 137.56 |
| total | 84.25 | 60.21 | 87.91 | 169.07 | 194.76 | 267.16 | 45.28 | 38.75 | 211.40 |
| Sample designation ---- | 3A | | | 3B | | | 3C | | |
| | Layer | Leaves | Culms | Dead | Leaves | Culms | Dead | Leaves | Culms |
| 60-90 | 69.32 | 6.60 | 34.88 | 27.05 | 1.87 | 5.74 | 141.80 | 19.81 | 34.44 |
| 40-60 | 49.66 | 18.23 | 34.37 | 27.13 | 2.66 | 9.47 | 80.08 | 32.94 | 53.25 |
| 20-40 | 16.15 | 41.69 | 44.71 | 16.36 | 8.75 | 65.37 | 43.06 | 56.69 | 76.71 |
| 0-20 | 4.45 | 64.87 | 139.21 | 6.53 | 37.60 | 181.55 | 18.37 | 90.56 | 177.89 |
| total | 139.57 | 131.39 | 253.17 | 77.07 | 50.88 | 262.14 | 283.31 | 200.00 | 342.30 |
| Sample designation ---- | 4A | | | 4B | | | 4C | | |
| | Layer | Leaves | Culms | Dead | Leaves | Culms | Dead | Leaves | Culms |
| 60-90 | 77.43 | 19.16 | 23.18 | 37.24 | 8.90 | 17.72 | 25.83 | 2.73 | 9.04 |
| 40-60 | 64.94 | 23.25 | 30.79 | 21.74 | 18.08 | 22.32 | 16.36 | 5.67 | 7.10 |
| 20-40 | 26.26 | 42.34 | 39.04 | 12.70 | 42.12 | 41.91 | 4.88 | 22.25 | 40.33 |
| 0-20 | 11.63 | 62.14 | 126.01 | 3.30 | 53.60 | 70.76 | | 26.12 | 49.01 |
| total | 180.26 | 146.89 | 219.01 | 74.99 | 122.71 | 152.71 | 47.07 | 56.76 | 105.49 |

Table 7d. Summary of biomass (leaves, culms) in flume in October, 1996

[Plants are 21 months old; layer in centimeters above sediment/water interface; sample biomass in grams dry weight per square meter.]

| Layer | Average leaves | SD | N | Average culms | SD |
|-------|----------------|-------|----|---------------|-------|
| 60-90 | 67.74 | 39.78 | 12 | 11.52 | 6.97 |
| 40-60 | 49.85 | 28.28 | 12 | 18.27 | 10.18 |
| 20-40 | 24.05 | 14.21 | 12 | 37.71 | 20.47 |
| 0-20 | 6.22 | 5.79 | 12 | 70.50 | 41.78 |
| total | 135.33 | 90.26 | 12 | 118.95 | 70.71 |

Table 7e. Descriptive information on flume vegetation, October, 1996

[Plants are 21 months old; layer in centimeters above the sediment/water interface; average width in millimeters.]

| Layer | Large leaves | | Medium leaves | | Small leaves | | Large culms | | Small culms | |
|-------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|--------------------------------|---------------|--------------------------------|---------------|
| | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # culms/m ² | Average width | Average # culms/m ² | Average width |
| 60-90 | 6.0 | 9.7 | 180.0 | 6.3 | 70.6 | 3.9 | | | 35.9 | 4.7 |
| 40-60 | 5.4 | 10.8 | 166.8 | 6.9 | 56.2 | 4.0 | 3.6 | 10.9 | 33.5 | 5.9 |
| 20-40 | 7.2 | 11.6 | 83.7 | 7.4 | 19.1 | 4.1 | 19.1 | 11.5 | 22.1 | 8.0 |
| 0-20 | 13.8 | 9.9 | 13.8 | 8.3 | 0.6 | 3.0 | 40.7 | 15.2 | 7.2 | 8.8 |

Table 7f. Summary of leaves and culms in the flume, October, 1996

[Plants are 21 months old; layer in centimeters above the sediment/water interface; SD = standard deviation; N = number of samples.]

| Layer | Total leaves/m ² | SD | N | Total culms/m ² | SD |
|-------|-----------------------------|--------|----|----------------------------|-------|
| 60-90 | 256.5 | 125.16 | 12 | 35.9 | 19.11 |
| 40-60 | 228.4 | 113.33 | 12 | 37.1 | 17.26 |
| 20-40 | 110.0 | 60.92 | 12 | 41.3 | 18.64 |
| 0-20 | 28.1 | 20.17 | 12 | 47.8 | 24.35 |

Table 7g. Leaf area index by layer for the flume, October, 1996

[Leaf area index is calculated for live leaves and culms only; layer in centimeters above the sediment-water interface; see text for formulas.]

| Layer | Leaf Area Index | Corrected Leaf Area Index |
|-------|-----------------|---------------------------|
| 60-90 | 0.488 | 0.624 |
| 40-60 | 0.333 | 0.499 |
| 20-40 | 0.237 | 0.472 |
| 0-20 | 0.191 | 0.511 |
| Total | 1.248 | 2.106 |

Table 8a. Sawgrass biomass in the flume, March, 1997

[Plants are 27 months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter; dead includes all dead material.]

| Sample biomass | | | | | | | | | |
|-------------------------|--------|--------|---------|--------|--------|--------|--------|--------|---------|
| Sample designation ---- | 1A | | | 1B | | | 1C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 145.24 | 31.86 | 177.10 | 69.75 | 10.69 | 80.44 | 158.80 | 26.34 | 185.14 |
| 40-60 | 131.25 | 59.92 | 191.17 | 78.79 | 14.57 | 93.36 | 132.83 | 27.99 | 160.81 |
| 20-40 | 156.37 | 118.12 | 274.48 | 76.28 | 27.84 | 104.12 | 175.17 | 38.68 | 213.84 |
| 0-20 | 187.94 | 138.50 | 326.44 | 91.57 | 59.49 | 151.05 | 196.19 | 141.15 | 337.34 |
| Totals | 620.80 | 348.39 | 969.19 | 316.39 | 112.59 | 428.98 | 662.99 | 234.15 | 897.14 |
| Sample designation ---- | 2A | | | 2B | | | 2C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 81.30 | 70.40 | 151.70 | 190.74 | 64.58 | 255.32 | 67.24 | 29.92 | 97.16 |
| 40-60 | 53.25 | 55.11 | 108.36 | 108.21 | 38.18 | 146.39 | 54.82 | 20.88 | 75.71 |
| 20-40 | 61.93 | 98.60 | 160.53 | 108.14 | 64.01 | 172.15 | 63.36 | 53.96 | 117.33 |
| 0-20 | 84.75 | 257.62 | 342.37 | 147.04 | 120.92 | 267.95 | 62.93 | 68.03 | 130.96 |
| Totals | 281.23 | 481.72 | 762.95 | 554.13 | 287.69 | 841.82 | 248.36 | 172.80 | 421.16 |
| Sample designation ---- | 3A | | | 3B | | | 3C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 52.60 | 4.59 | 57.19 | 133.33 | 35.38 | 168.71 | 153.06 | 40.40 | 193.46 |
| 40-60 | 46.07 | 13.28 | 59.35 | 96.30 | 43.06 | 139.36 | 118.12 | 47.51 | 165.62 |
| 20-40 | 43.06 | 41.19 | 84.25 | 109.29 | 57.84 | 167.13 | 108.43 | 70.61 | 179.04 |
| 0-20 | 51.60 | 135.34 | 186.93 | 149.83 | 140.29 | 290.13 | 137.28 | 183.49 | 320.77 |
| Totals | 193.32 | 194.40 | 387.72 | 488.76 | 276.56 | 765.32 | 516.89 | 342.01 | 858.90 |
| Sample designation ---- | 4A | | | 4B | | | 4C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 159.45 | 39.97 | 199.42 | 53.68 | 16.29 | 69.97 | 185.07 | 67.02 | 252.09 |
| 40-60 | 131.82 | 43.70 | 175.52 | 50.73 | 5.45 | 56.19 | 142.87 | 58.05 | 200.93 |
| 20-40 | 146.18 | 65.59 | 211.76 | 46.14 | 9.11 | 55.26 | 199.92 | 75.92 | 275.85 |
| 0-20 | 343.08 | 110.94 | 454.03 | 82.81 | 59.78 | 142.59 | 235.01 | 111.73 | 346.74 |
| Totals | 780.53 | 260.20 | 1040.74 | 233.36 | 90.63 | 324.00 | 762.88 | 312.73 | 1075.61 |

Table 8b. Summary of sawgrass biomass in the flume, March, 1997

[Plants are 27 months old; layer in centimeters above sediment/water interface; sample biomass in grams dry weight per square meter; SD = standard deviation; N = number of samples; dead includes all dead material.]

| Layer | Average live biomass | SD | N | Average dead biomass | SD | Average total biomass | SD |
|--------|----------------------|--------|----|----------------------|--------|-----------------------|--------|
| 60-90 | 120.86 | 52.18 | 12 | 36.45 | 21.66 | 157.31 | 67.54 |
| 40-60 | 95.42 | 37.02 | 12 | 35.64 | 18.76 | 131.06 | 50.99 |
| 20-40 | 107.86 | 52.16 | 12 | 60.12 | 29.78 | 167.98 | 69.78 |
| 0-20 | 147.50 | 84.01 | 12 | 127.27 | 55.52 | 274.78 | 100.92 |
| Totals | 471.64 | 211.64 | 12 | 259.49 | 108.92 | 731.13 | 269.78 |

Table 8c. Sawgrass biomass (live and dead culms and leaves and dead litter) in the flume, March, 1997
 [Plants are 27 months old; sample biomass in grams dry weight per square meter; dead refers to dead standing leaves and culms; dead litter is tabulated separately.]

| Sample biomass | | | | | | | | | | |
|-------------------------|------------|------------|-------------|-------------|-------------|------------|------------|-------------|-------------|-------------|
| Sample designation ---- | | 1A | | | | 1B | | | | |
| Layer | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter |
| 60-90 | | 33.37 | 29.92 | 111.87 | 1.94 | | 46.86 | 10.69 | 22.89 | |
| 40-60 | | 67.67 | 44.85 | 63.58 | 15.07 | | 25.40 | 14.57 | 53.39 | |
| 20-40 | 15.43 | 107.78 | 33.51 | 48.58 | 69.18 | | 53.53 | 18.80 | 22.75 | 9.04 |
| 0-20 | 25.62 | 179.33 | 42.70 | 8.61 | 70.18 | | 87.26 | 8.68 | 4.31 | 50.81 |
| total | 41.05 | 388.15 | 150.98 | 232.65 | 156.37 | | 213.06 | 52.74 | 103.33 | 59.85 |
| Sample designation ---- | | 1C | | | | 2A | | | | |
| Layer | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter |
| 60-90 | | 44.56 | 26.34 | 114.24 | | | 17.15 | 70.40 | 64.15 | |
| 40-60 | | 43.13 | 27.99 | 89.70 | | | 25.04 | 50.81 | 28.20 | 4.31 |
| 20-40 | 8.25 | 94.22 | 16.07 | 80.95 | 14.35 | 14.42 | 48.37 | 21.17 | 13.56 | 63.01 |
| 0-20 | 33.37 | 156.15 | 18.94 | 40.04 | 88.84 | 45.42 | 76.21 | 74.70 | 8.54 | 137.49 |
| total | 41.62 | 338.06 | 89.34 | 324.93 | 103.19 | 59.85 | 166.77 | 217.07 | 114.46 | 204.80 |
| Sample designation ---- | | 2B | | | | 2C | | | | |
| Layer | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter |
| 60-90 | | 42.19 | 64.58 | 148.54 | | | 17.51 | 29.92 | 49.73 | |
| 40-60 | | 41.05 | 38.18 | 67.17 | | | 21.60 | 20.88 | 33.22 | |
| 20-40 | | 90.70 | 64.01 | 17.44 | | 4.02 | 45.14 | 25.47 | 18.23 | 24.47 |
| 0-20 | | 147.04 | 60.57 | 0.00 | 60.35 | 11.19 | 57.12 | 18.30 | 5.81 | 38.54 |
| total | | 320.99 | 227.34 | 233.15 | 60.35 | 15.21 | 141.37 | 94.58 | 106.92 | 63.01 |
| Sample designation ---- | | 3A | | | | 3B | | | | |
| Layer | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter |
| 60-90 | | 6.31 | 4.59 | 46.29 | | | 21.89 | 35.38 | 111.44 | |
| 40-60 | | 8.68 | 13.28 | 37.39 | | | 28.27 | 43.06 | 68.03 | |
| 20-40 | | 22.82 | 27.91 | 20.24 | 13.28 | 5.60 | 69.75 | 41.05 | 39.54 | 11.19 |
| 0-20 | 10.12 | 42.05 | 34.37 | 9.54 | 90.85 | 22.32 | 147.11 | 59.99 | 2.73 | 57.98 |
| total | 10.12 | 79.87 | 80.16 | 113.45 | 104.12 | 27.91 | 267.02 | 179.47 | 221.74 | 69.18 |
| Sample designation ---- | | 3C | | | | 4A | | | | |
| Layer | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter |
| 60-90 | | 22.96 | 40.40 | 130.10 | | | 48.08 | 39.97 | 111.37 | |
| 40-60 | | 27.99 | 47.51 | 90.13 | | | 54.75 | 43.70 | 77.07 | |
| 20-40 | 13.42 | 69.75 | 35.02 | 38.68 | 22.17 | 4.45 | 87.62 | 52.46 | 58.56 | 8.68 |
| 0-20 | 53.75 | 115.32 | 58.34 | 21.96 | 71.40 | | 320.12 | 27.63 | 22.96 | 83.31 |
| total | 67.17 | 236.02 | 181.27 | 280.87 | 93.58 | 4.45 | 510.57 | 163.76 | 269.96 | 92.00 |

Table 8c. Sawgrass biomass (live and dead culms and leaves and dead litter) in the flume, March, 1997, continued

[Plants are 27 months old; sample biomass in grams dry weight per square meter; dead refers to dead standing leaves and culms; dead litter is tabulated separately.]

| Sample designation ---- | Sample biomass | | | | | | | | | | |
|-------------------------|----------------|------------|------------|-------------|-------------|-------------|------------|------------|-------------|-------------|-------------|
| | Layer | 4B | | | | | 4C | | | | |
| | | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter | Dead culms | Live culms | Dead leaves | Live leaves | Dead litter |
| 60-90 | | 6.96 | 16.29 | 46.72 | | | 55.97 | 67.02 | 129.10 | | |
| 40-60 | | 12.41 | 5.45 | 38.32 | | | 59.13 | 52.46 | 83.74 | 5.60 | |
| 20-40 | | 19.66 | 9.11 | 26.48 | | | 145.96 | 55.26 | 53.96 | 20.67 | |
| 0-20 | | 79.37 | 17.01 | 3.44 | 42.77 | 28.13 | 223.17 | 18.23 | 11.84 | 65.37 | |
| total | | 118.40 | 47.86 | 114.96 | 42.77 | 28.13 | 484.24 | 192.96 | 278.64 | 91.64 | |

Table 8d. Summary of biomass (live and dead culms and leaves and dead litter) in the flume, March 1997

[Plants are 27 months old; biomass in grams dry weight per square meter; SD = standard deviation, N = number of samples.]

| Layer | Mean dead culms | SD | Mean live culms | SD | Mean dead leaves | SD | Mean live leaves | SD | Mean dead litter | SD | N |
|-------|-----------------|-------|-----------------|--------|------------------|-------|------------------|-------|------------------|-------|----|
| 60-90 | | | 30.32 | 17.02 | 36.29 | 21.70 | 90.54 | 41.69 | 0.16 | 0.56 | 12 |
| 40-60 | | | 34.59 | 18.61 | 33.56 | 16.36 | 60.83 | 22.40 | 2.08 | 4.52 | 12 |
| 20-40 | 5.47 | 6.05 | 71.28 | 36.46 | 33.32 | 17.01 | 36.58 | 20.68 | 21.34 | 22.31 | 12 |
| 0-20 | 19.16 | 18.67 | 135.85 | 79.01 | 36.62 | 21.98 | 11.65 | 11.42 | 71.49 | 26.72 | 12 |
| total | 24.63 | 23.66 | 272.04 | 140.02 | 139.79 | 63.70 | 199.59 | 83.06 | 95.07 | 45.58 | 12 |

Table 8e. Descriptive information on flume vegetation, March, 1997

[Plants are 27 months old; dead leaves and culms were erect and standing; dead litter was not counted; layer in centimeters above the sediment/water interface; average width in millimeters.]

| LIVE | | Large leaves | | Medium leaves | | Small leaves | | Large culms | | Small culms | |
|-------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|--------------------------------|---------------|--------------------------------|---------------|--|
| Layer | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # culms/m ² | Average width | Average # culms/m ² | Average width | |
| 60-90 | 28.7 | 11.4 | 139.3 | 7.3 | 58.0 | 4.2 | 7.8 | 12.7 | 19.1 | 6.5 | |
| 40-60 | 39.5 | 12.4 | 100.5 | 7.8 | 45.5 | 4.0 | 16.7 | 13.7 | 11.4 | 7.4 | |
| 20-40 | 36.5 | 13.2 | 57.4 | 8.1 | 9.6 | 4.0 | 26.9 | 17.4 | 10.2 | 6.5 | |
| 0-20 | 26.9 | 14.9 | 2.4 | 8.2 | 2.4 | 4.8 | 32.3 | 24.7 | 5.4 | 6.4 | |
| DEAD | | Large leaves | | Medium leaves | | Small leaves | | Large culms | | Small culms | |
| Layer | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # leaves/m ² | Average width | Average # culms/m ² | Average width | Average # culms/m ² | Average width | |
| 60-90 | 2.4 | 11.3 | 73.0 | 7.1 | 49.0 | 4.1 | | | | | |
| 40-60 | 3.0 | 11.3 | 101.7 | 6.9 | 53.8 | 4.3 | | | | | |
| 20-40 | 23.3 | 12.5 | 104.1 | 7.4 | 35.9 | 4.2 | 1.8 | 12.0 | 7.2 | 6.9 | |
| 0-20 | 38.3 | 14.5 | 81.9 | 7.3 | 22.7 | 4.2 | 9.0 | 15.5 | 7.8 | 8.1 | |

Table 8f. Summary of leaves and culms in the flume, March, 1997

[Plants are 27 months old; dead leaves and culms were erect and standing; dead litter was not counted; layer in centimeters above the sediment/water interface; SD = standard deviation; N = number of samples.]

| LIVE Layer | Total leaves/m ² | SD | N | Total culms/m ² | SD |
|------------|-----------------------------|--------|----|----------------------------|-------|
| 60-90 | 226.0 | 89.86 | 12 | 26.9 | 10.65 |
| 40-60 | 185.4 | 71.49 | 12 | 28.1 | 12.41 |
| 20-40 | 103.5 | 50.69 | 12 | 37.1 | 19.07 |
| 0-20 | 31.7 | 26.58 | 12 | 37.7 | 17.34 |
| DEAD Layer | Total leaves/m ² | SD | N | Total culms/m ² | SD |
| 60-90 | 124.4 | 70.60 | 12 | | |
| 40-60 | 158.5 | 114.02 | 12 | | |
| 20-40 | 163.3 | 72.35 | 12 | 9.0 | 9.24 |
| 0-20 | 142.9 | 83.93 | 12 | 16.7 | 15.70 |

Table 8g. Leaf area index by layer for the flume, March, 1997

[Leaf area index is calculated for live leaves and culms plus dead standing leaves and culms; layer in centimeters above the sediment-water interface; see text for formulas.]

| Layer | Leaf Area Index | Corrected Leaf Area Index |
|-------|-----------------|---------------------------|
| 60-90 | 0.771 | 1.004 |
| 40-60 | 0.560 | 0.769 |
| 20-40 | 0.577 | 0.898 |
| 0-20 | 0.577 | 1.075 |
| Total | 2.485 | 3.746 |

Table 9a. Sawgrass biomass in the flume, layers 0-20 through 60-90 centimeters, June, 1997

[Plants are 30 months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter.]

| Sample biomass | | | | | | | | | |
|-------------------------|---------|--------|---------|--------|--------|--------|---------|--------|---------|
| Sample designation ---- | 1A | | | 1B | | | 1C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 117.11 | 20.88 | 137.99 | 37.39 | 4.95 | 42.34 | 80.16 | 77.43 | 157.58 |
| 40-60 | 77.07 | 55.69 | 132.76 | 30.71 | 7.25 | 37.96 | 60.42 | 65.30 | 125.72 |
| 20-40 | 91.21 | 84.10 | 175.31 | 19.09 | 23.47 | 42.55 | 64.37 | 88.91 | 153.28 |
| 0-20 | 108.21 | 168.85 | 277.07 | 35.38 | 90.92 | 126.30 | 88.55 | 216.36 | 304.91 |
| Total | 393.60 | 329.52 | 723.13 | 122.57 | 126.58 | 249.15 | 293.50 | 448.00 | 741.50 |
| Sample designation ---- | 2A | | | 2B | | | 2C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 105.06 | 24.83 | 129.89 | 72.33 | 8.32 | 80.66 | 264.08 | 63.44 | 327.51 |
| 40-60 | 77.93 | 56.83 | 134.77 | 46.86 | 56.62 | 103.48 | 199.42 | 125.22 | 324.64 |
| 20-40 | 98.96 | 107.78 | 206.74 | 35.38 | 106.20 | 141.58 | 176.53 | 110.94 | 287.47 |
| 0-20 | 177.61 | 169.35 | 346.96 | 76.21 | 160.02 | 236.23 | 382.55 | 155.65 | 538.20 |
| Total | 459.55 | 358.80 | 818.35 | 230.78 | 331.17 | 561.95 | 1022.58 | 455.25 | 1477.83 |
| Sample designation ---- | 3A | | | 3B | | | 3C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 140.15 | 13.56 | 153.71 | 75.42 | 4.09 | 79.51 | 42.19 | 0.00 | 42.19 |
| 40-60 | 94.87 | 35.23 | 130.10 | 44.20 | 12.06 | 56.26 | 69.32 | 10.26 | 79.58 |
| 20-40 | 89.63 | 50.38 | 140.00 | 52.82 | 15.79 | 68.60 | 34.01 | 22.39 | 56.40 |
| 0-20 | 133.76 | 151.20 | 284.96 | 53.03 | 106.92 | 159.95 | 40.47 | 120.13 | 160.60 |
| Total | 458.40 | 250.37 | 708.77 | 225.47 | 138.86 | 364.33 | 186.00 | 152.78 | 338.78 |
| Sample designation ---- | 4A | | | 4B | | | 4C | | |
| Layer | Live | Dead | Total | Live | Dead | Total | Live | Dead | Total |
| 60-90 | 405.52 | 102.40 | 507.92 | 102.69 | 6.67 | 109.36 | 279.65 | 49.01 | 328.66 |
| 40-60 | 219.80 | 136.49 | 356.29 | 119.27 | 27.27 | 146.53 | 191.89 | 93.43 | 285.32 |
| 20-40 | 204.87 | 138.28 | 343.16 | 93.93 | 60.28 | 154.21 | 183.63 | 108.93 | 292.57 |
| 0-20 | 283.67 | 260.78 | 544.44 | 118.62 | 134.05 | 252.67 | 278.86 | 170.21 | 449.07 |
| Total | 1113.86 | 637.95 | 1751.81 | 434.51 | 228.27 | 662.78 | 934.03 | 421.59 | 1355.62 |

Table 9b. Summary of sawgrass biomass in the flume, layers 0-20 through 60-90 centimeters, June, 1997

[Plants are 30 months old; layer in centimeters above the sediment/water interface; sample biomass in grams dry weight per square meter.]

| Layer | Average live biomass | SD | N | Average dead biomass | SD | Average total biomass | SD |
|-------|----------------------|--------|----|----------------------|--------|-----------------------|--------|
| 60-90 | 143.48 | 113.14 | 12 | 31.30 | 33.77 | 174.78 | 141.24 |
| 40-60 | 102.65 | 65.54 | 12 | 56.80 | 43.07 | 159.45 | 104.57 |
| 20-40 | 95.37 | 62.08 | 12 | 76.45 | 41.01 | 171.82 | 96.20 |
| 0-20 | 148.08 | 111.20 | 12 | 158.70 | 46.25 | 306.78 | 140.35 |
| Total | 489.57 | 342.12 | 12 | 323.26 | 153.48 | 812.83 | 474.01 |

Table 9c. Sawgrass biomass (dead and live leaves and culms) in the flume, layers 0-20 through 60-90 centimeters, June, 1997

[Plants are 30 months old; sample biomass in grams dry weight per square meter; dead refers to dead standing leaves and culms; dead litter is tabulated separately.]

| Sample biomass | | | | | | | | | | |
|-------------------------|-------------|-------------|------------|------------|--------|-------------|-------------|------------|------------|--------|
| Sample designation ---- | | 1A | | | 1B | | | | | |
| Layer | Live leaves | Dead leaves | Live culms | Dead culms | Dead | Live leaves | Dead leaves | Live culms | Dead culms | Dead |
| 60-90 | 94.51 | 20.88 | 22.60 | | | 33.44 | 3.95 | 3.95 | | 1.00 |
| 40-60 | 39.11 | 28.49 | 37.96 | | 27.20 | 23.25 | 7.25 | 7.46 | | |
| 20-40 | 16.07 | 33.01 | 75.13 | 4.45 | 46.64 | 0.00 | 11.19 | 19.09 | | 12.27 |
| 0-20 | 3.80 | 11.63 | 104.41 | 29.42 | 127.80 | 2.08 | 8.61 | 33.30 | 36.17 | 46.14 |
| Total | 153.49 | 94.01 | 240.11 | 33.87 | 201.65 | 58.77 | 31.00 | 63.79 | 36.17 | 59.42 |
| Sample designation ---- | | 1C | | | 2A | | | | | |
| Layer | Live leaves | Dead leaves | Live culms | Dead culms | Dead | Live leaves | Dead leaves | Live culms | Dead culms | Dead |
| 60-90 | 71.83 | 34.88 | 8.32 | | 42.55 | 95.23 | 5.67 | 9.83 | | 19.16 |
| 40-60 | 45.28 | 52.89 | 15.14 | | 12.41 | 55.54 | 20.38 | 22.39 | | 36.45 |
| 20-40 | 4.81 | 66.02 | 59.56 | 6.75 | 16.15 | 21.10 | 38.25 | 77.86 | 3.23 | 66.31 |
| 0-20 | | 25.47 | 88.55 | 13.28 | 177.61 | | 9.83 | 177.61 | 19.16 | 140.36 |
| Total | 121.92 | 179.26 | 171.58 | 20.02 | 248.72 | 171.87 | 74.13 | 287.69 | 22.35 | 262.28 |
| Sample designation ---- | | 2B | | | 2C | | | | | |
| Layer | Live leaves | Dead leaves | Live culms | Dead culms | Dead | Live leaves | Dead leaves | Live culms | Dead culms | Dead |
| 60-90 | 68.89 | 8.32 | 3.44 | | | 216.28 | 55.97 | 47.79 | | 7.46 |
| 40-60 | 33.22 | 55.04 | 13.63 | | 1.58 | 119.48 | 60.06 | 79.94 | | 65.16 |
| 20-40 | 5.53 | 48.58 | 29.85 | | 57.62 | 19.16 | 61.07 | 157.37 | 4.95 | 44.92 |
| 0-20 | | 33.51 | 76.21 | 22.82 | 103.69 | 0.00 | 24.61 | 382.55 | 16.00 | 115.03 |
| Total | 107.64 | 145.46 | 123.14 | 22.82 | 162.90 | 354.92 | 201.72 | 667.66 | 20.95 | 232.57 |
| Sample designation ---- | | 3A | | | 3B | | | | | |
| Layer | Live leaves | Dead leaves | Live culms | Dead culms | Dead | Live leaves | Dead leaves | Live culms | Dead culms | Dead |
| 60-90 | 123.00 | 13.56 | 17.15 | | | 67.96 | 4.09 | 7.46 | | |
| 40-60 | 69.39 | 32.22 | 25.47 | | 3.01 | 37.32 | 10.26 | 6.89 | | 1.79 |
| 20-40 | 4.81 | 45.35 | 84.82 | | 5.02 | 10.05 | 15.14 | 42.77 | | 0.65 |
| 0-20 | 1.00 | 16.58 | 132.76 | 1.22 | 133.40 | | 22.75 | 53.03 | 3.01 | 81.16 |
| Total | 198.20 | 107.71 | 260.20 | 1.22 | 141.44 | 115.32 | 52.24 | 110.15 | 3.01 | 83.60 |
| Sample designation ---- | | 3C | | | 4A | | | | | |
| Layer | Live leaves | Dead leaves | Live culms | Dead culms | Dead | Live leaves | Dead leaves | Live culms | Dead culms | Dead |
| 60-90 | 39.32 | | 2.87 | | | 339.28 | 93.07 | 66.23 | | 9.33 |
| 40-60 | 62.07 | 10.26 | 7.25 | | | 128.31 | 119.34 | 91.49 | | 17.15 |
| 20-40 | 10.98 | 15.36 | 23.03 | | 7.03 | 6.31 | 123.79 | 198.56 | 2.51 | 11.98 |
| 0-20 | | 8.47 | 40.47 | 12.92 | 98.74 | | 34.80 | 283.67 | 3.88 | 222.10 |
| Total | 112.38 | 34.09 | 73.63 | 12.92 | 105.77 | 473.90 | 371.00 | 639.96 | 6.39 | 260.56 |

Table 9d. Sawgrass biomass (dead and live leaves and culms) in the flume, layers 0-20 through 60-90 centimeters, June, 1997, continued

[Plants are 30 months old; sample biomass in grams dry weight per square meter; dead refers to dead standing leaves and culms; dead litter is tabulated separately.]

| Sample designation ---- | Sample biomass | | | | | | | | | |
|-------------------------|----------------|-------------|-------------|------------|------------|--------|-------------|-------------|------------|------------|
| | Layer | 4B | | | | 4C | | | | |
| | | Live leaves | Dead leaves | Live culms | Dead culms | Dead | Live leaves | Dead leaves | Live culms | Dead culms |
| 60-90 | 93.72 | 4.02 | 8.97 | 0.00 | 2.66 | 223.75 | 49.01 | 55.90 | 0.00 | 0.00 |
| 40-60 | 76.64 | 16.65 | 42.63 | 0.00 | 10.62 | 111.01 | 91.64 | 80.87 | 0.00 | 1.79 |
| 20-40 | 13.63 | 36.17 | 80.30 | 4.81 | 19.30 | 26.12 | 77.50 | 157.51 | 4.23 | 27.20 |
| 0-20 | 0.00 | 9.83 | 118.62 | 3.59 | 120.63 | 0.00 | 13.63 | 278.86 | 4.31 | 152.27 |
| Total | 183.99 | 66.67 | 250.51 | 8.40 | 153.21 | 360.88 | 231.78 | 573.15 | 8.54 | 181.27 |

Table 9e. Summary of biomass (live and dead leaves and culms and dead litter) in the flume, June, 1997

[Plants are 30 months old; biomass in grams dry weight per square meter; SD = standard deviation; N = number of samples.]

| Layer | Average live leaves | SD | Average dead leaves | SD | Average live culms | SD | Average dead culms | SD | Average dead litter | SD | N |
|-------|---------------------|--------|---------------------|--------|--------------------|--------|--------------------|-------|---------------------|-------|----|
| 60-90 | 122.27 | 91.28 | 24.45 | 28.62 | 21.21 | 22.44 | | | 6.85 | 12.67 | 12 |
| 40-60 | 66.72 | 35.53 | 42.04 | 35.25 | 35.93 | 31.32 | | | 14.76 | 19.72 | 12 |
| 20-40 | 11.55 | 7.84 | 47.62 | 31.73 | 83.82 | 58.15 | 2.58 | 2.48 | 26.26 | 22.11 | 12 |
| 0-20 | 0.57 | 1.20 | 18.31 | 9.62 | 147.50 | 111.53 | 13.81 | 11.39 | 126.58 | 45.35 | 12 |
| Total | 201.11 | 127.04 | 132.42 | 100.07 | 288.46 | 217.92 | 16.39 | 11.50 | 174.45 | 69.21 | 12 |

Table 9f. Descriptive information on flume vegetation, layers 0-20 through 60-90 centimeters, June, 1997

[Plants are 30 months old; dead leaves and culms were erect and standing; dead litter was not counted; layer in centimeters above sediment/water interface; average width in millimeters.]

| LIVE Layer | Avg # of Lg. leaves/m ² | Average width | Avg # of Med. leaves/m ² | Average width | Avg # of Sm. leaves/m ² | Average width | Avg # of Lg. culms/m ² | Average width | Avg # of Sm. culms/m ² | Average width |
|------------|------------------------------------|---------------|-------------------------------------|---------------|------------------------------------|---------------|-----------------------------------|---------------|-----------------------------------|---------------|
| 60-90 | 26.9 | 11.3 | 218.3 | 7.2 | 38.3 | 3.3 | 1.2 | 13.5 | 32.9 | 5.3 |
| 40-60 | 31.1 | 13.8 | 125.0 | 7.5 | 35.3 | 4.0 | 11.4 | 13.2 | 29.9 | 5.8 |
| 20-40 | 19.5 | 13.8 | 10.2 | 7.3 | 9.0 | 2.9 | 30.5 | 14.5 | 15.0 | 7.4 |
| 0-20 | 0.6 | 11.0 | 0.6 | 6.0 | 0.6 | 5.0 | 40.7 | 20.7 | 5.0 | 6.4 |
| DEAD Layer | Avg # of Lg. leaves/m ² | Average width | Avg # of Med. leaves/m ² | Average width | Avg # of Sm. leaves/m ² | Average width | Avg # of Lg. culms/m ² | Average width | Avg # of Sm. culms/m ² | Average width |
| 60-90 | 1.2 | 12.0 | 65.8 | 6.5 | 17.3 | 3.8 | | | 0.00 | |
| 40-60 | 21.5 | 14.8 | 107.0 | 6.8 | 22.7 | 4.3 | | | 0.00 | |
| 20-40 | 61.0 | 16.1 | 102.3 | 7.7 | 12.0 | 4.3 | 0.6 | 15.0 | 4.78 | 7.67 |
| 0-20 | 37.7 | 14.9 | 20.9 | 6.9 | 7.8 | 3.7 | 7.2 | 15.0 | 6.58 | 8.54 |

Table 9g. Summary of leaves and culms in the flume, June, 1997

[Plants are 30 months old; dead leaves and culms were erect and standing; dead litter was not counted; layer in centimeters above the sediment/water interface; SD = standard deviation; N = number of samples.]

| LIVE Layer | Total leaves/m ² | SD | N | Total culms/m ² | SD |
|------------|-----------------------------|--------|----|----------------------------|-------|
| 60-90 | 283.5 | 154.77 | 12 | 34.1 | 21.45 |
| 40-60 | 191.4 | 75.59 | 12 | 41.3 | 24.12 |
| 20-40 | 38.7 | 22.4 | 12 | 45.4 | 23.77 |
| 0-20 | 1.8 | 3.25 | 12 | 49.6 | 28.45 |
| DEAD Layer | Total leaves/m ² | SD | N | Total culms/m ² | SD |
| 60-90 | 77.1 | 89.48 | 12 | | |
| 40-60 | 139.3 | 130.02 | 12 | | |
| 20-40 | 165.0 | 117.14 | 12 | 4.8 | 6.21 |
| 0-20 | 66.4 | 35.83 | 12 | 13.8 | 9.41 |

Table 9h. Leaf area index by layer for the flume, June, 1997

[Leaf area index is calculated for live leaves and culms plus dead standing leaves and culms; layer in centimeters above the sediment-water interface; see text for formulas.]

| Layer | Leaf Area Index | Corrected Leaf Area Index |
|-------|-----------------|---------------------------|
| 60-90 | 0.862 | 0.897 |
| 40-60 | 0.653 | 0.719 |
| 20-40 | 0.545 | 0.643 |
| 0-20 | 0.336 | 0.572 |
| Total | 2.395 | 2.831 |

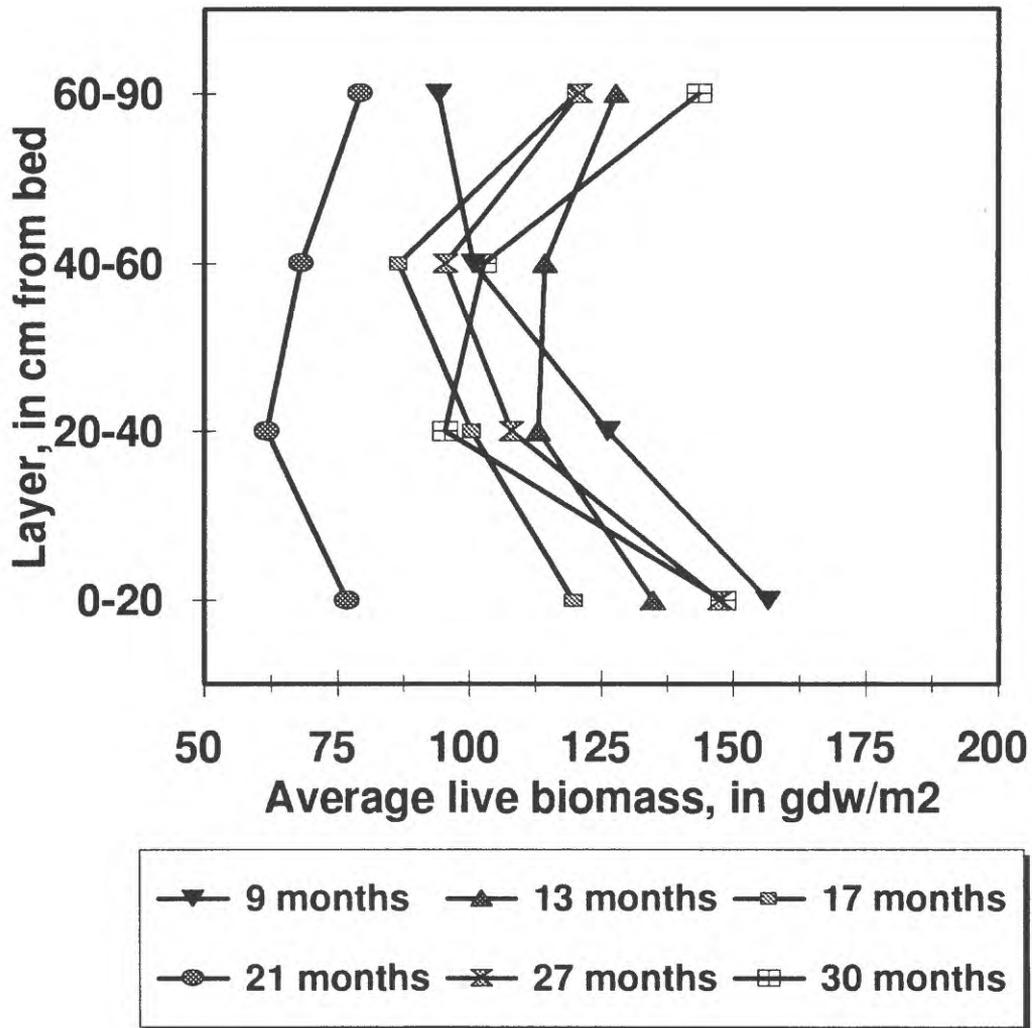


Figure 1. Average live biomass in the flume, 1995-97.

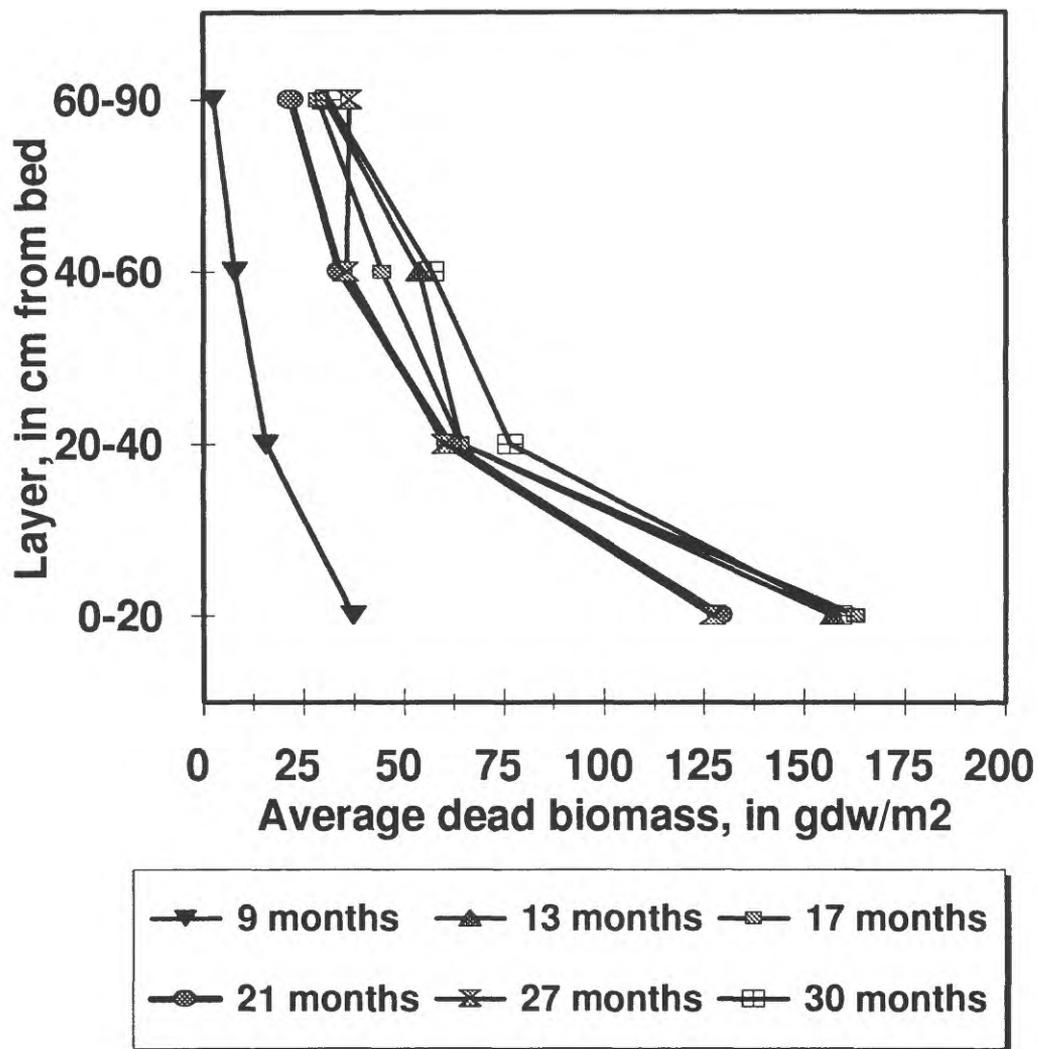


Figure 2. Average dead biomass in the flume, 1995-97.

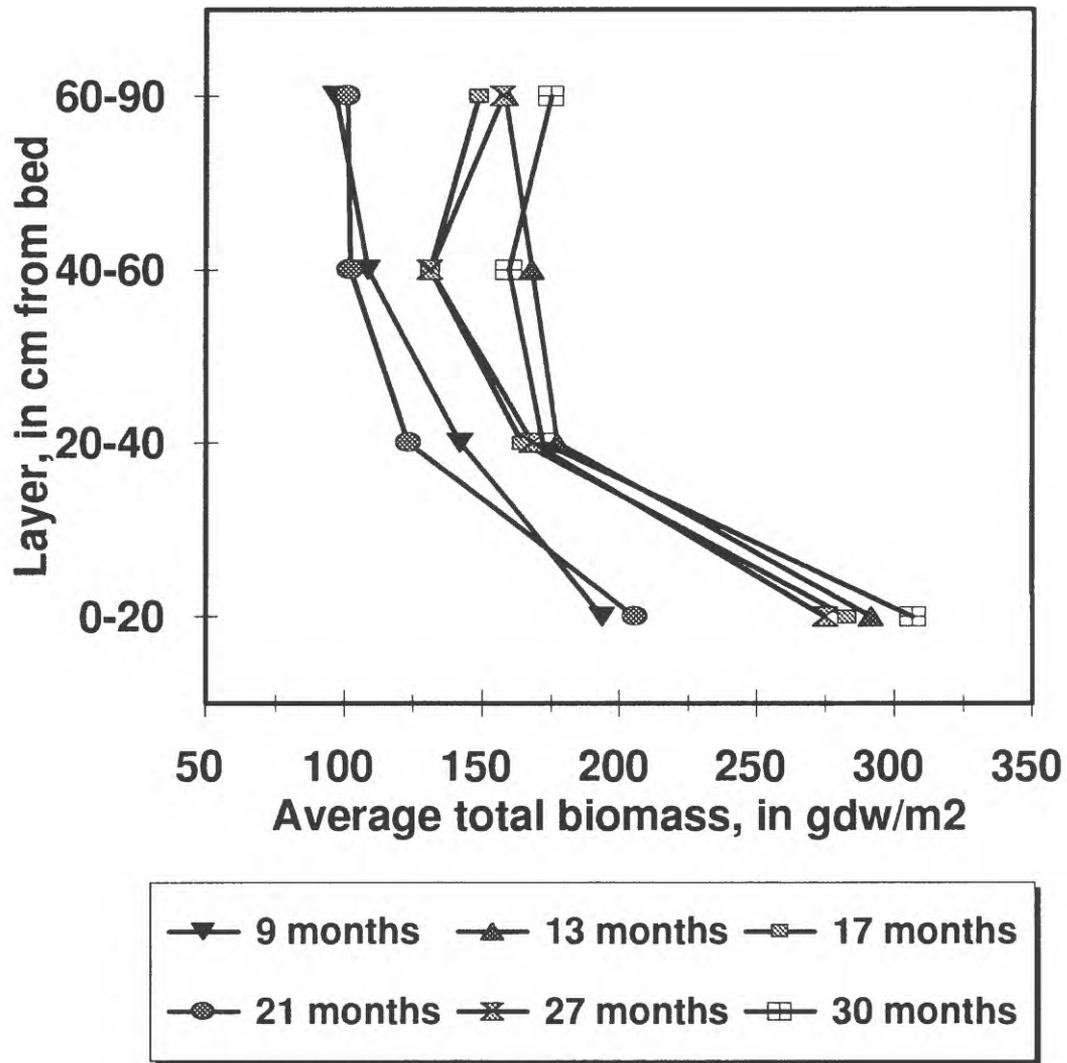


Figure 3. Average total biomass in the flume, 1995-97.

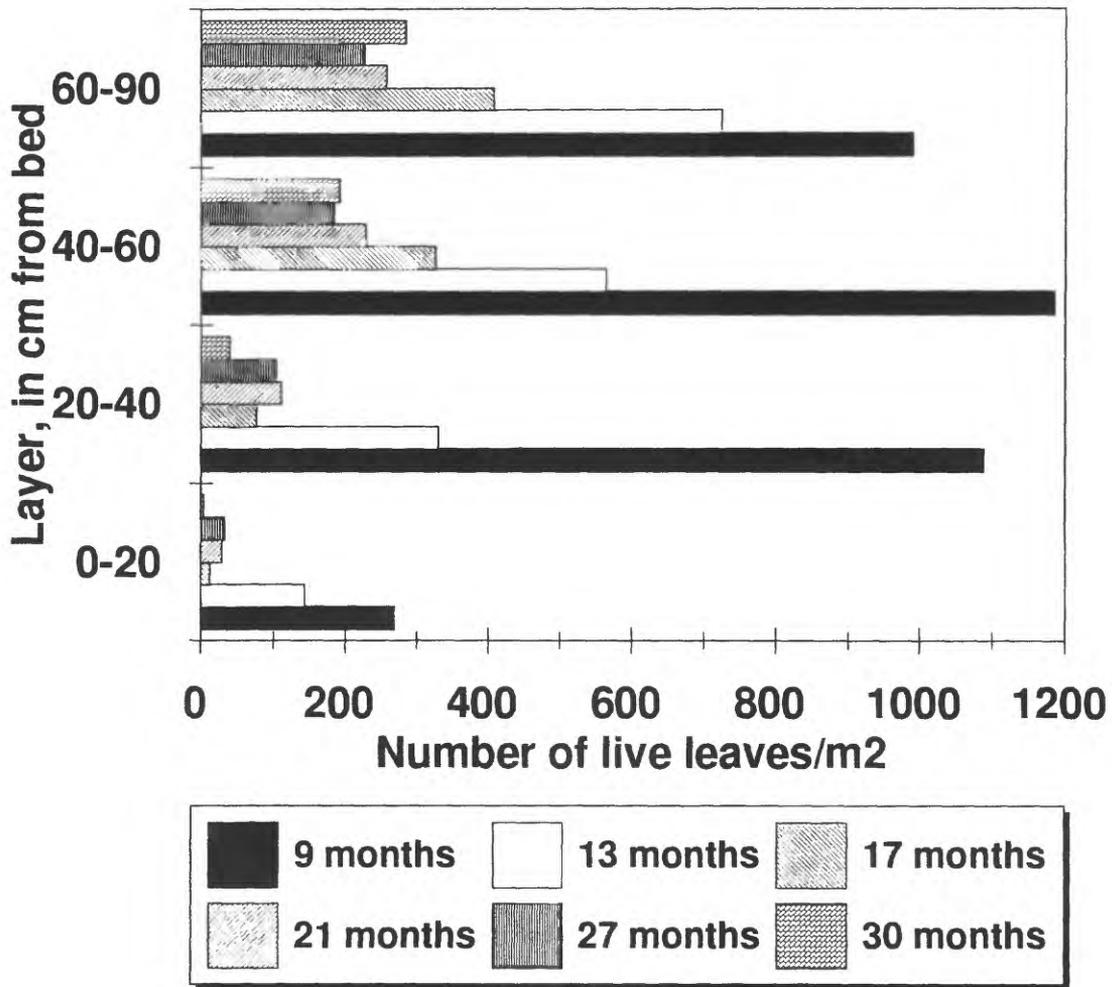


Figure 4. Number of live leaves in the flume, 1995-97.

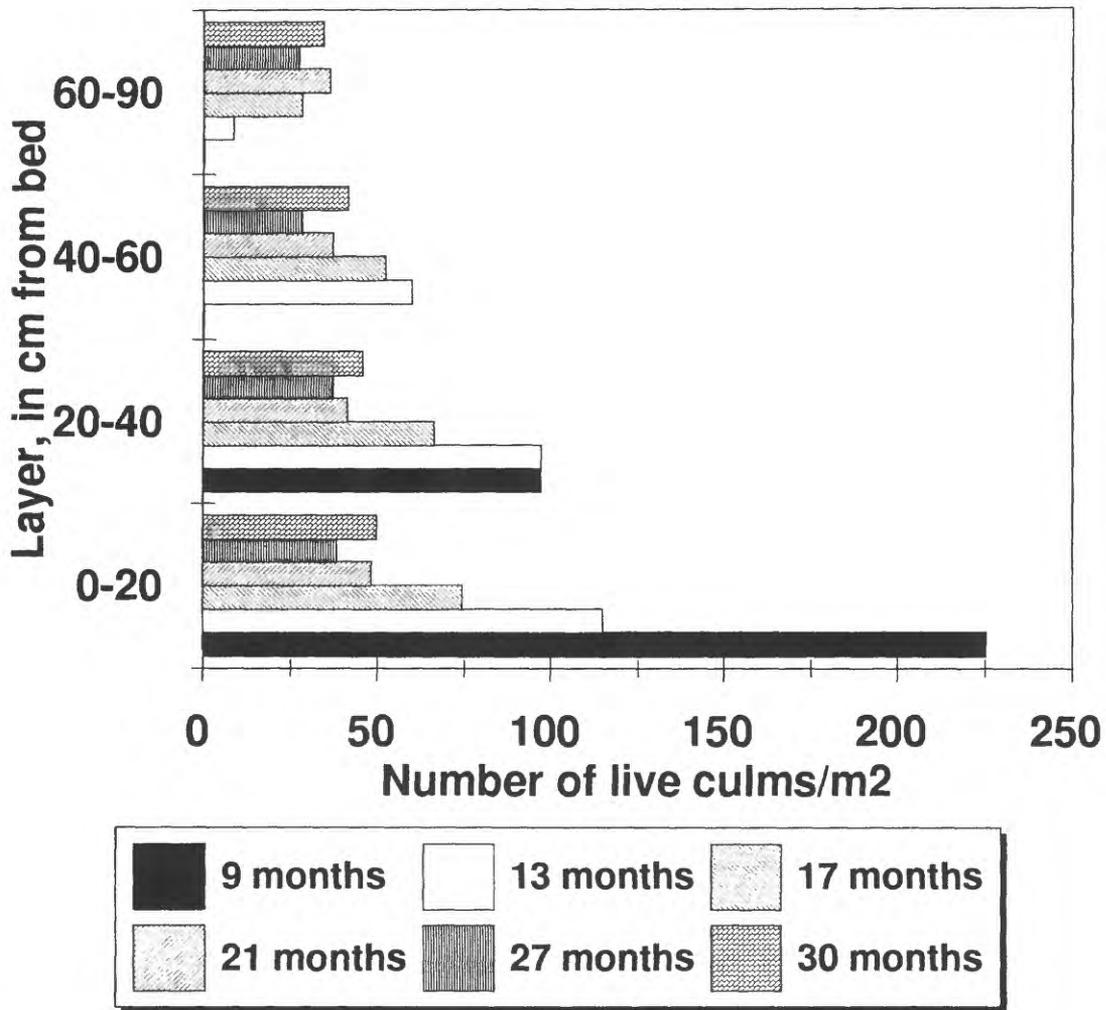


Figure 5. Number of live culms in the flume, 1995-97.