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WATER QUALITY PROTECTION PROGRAM
SEAGRASS STATUS & TRENDS MONITORING**

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Table of Contents

List of Tables & Figures

Summary of Accomplishments

Section I: Station Locations & Work Effort

Section II: Quarterly Station Summary Data

Section III: Spatiotemporal Patterns in the FKNMS

Appendix A: Second Quarter (March 1997) Data Report

Appendix B: Third Quarter (June 1997) Data Report

Appendix C: Fourth Quarter (September 1997) Data Report

List of Tables & Figures

Section I: Station Locations & Work Effort

- Figure 1. Locations of sites samples in 1996 (May - August) in the FKNMS.
- Figure 2. Locations of sites samples in 1997 (May - August) in the FKNMS.
- Figure 3. Locations of sites samples in 1996 (May - August) in the FKNMS.
- Table 1. Field sampling effort for summer and quarterly collections for FY 1997.

Section II: Quarterly Station Summary Data

- Figure 4a. Site 214. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 4b. Site 214. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 4c. Site 214. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 4d. Site 214. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 4e. Site 214. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 5a. Site 216. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 5b. Site 216. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 5c. Site 216. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 5d. Site 216. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 5e. Site 216. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 6a. Site 220. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 6b. Site 220. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 6c. Site 220. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 6d. Site 220. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 6e. Site 220. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 7a. Site 223. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 7b. Site 223. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 7c. Site 223. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 7d. Site 223. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 7e. Site 223. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 8a. Site 225. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 8b. Site 225. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 8c. Site 225. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 8d. Site 225. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 8e. Site 225. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 9a. Site 225. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 9b. Site 225. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 9c. Site 225. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 9d. Site 225. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 9e. Site 225. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 10a. Site 227. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 10b. Site 227. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 10c. Site 227. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 10d. Site 227. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 10e. Site 227. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 11a. Site 235. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 11b. Site 235. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 11c. Site 235. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 11d. Site 235. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 11e. Site 235. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 12a. Site 237. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 12b. Site 237. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 12c. Site 237. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 12d. Site 237. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 12e. Site 237. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 13a. Site 239. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 13b. Site 239. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 13c. Site 239. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 13d. Site 239. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 13e. Site 239. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 14a. Site 241. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 14b. Site 241. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 14c. Site 241. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 14d. Site 241. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 14e. Site 241. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 15a. Site 243. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 15b. Site 243. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 15c. Site 243. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 15d. Site 243. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 15e. Site 243. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 16a. Site 248. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 16b. Site 248. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 16c. Site 248. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 16d. Site 248. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 16e. Site 248. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 17a. Site 255. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 17b. Site 255. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 17c. Site 255. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 17d. Site 255. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 17e. Site 255. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 18a. Site 260. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 18b. Site 260. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 18c. Site 260. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 18d. Site 260. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 18e. Site 260. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 19a. Site 271. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 19b. Site 271. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 19c. Site 271. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 19d. Site 271. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 19e. Site 271. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 20a. Site 276. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 20b. Site 276. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 20c. Site 276. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 20d. Site 276. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 20e. Site 276. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 21a. Site 284. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 21b. Site 284. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 21c. Site 284. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 21d. Site 284. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 21e. Site 284. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 22a. Site 285. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 22b. Site 285. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 22c. Site 285. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 22d. Site 285. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 22e. Site 285. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 23a. Site 287. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 23b. Site 287. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 23c. Site 287. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 23d. Site 287. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 23e. Site 287. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 24a. Site 291. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 24b. Site 291. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 24c. Site 291. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 24d. Site 291. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 24e. Site 291. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 25a. Site 294. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 25b. Site 294. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 25c. Site 294. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 25d. Site 294. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 25e. Site 294. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 26a. Site 294. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 26b. Site 294. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 26c. Site 294. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 26d. Site 294. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 26e. Site 294. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 27a. Site 296. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 27b. Site 296. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 27c. Site 296. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 27d. Site 296. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 27e. Site 296. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 28a. Site 305. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 28b. Site 305. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 28c. Site 305. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 28d. Site 305. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 28e. Site 305. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 29a. Site 307. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 29b. Site 307. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 29c. Site 307. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 29d. Site 307. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 29e. Site 307. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

- Figure 30a. Site 309. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 30b. Site 309. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 30c. Site 309. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 30d. Site 309. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 30e. Site 309. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.
- Figure 31a. Site 314. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect.
- Figure 31b. Site 314. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*.
- Figure 31c. Site 314. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*.
- Figure 31d. Site 314. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*.
- Figure 31e. Site 314. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*.

Section III: Spatiotemporal Patterns in the FKNMS

- Figure 32a. Contours of *Thalassia testudinum* short shoot density (m^{-2}) for individual sampling dates in 1996.
- Figure 32b. Contours of *Thalassia testudinum* short shoot density (m^{-2}) for individual sampling dates in 1997.
- Figure 33a. Contours of *Thalassia testudinum* standing crop (g m^{-2}) for individual sampling dates in 1996.
- Figure 33b. Contours of *Thalassia testudinum* standing crop (g m^{-2}) for individual sampling dates in 1997.

- Figure 34a. Contours of *Thalassia testudinum* leaf mass (mg SS^{-1}) for individual sampling dates in 1996.
- Figure 34b. Contours of *Thalassia testudinum* leaf mass (mg SS^{-1}) for individual sampling dates in 1997.
- Figure 35a. Contours of *Thalassia testudinum* short shoot productivity ($\text{mg SS}^{-1} \text{d}^{-1}$) for individual sampling dates in 1996.
- Figure 35b. Contours of *Thalassia testudinum* short shoot productivity ($\text{mg SS}^{-1} \text{d}^{-1}$) for individual sampling dates in 1997.
- Figure 36a. Contours of *Thalassia testudinum* mass-specific productivity ($\text{mg g}^{-1} \text{d}^{-1}$) for individual sampling dates in 1996.
- Figure 36b. Contours of *Thalassia testudinum* mass-specific productivity ($\text{mg g}^{-1} \text{d}^{-1}$) for individual sampling dates in 1997.
- Figure 37a. Contours of *Thalassia testudinum* areal productivity ($\text{g m}^{-2} \text{d}^{-1}$) for individual sampling dates in 1996.
- Figure 37b. Contours of *Thalassia testudinum* areal productivity ($\text{g m}^{-2} \text{d}^{-1}$) for individual sampling dates in 1997.
- Figure 38a. Contours of *Thalassia testudinum* leaf C:N for individual sampling dates in 1996.
- Figure 38b. Contours of *Thalassia testudinum* leaf C:N for individual sampling dates in 1997.
- Figure 39a. Contours of *Thalassia testudinum* leaf C:P for individual sampling dates in 1996.
- Figure 40a. Contours of *Thalassia testudinum* leaf N:P for individual sampling dates in 1996.

Summary of Accomplishments

This report contains summary data of seagrass monitoring in the FKNMS for fiscal years 1996 and 1997, and is divided into 3 sections:

Section I: Station Locations & Work Effort

In FY1996, we reported data for 4 sampling periods at 26 Level 1 (quarterly) stations. In 1997, we installed 4 more permanent Level I stations (215, 271, 273, 276), of which data has only been recorded for stations 271 and 276. Stations 215 and 273 were installed during the 4th quarter sampling, and their coordinates are listed in Table 1 in Appendix C. Sampling dates and codes for Level 1 stations are listed below:

Date	Code
December 1995	96-1
March 1996	96-2
July 1996	96-3
September 1996	96-4
December 1996	97-1
March 1997	97-2
June 1997	97-3
September 1997	97-4

During both FY 1996 and FY 1997 summer sampling of Level 2 and Level 3 stations was conducted in May - August, and the number of sites visited each year is listed below:

	1996	1997
No. Level 2 Stations	65	87
No. Level 3 Stations	141	187
Total No. Stations	206	274

Work effort for field sampling is presented in Table 1 for quarterly and summer sampling. Station locations for all sites visited in 1996 and 1997 are shown in Figures 1 and 2, respectively. Figure 3 contains all of the stations that we have sampled during the last 2 years.

Section II: Quarterly Station Summary Data

In this section, data from quarterly sampling of Level 1 stations for 1996 and 1997 are presented on 28 figures (a-e). The degree of temporal variation is site-specific, and seasonal increases in seagrass abundance and productivity appear to be related to water depth--where shallow sites are most affected by colder temperatures during winter months. Some data sets are incomplete (e.g., leaf elemental content) because the analyses are still in progress.

Braun-Blanquet Calculations: Frequency, abundance, and density, were estimated for *Thalassia testudinum*, *Syringodium filiforme*, *Halodule wrightii*, and calcareous green algae. *Thalassia testudinum* appears to be the most stable and consistent of the seagrasses. At some sites, seasonal effects are evident (e.g. Fig 4a (site 214)) where the frequencies and abundances are higher in the 3rd and 4th quarters. At other sites (e.g. Fig 7a (site 223) and Fig 9a (site 227)), the frequency of *T. testudinum* remains constant over time, but its abundance and density reflects seasonal increases during the 3rd and 4th quarters. *Syringodium filiforme* and *Halodule wrightii* exhibit more dramatic seasonal patterns at most sites (e.g. Fig 13a (site 241)), relative to *T. testudinum*. No obvious patterns have been observed with calcareous green algae, where frequencies and densities are constant over time at some sites (e.g. Fig 4a (site 214)) and not others (e.g. Fig 16a (site 255)).

Density & Standing Crop Estimates: Short shoot density, standing crop, and leaf mass of *Thalassia testudinum* were estimated from seagrasses harvested from the 6 quadrats used in our productivity studies. Short shoot densities ranged between 66 - 1025 SS m⁻² for all sites for both years, with the highest density recorded at site 225 in 97-4. Standing crop ranged between 5 - 93 (g m⁻²), with site 241 in 96-3 exhibiting the greatest values. Leaf mass exhibited a high degree of variation, with values ranging between 21 - 415 mg SS⁻¹. The degree of seasonality for these variables was determined by plotting the fractional deviation of the seasonal mean (winter = quarter 1 (for both years), spring = quarter 2, summer = quarter 3, fall = quarter 4) from the grand mean (mean of all data points). Negative values of standardized residuals were generally observed in the winter, and positive values were observed in the summer. Standardized residuals in the spring and fall did not exhibit any generalized patterns.

Productivity: Productivity of *Thalassia testudinum* was calculated on a short shoot (SS), mass-specific (MS), and areal basis. Standardized residuals were also plotted to determine the degree of seasonality. Short shoot productivity ranged between 0.18 - 8.31 mg SS⁻¹ d⁻¹, with higher values recorded for seagrasses in Florida Bay (FKNMS segments 4 and 6) relative to seagrasses on the ocean-side (FKNMS segments 5, 7, and 9). Mass-specific productivity ranged between 3.21 - 49.47 mg g⁻¹ d⁻¹, with the highest value recorded at site 271 in 97-3. Areal productivity ranged between 0.07 - 3.37 g m⁻². Strong seasonal patterns were observed for all three measures of productivity, especially for shallower sites in Florida Bay; where high, negative residuals were calculated for winter and spring, and high positive residuals were calculated for summer and fall.

Leaf C:N:P Ratios: Carbon and nitrogen contents of all quarterly samples collected through 97-3 have been analyzed for this report. The nature of the laboratory analyses for phosphorus content has allowed the inclusion of P data for the sampling events through 96-4; the rest of the P samples will be analyzed by January 15, 1998. The elemental content of the leaves of *Thalassia testudinum* from the FKNMS varied greatly in the FKNMS. In fact, 95% of the total range in published seagrass nitrogen and phosphorus contents from all seagrasses from around the world was found within samples of *T. testudinum* from the Sanctuary. The C:N ratio ranged

from 15.6 to 38.6, with a grand mean of 23.1. These values indicate that, on average, there is sufficient N available to support the growth of *T. testudinum* in the Sanctuary. C:N was generally higher in summer-fall than in winter-spring (e.g. Fig 11e (site 237)), which reflects the role of seagrass growth rate in determining N demand, and therefore N availability in the environment. C:P ratios varied from 41 to 1823. The grand mean of all samples processed to date was 860, which indicated the important role that P availability had in determining seagrass distribution in the FKNMS.

Section III: Spatiotemporal Patterns in the FKNMS

Figures 32 - 40 consist of contour maps from each of the individual sampling periods for FY 1996 and 1997. Contours were created using a kriging algorithm, based on the means of the response variables at each of the sites sampled. Contour maps provide a useful tool to determine patterns in both space and time. Contours are color-coded from light blue to red, as the values of the response variables increases. Short shoot density and standing crop exhibited intra- and inter-annual variation in the FKNMS (Figures 32a,b and 33a,b). Leaf mass and short shoot productivity, in Bay-side sites, appears to have decreased from 1996 to 1997, whereas other areas do not appear to exhibit any noticeable changes (Figures 34a,b and 35a,b, respectively). Seasonal and inter-annual patterns can also be observed in the other variables measured (Figures 36-40), but because only 2 years of data have been collected, it would be difficult to make any conclusive statements regarding temporal trends in our data sets.

Section I: Station Locations & Work Effort



Figure 1. Locations of sites sampled in 1996 (May - August) in the FKNMS. Level I sites (which are sampled on a quarterly basis) are red; Level II sites are colored green; and Level III sites are colored blue.



Figure 2. Locations of sites sampled in 1997 (May - August) in the FKNMS. Level I sites (which are sampled on a quarterly basis) are red; Level II sites are colored green; and Level III sites are colored blue.



Figure 3. Locations of sites sampled in 1996 and 1997 (May - August) in the FKNMS. Level I sites (which are sampled on a quarterly basis) are red; sites sampled in 1996 are colored purple; and sites sampled in 1997 are colored dark green.

Table 1. Field sampling effort for summer and quarterly collections for FY 1997.

	No. Persons	No. Work Hours Per Person	Work Hours	No. Dives (Sites)	No. Divers	No. Dives	Mean Dive Time (min)	Dive Time (min)	Cumulative Dive Time (min)
Summer Sampling (Level 2 & 3 Sites)									
May 1997	3	144	432	146	2	292	21.0	3015	6030
June 1997	3	33	99	30	2	60	22.6	675	1350
July 1997	3 or 4	63	218	60	2	120	21.0	1230	2460
August 1997	3	41	123	37	2	74	17.7	660	1320
September 1997	3	5	15	3	2	6	15.0	45	90
Total Sampling Effort	NA	NA	887	276	NA	552	Grand Mean 20.5	NA	11250
Quarterly Sampling (Level 1 Sites)									
97-1	NA	NA	279	28	NA	134	29	NA	3819
97-2	NA	NA	274	28	NA	112	37	NA	4022
97-3	NA	NA	285	28	NA	112	40	NA	4499
97-4	NA	NA	300	30	NA	123	38.4	NA	4752

Section II: Quarterly Station Summary Data

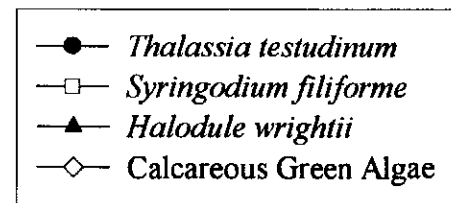
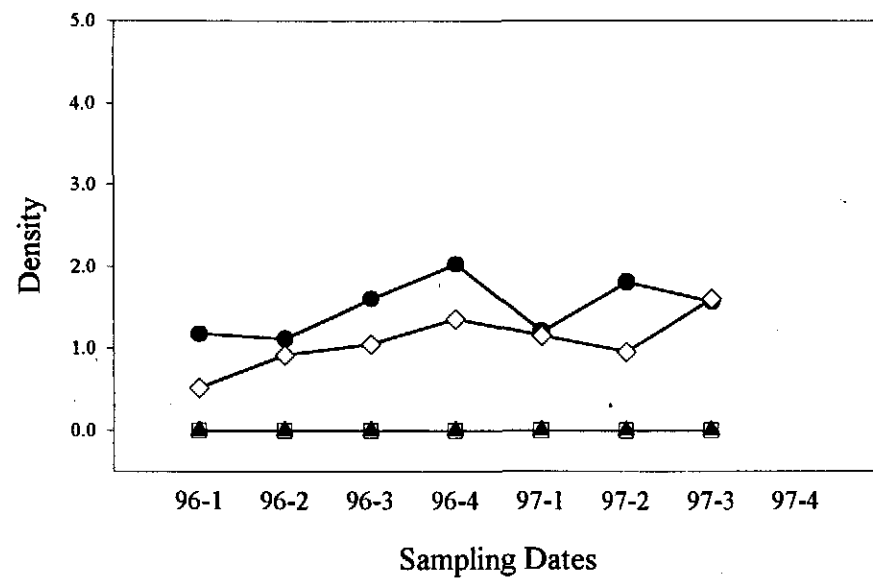
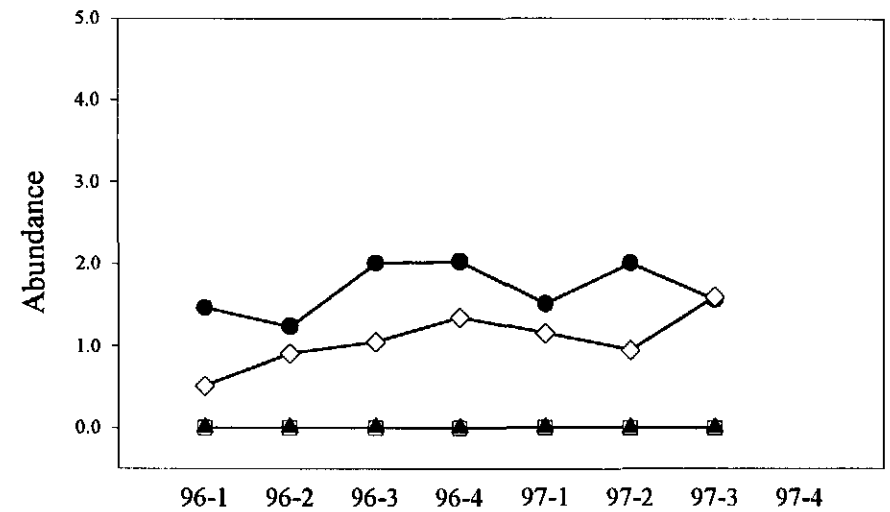
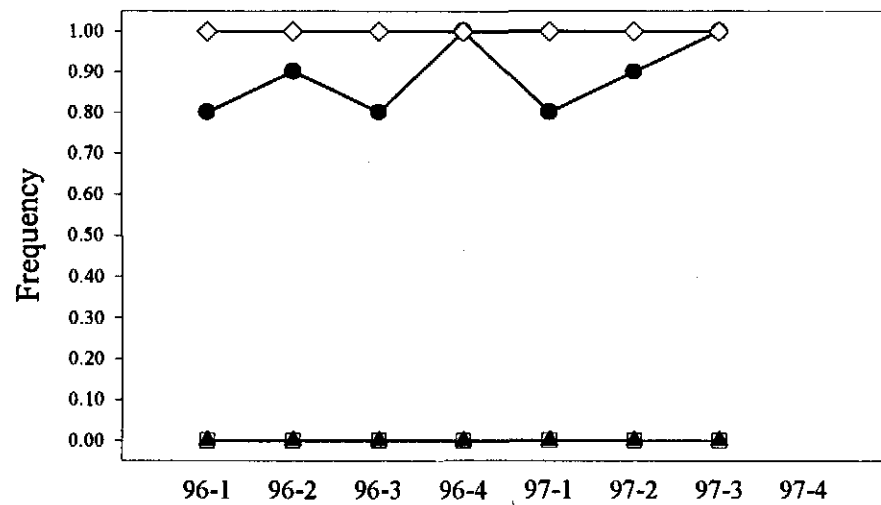
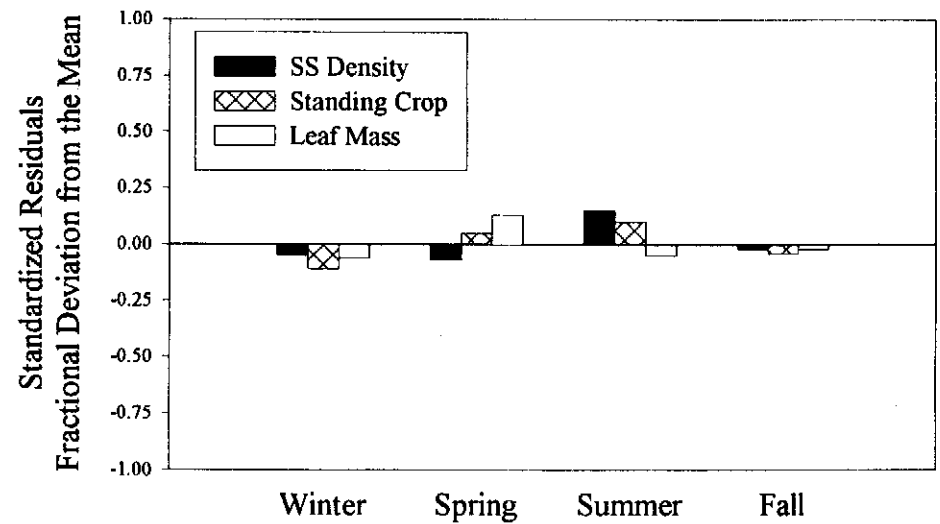
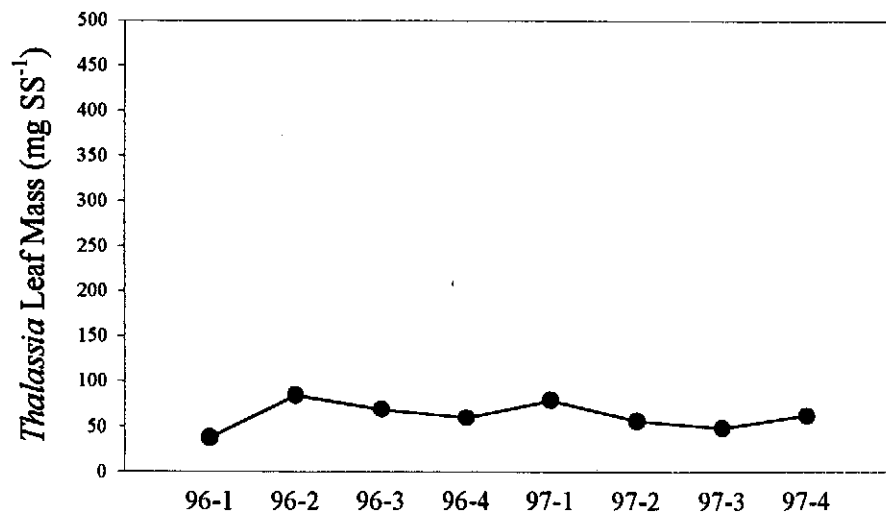
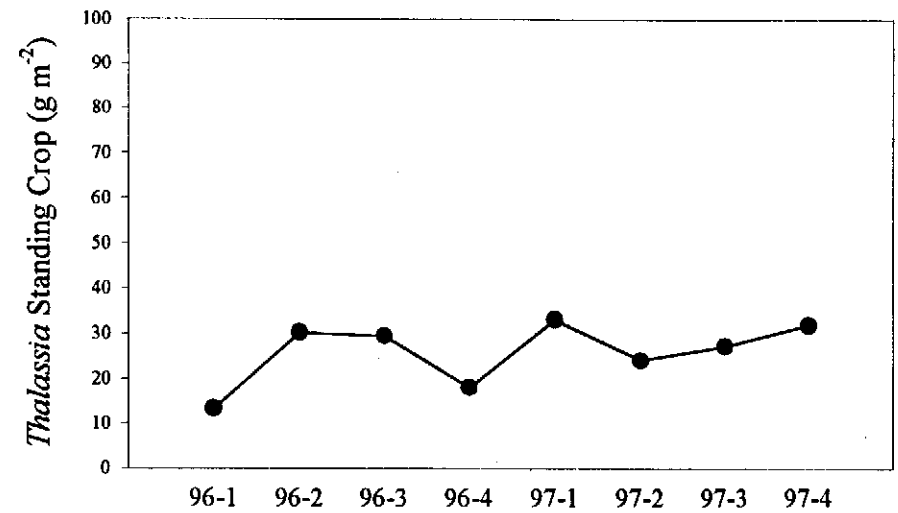
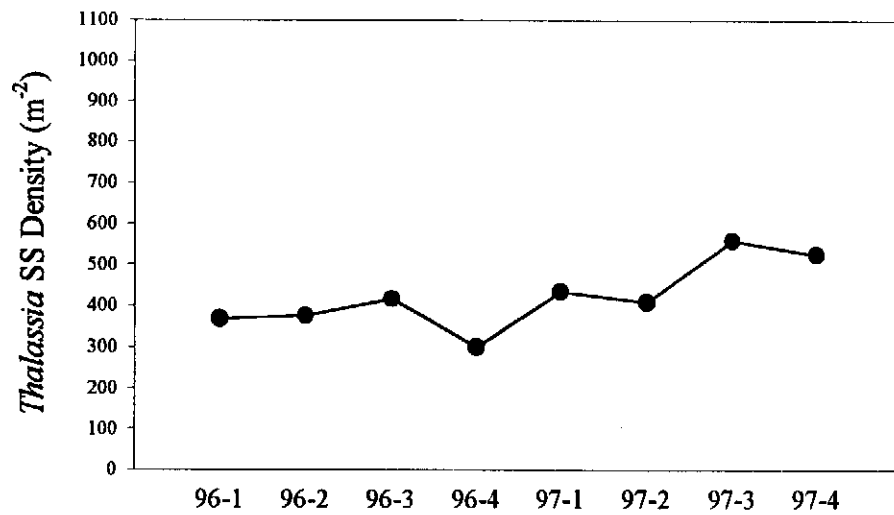
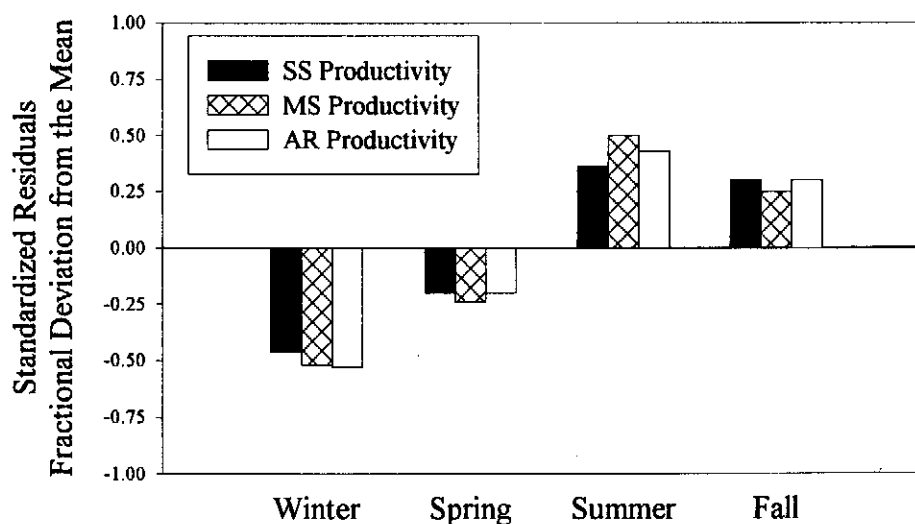
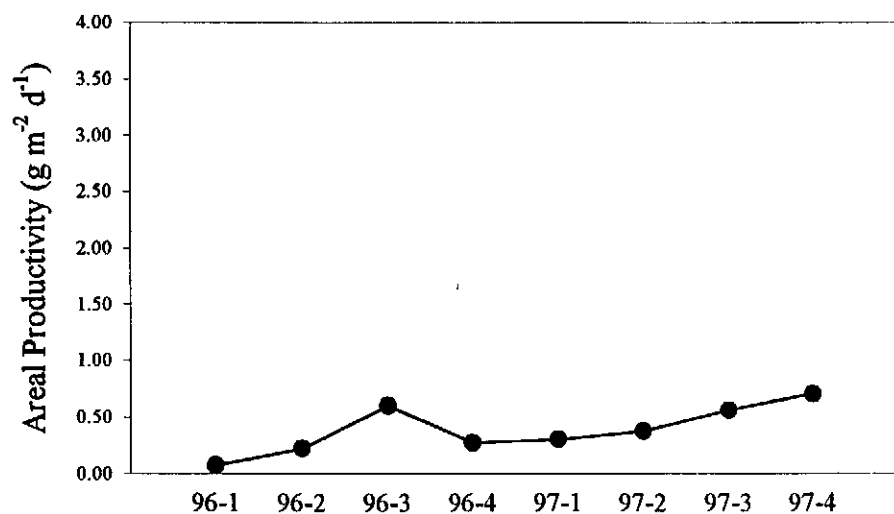
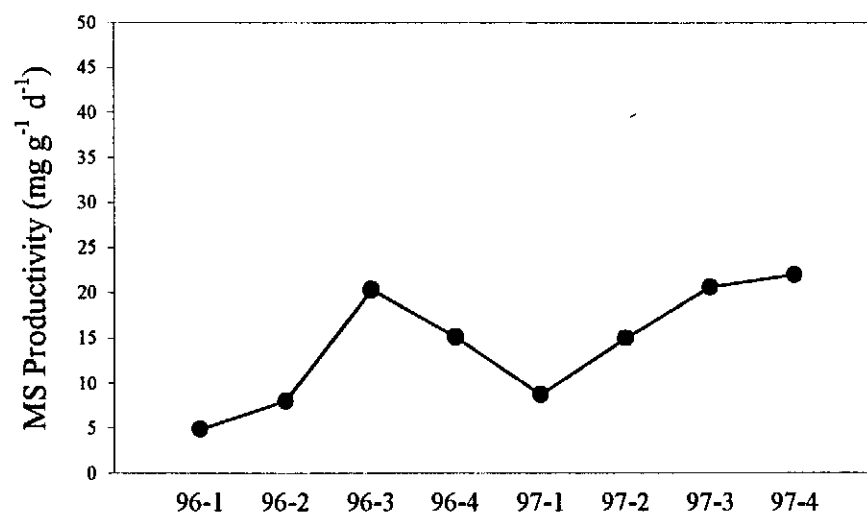
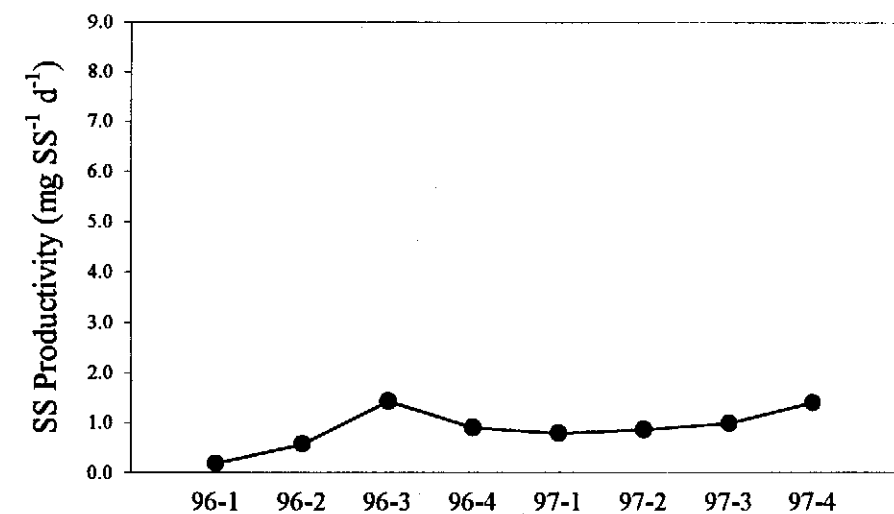


Figure 4a. Site 214. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



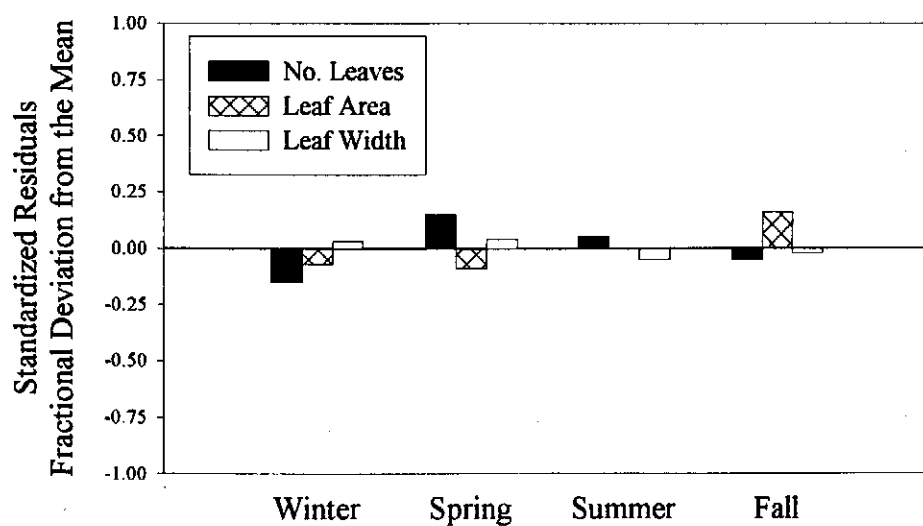
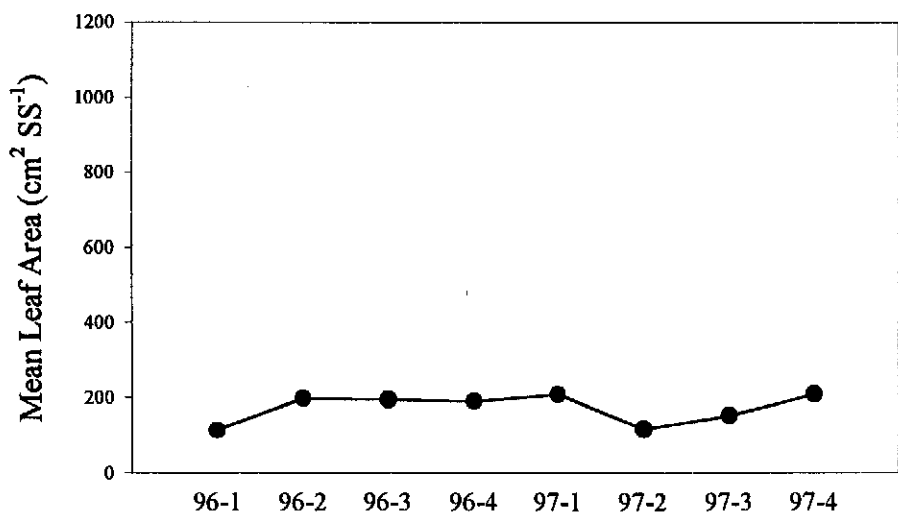
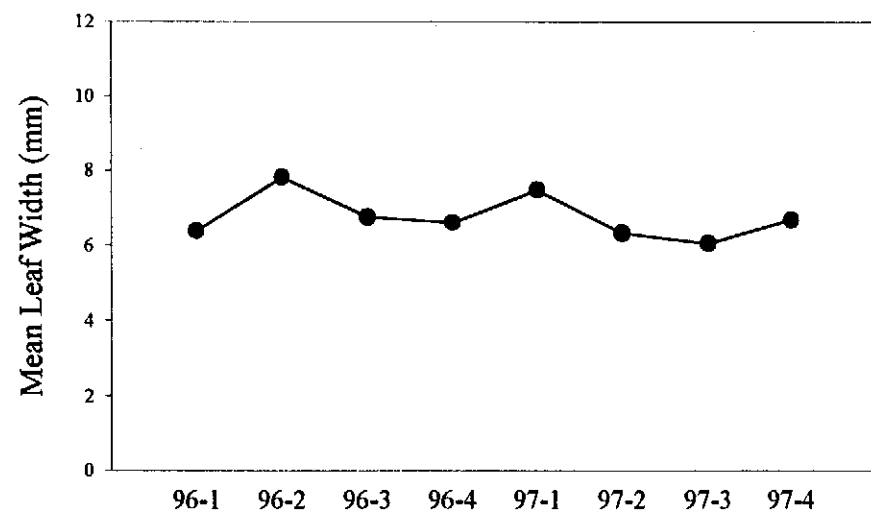
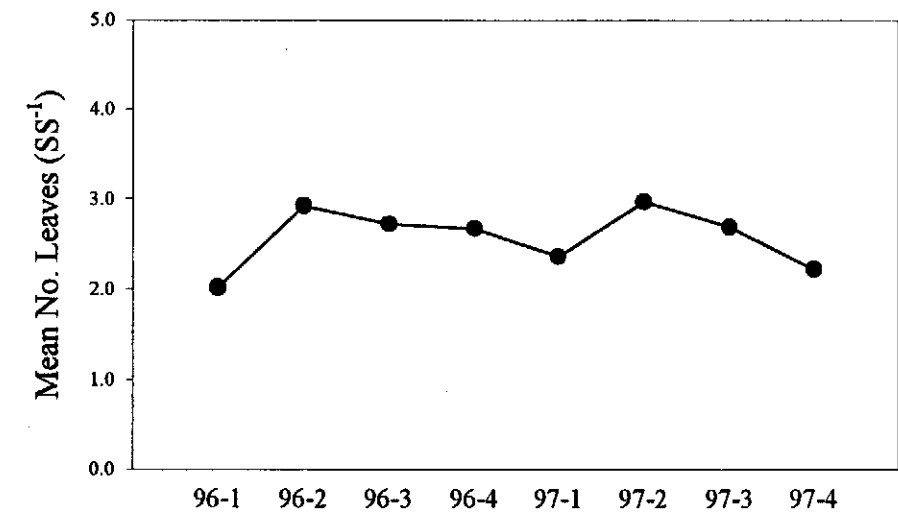
Sampling Dates

Figure 4b. Site 214. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



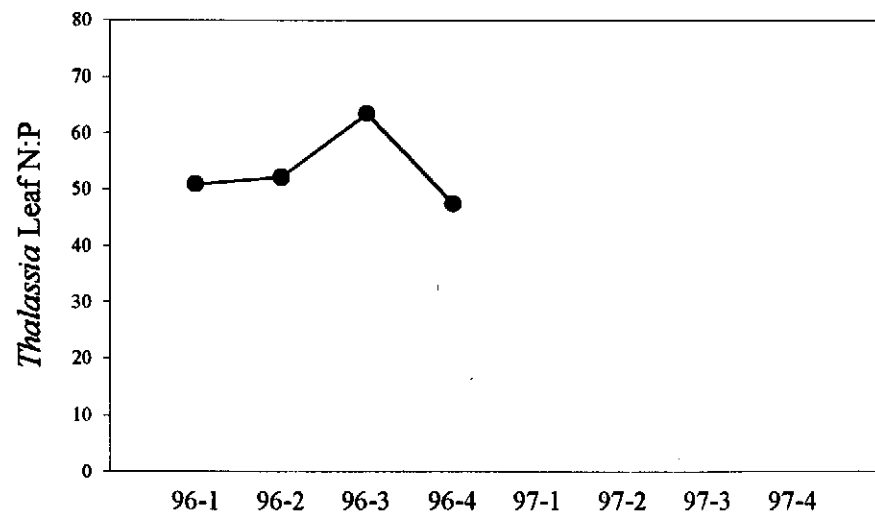
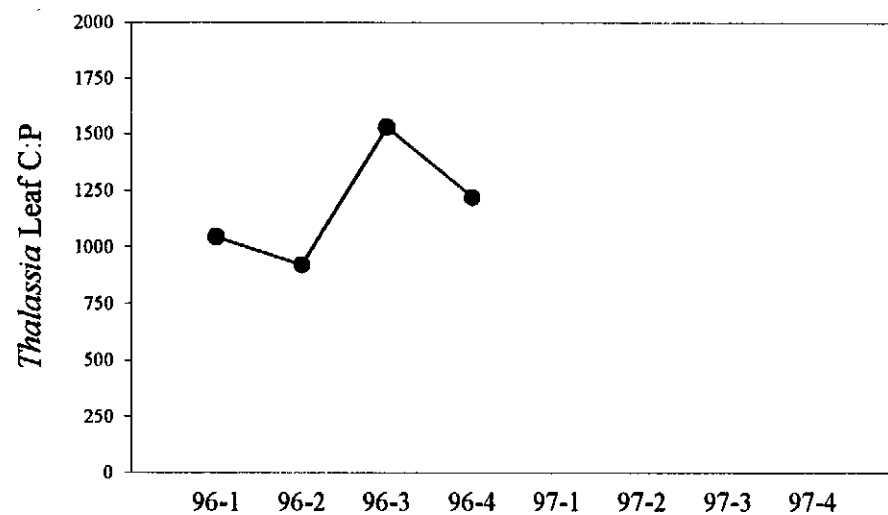
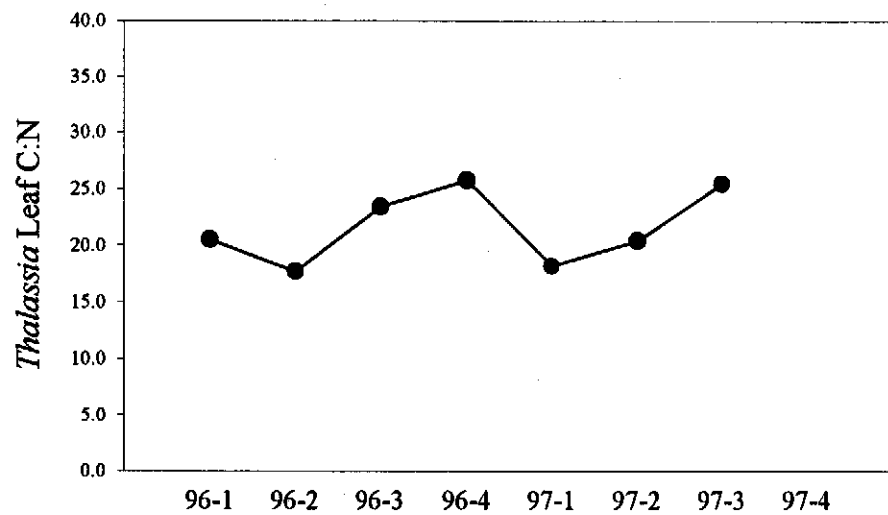
Sampling Dates

Figure 4c. Site 214. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 4d. Site 214. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 4e. Site 214. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

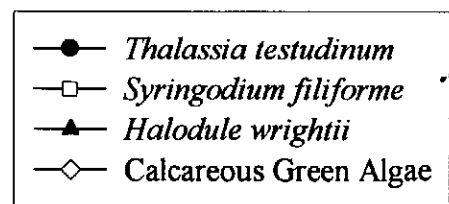
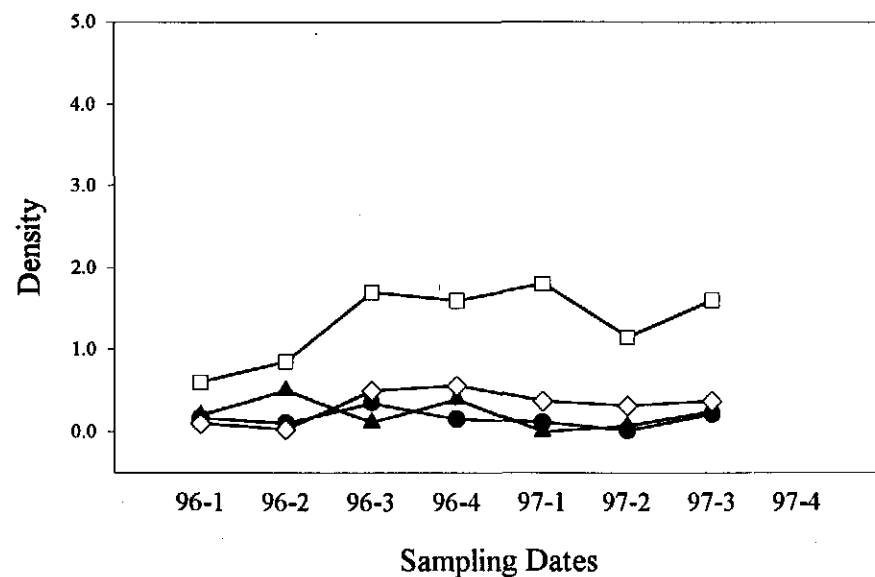
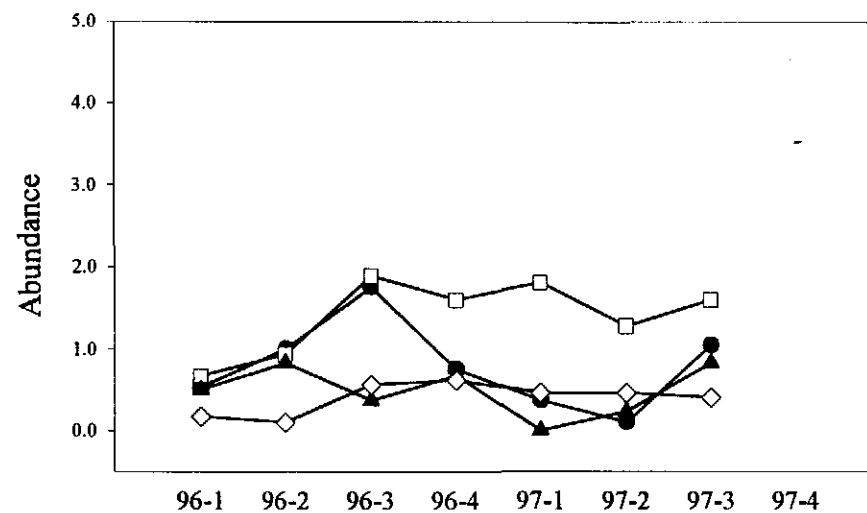
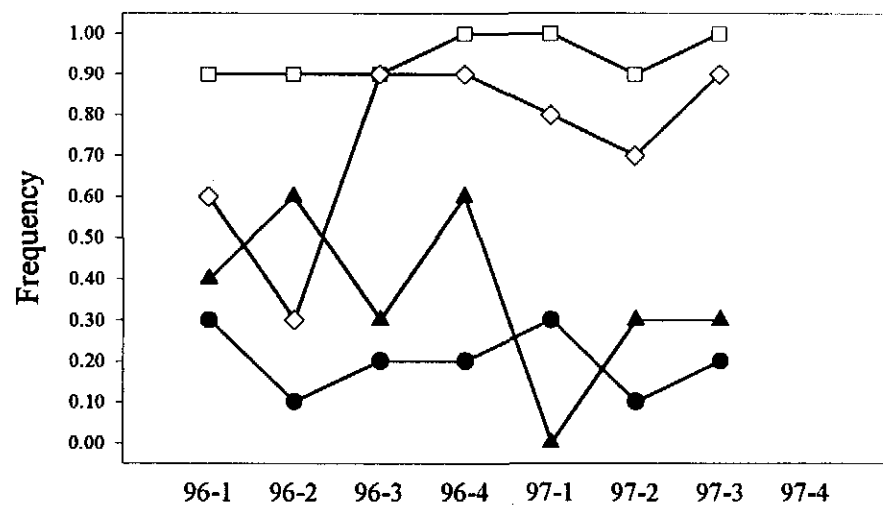
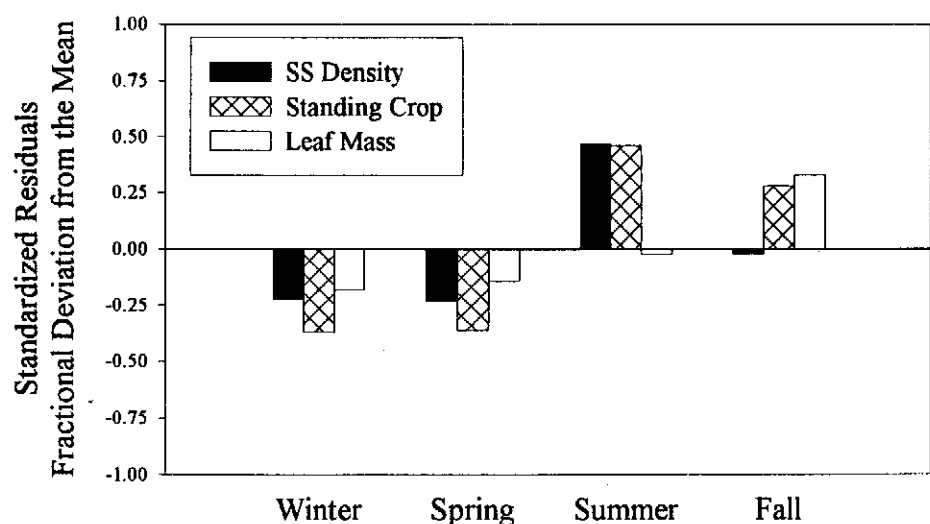
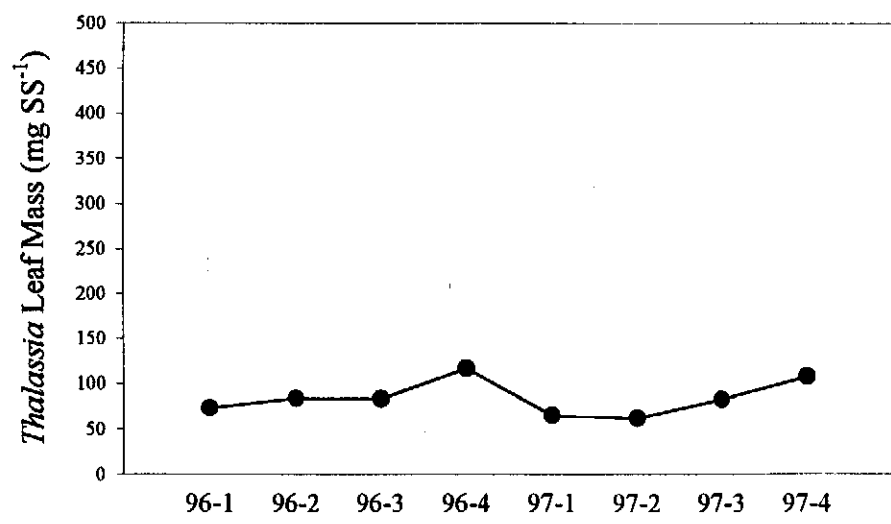
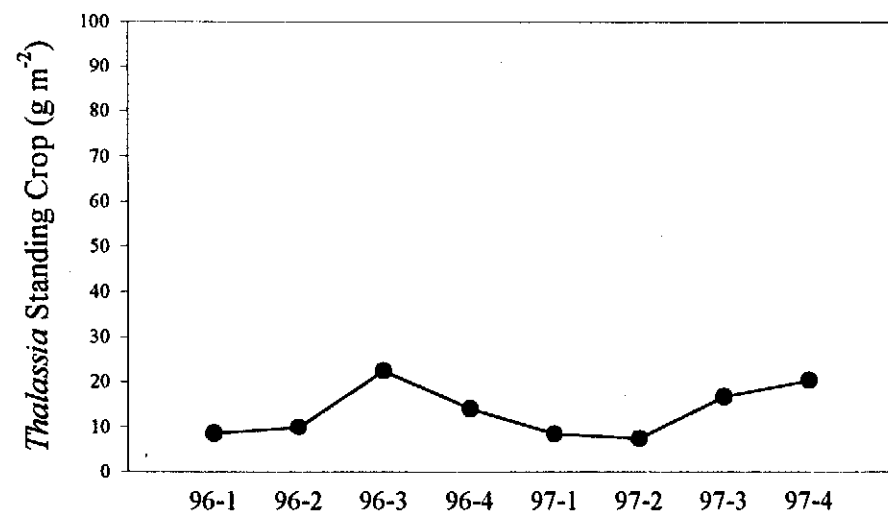
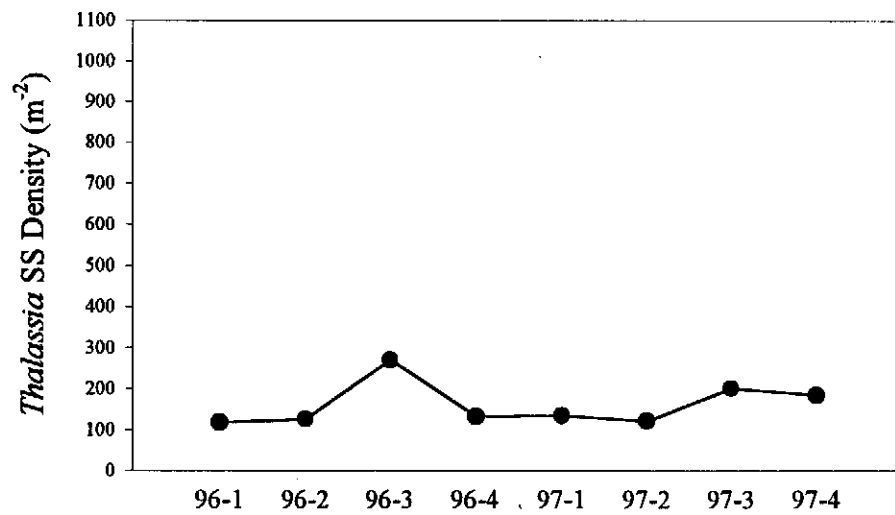
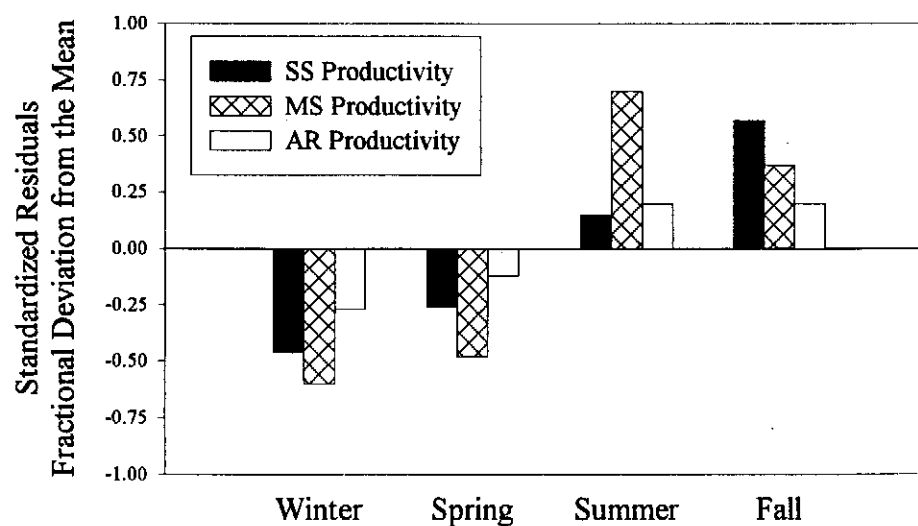
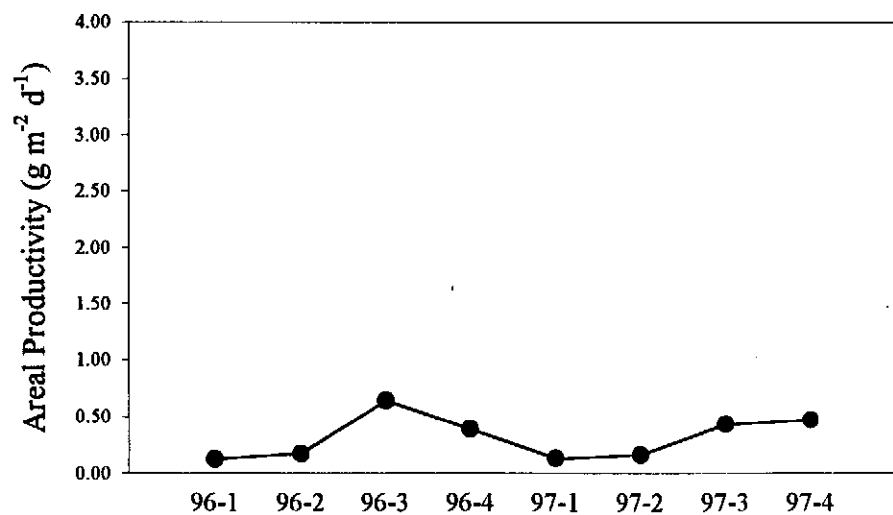
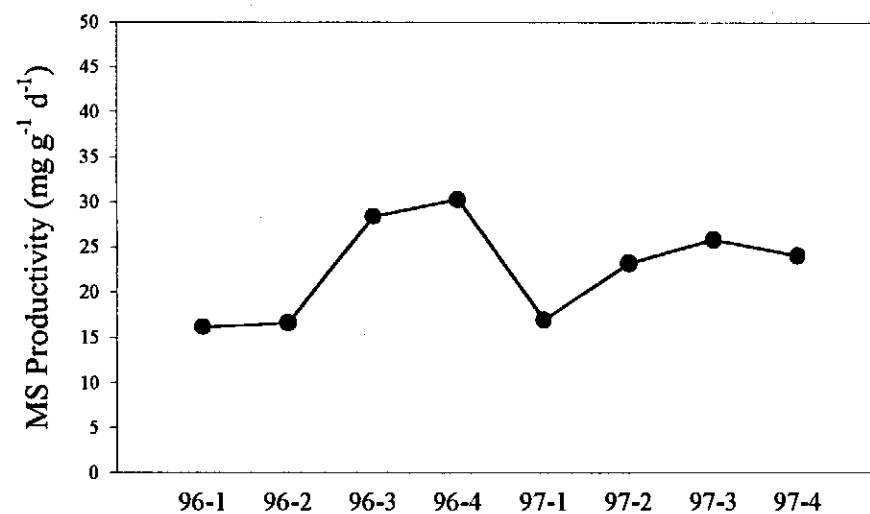
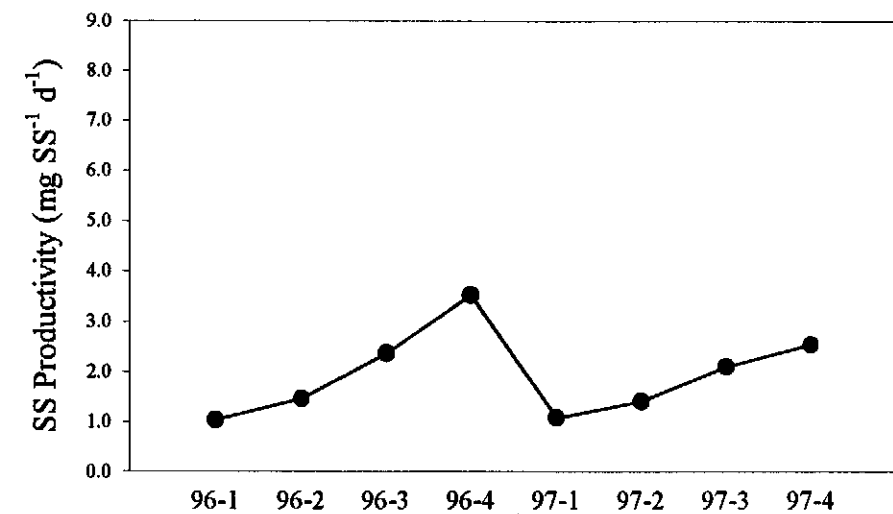


Figure 5a. Site 216. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 5b. Site 216. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 5c. Site 216. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

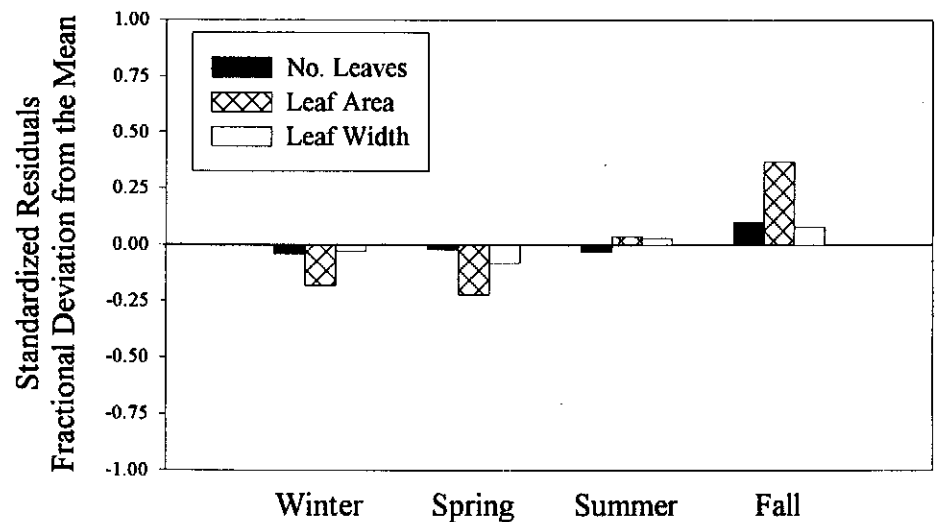
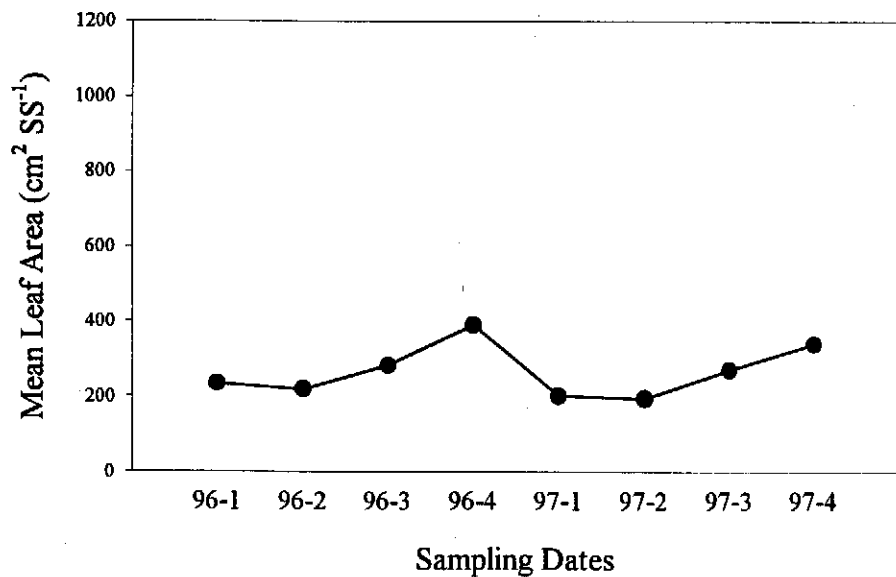
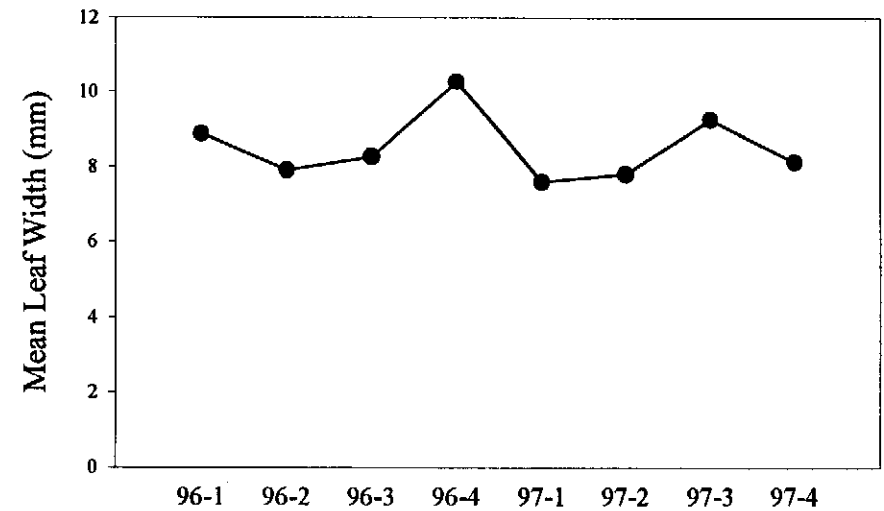
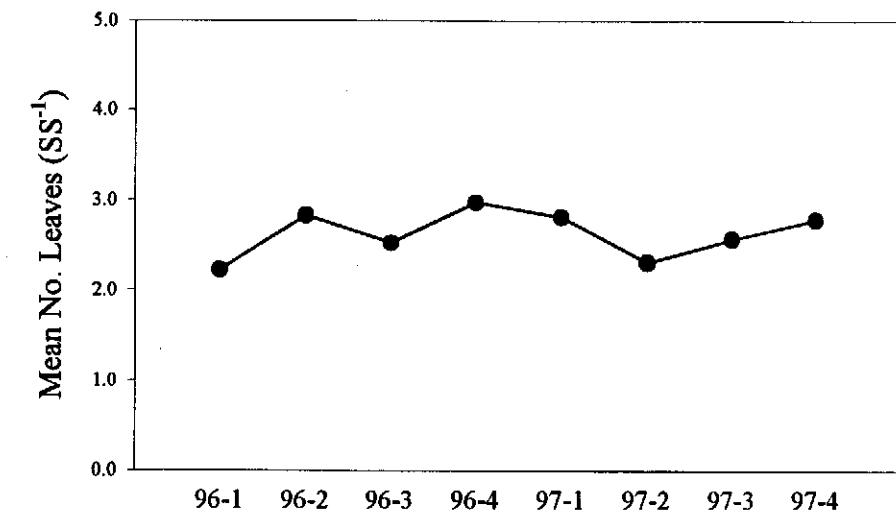


Figure 5d. Site 216. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

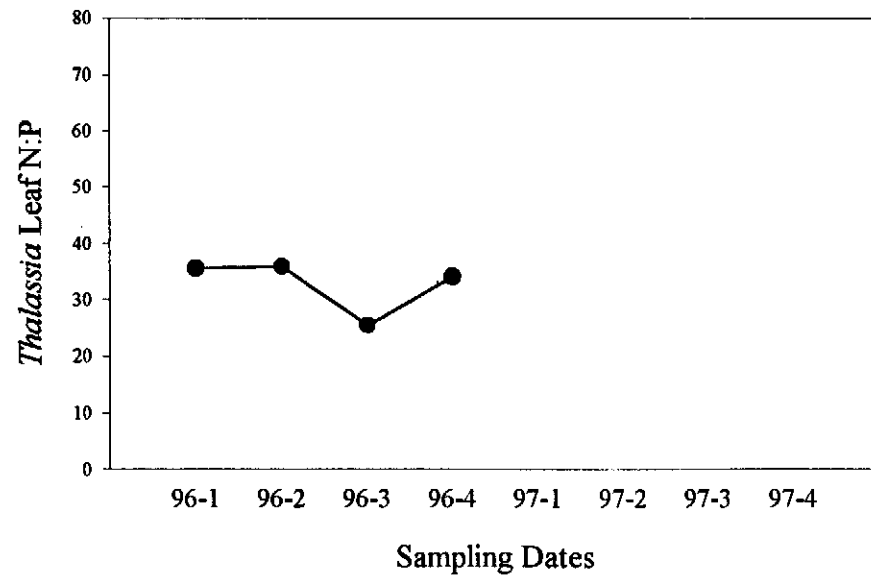
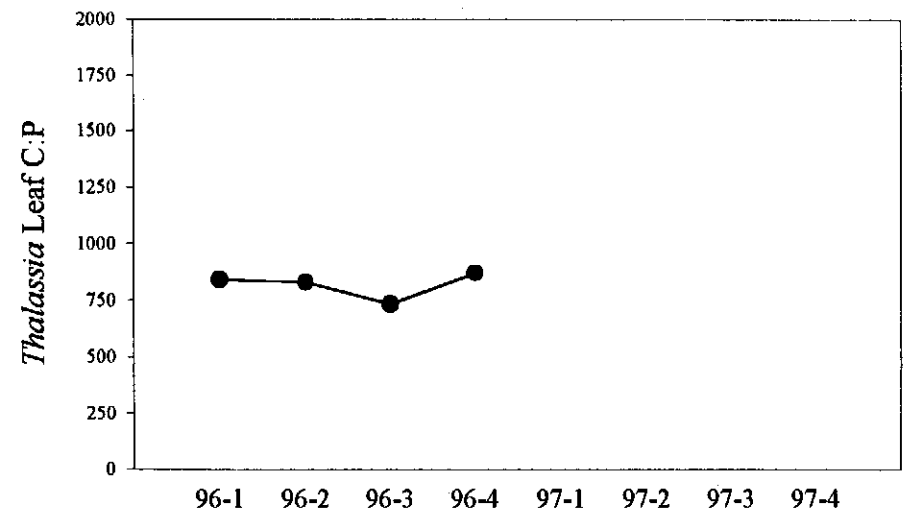
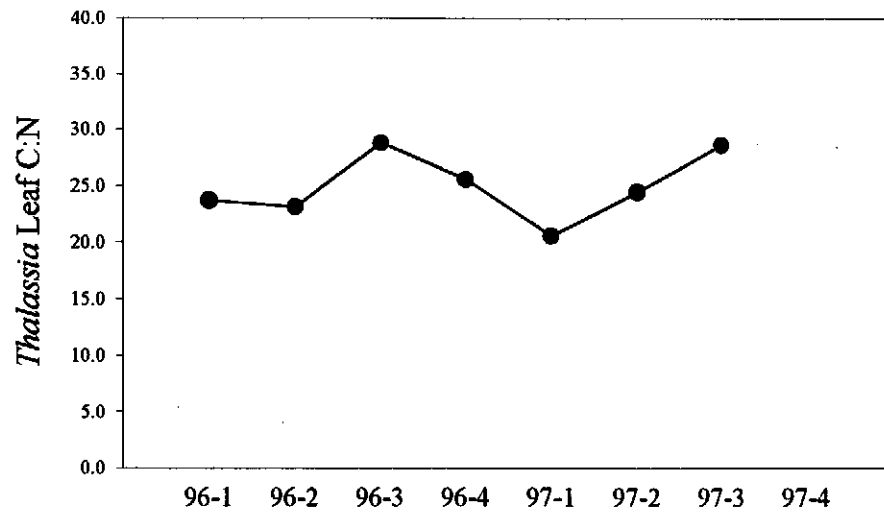


Figure 5e. Site 216. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

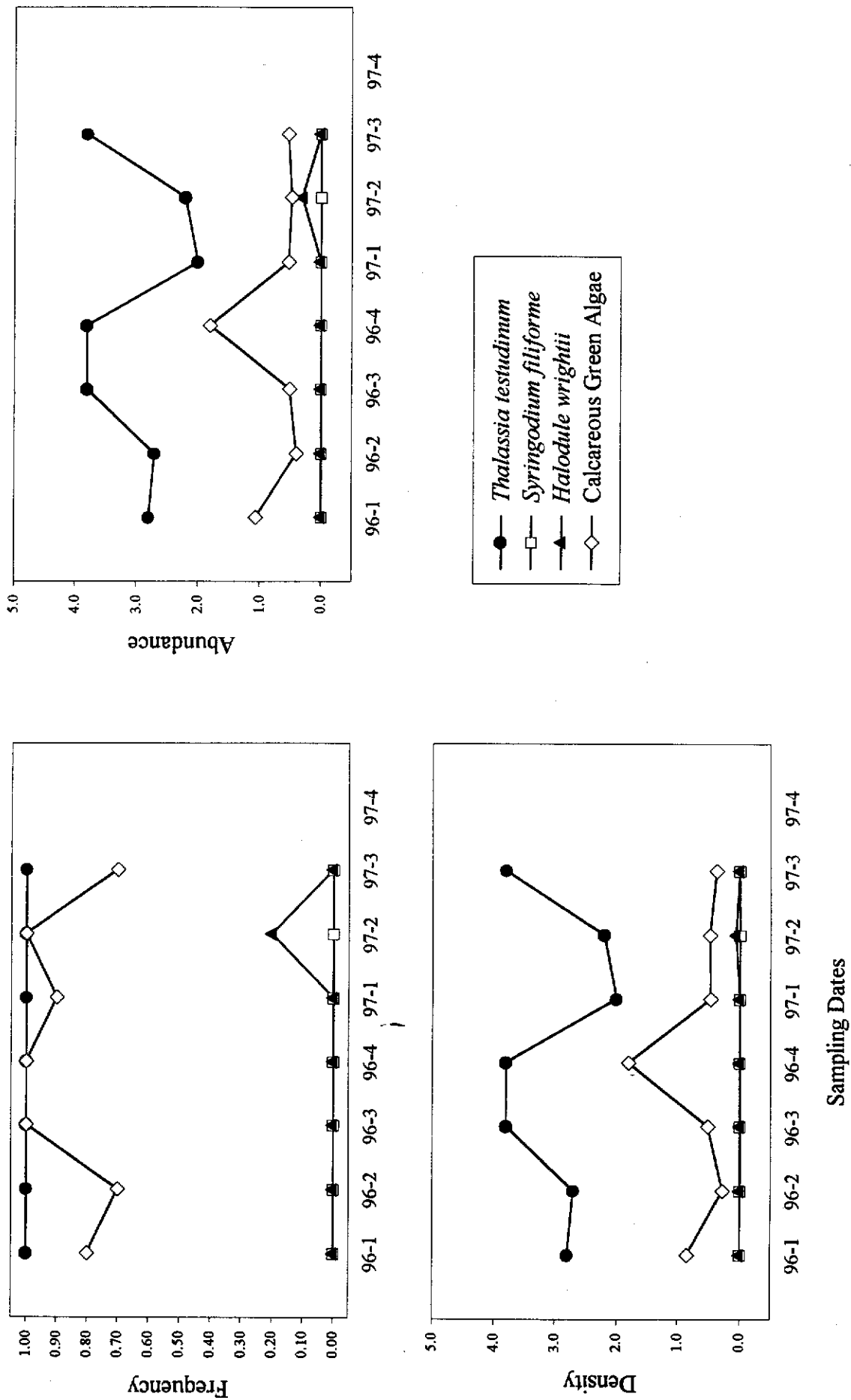
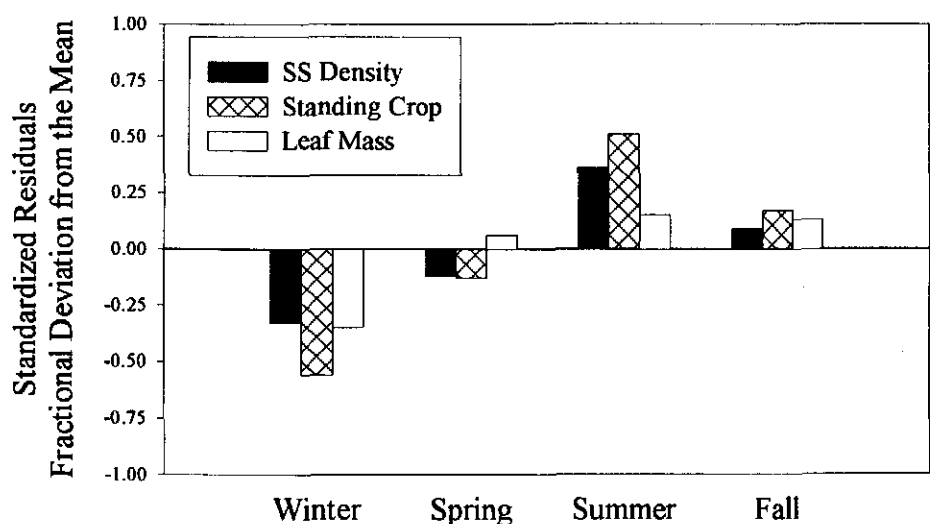
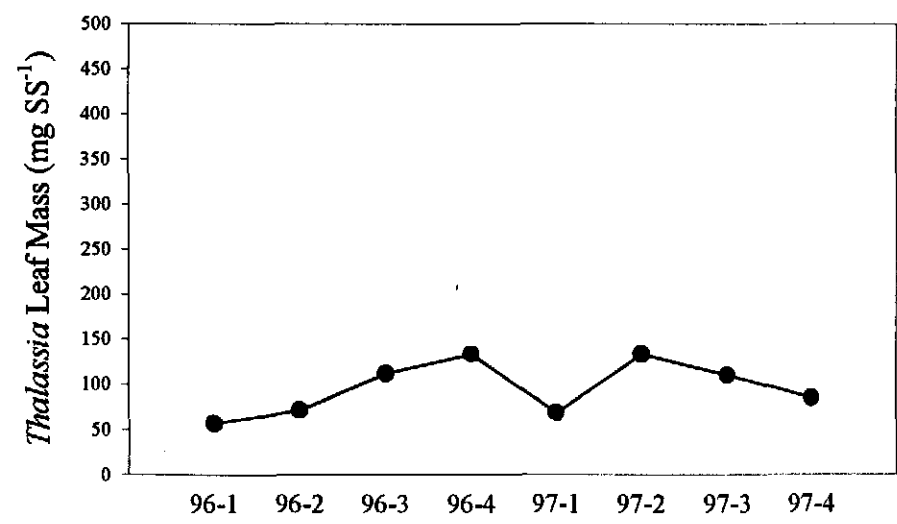
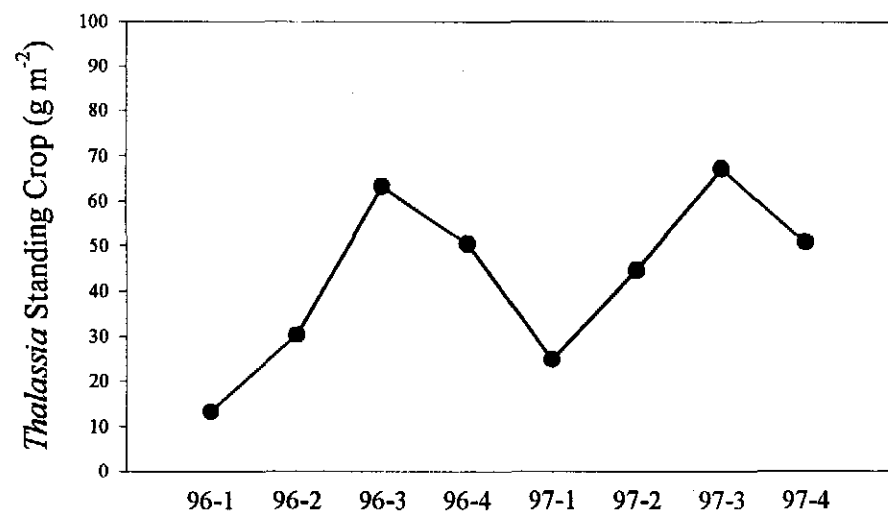
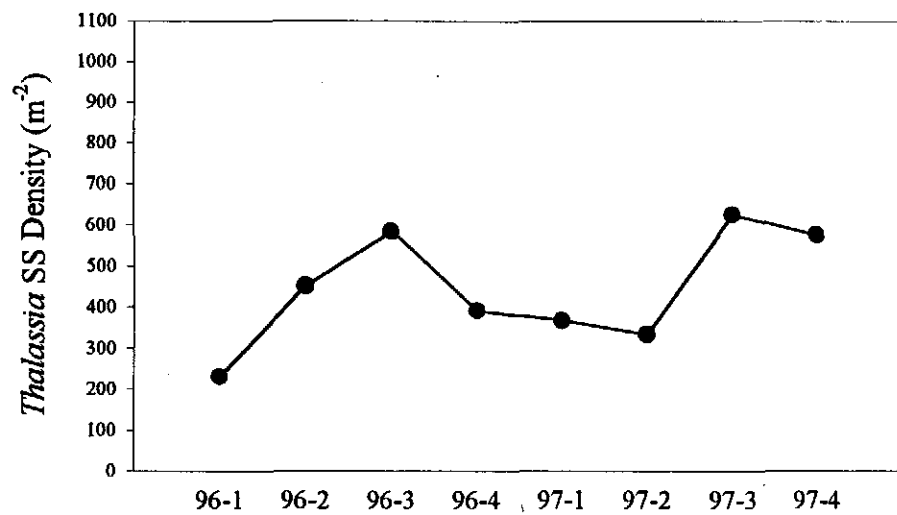


Figure 6a. Site 220. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 6b. Site 220. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

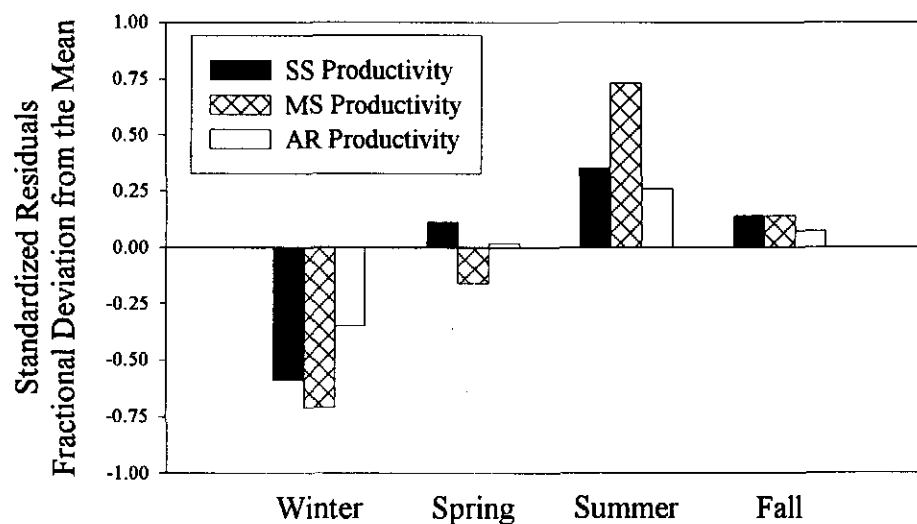
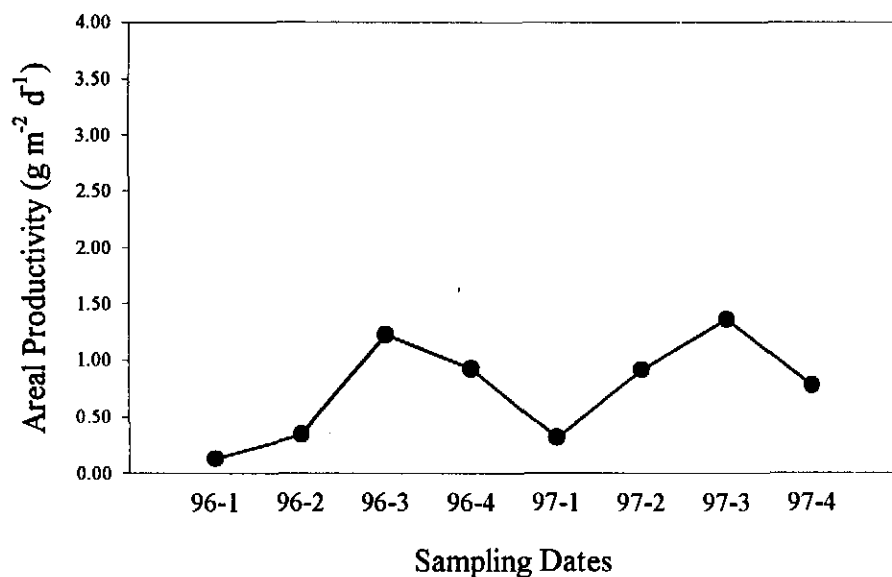
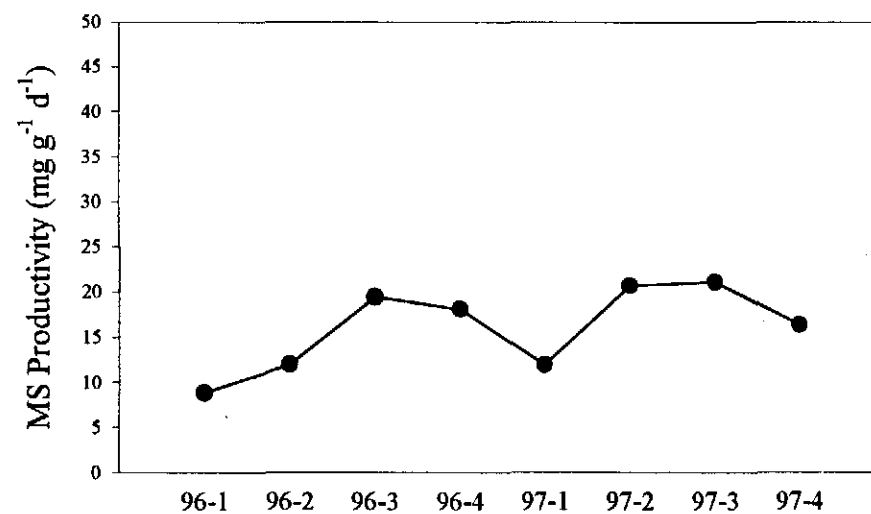
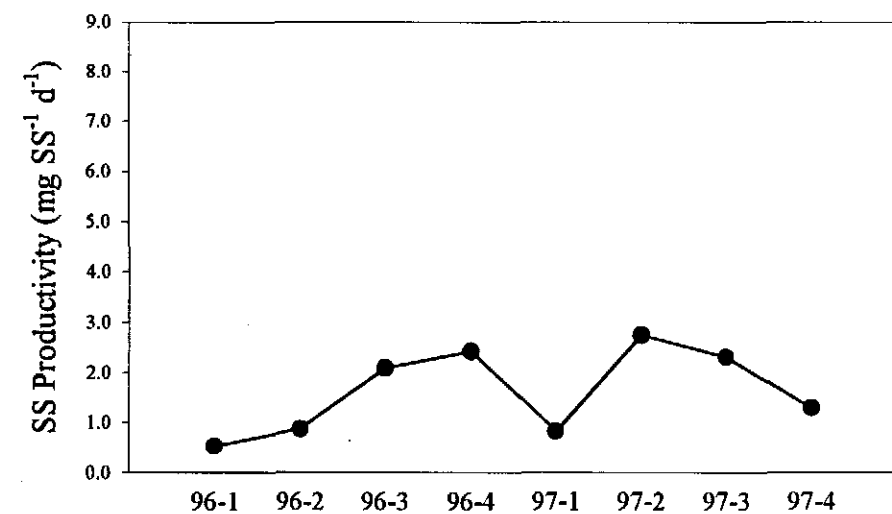


Figure 6c. Site 220. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

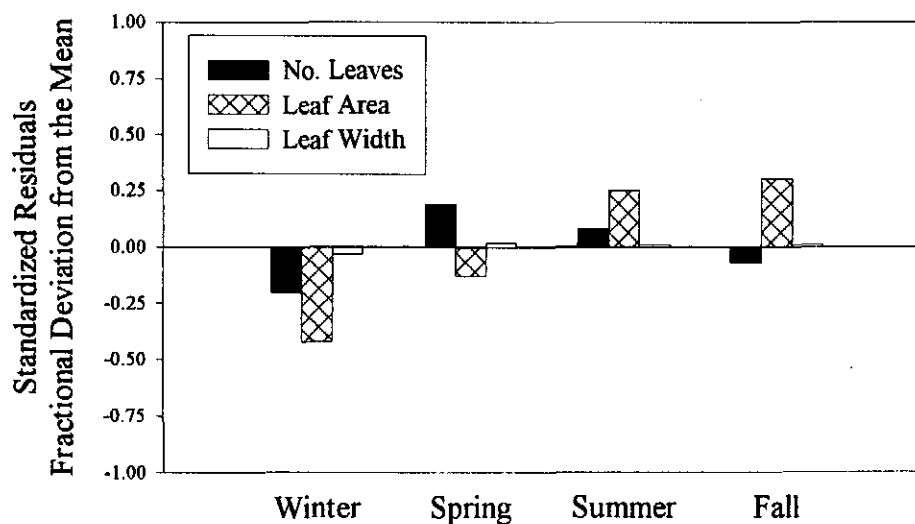
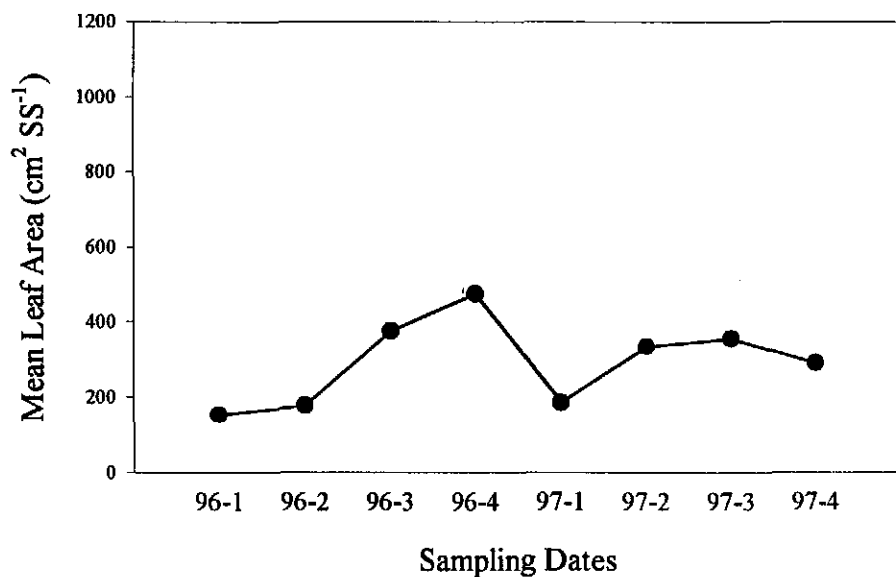
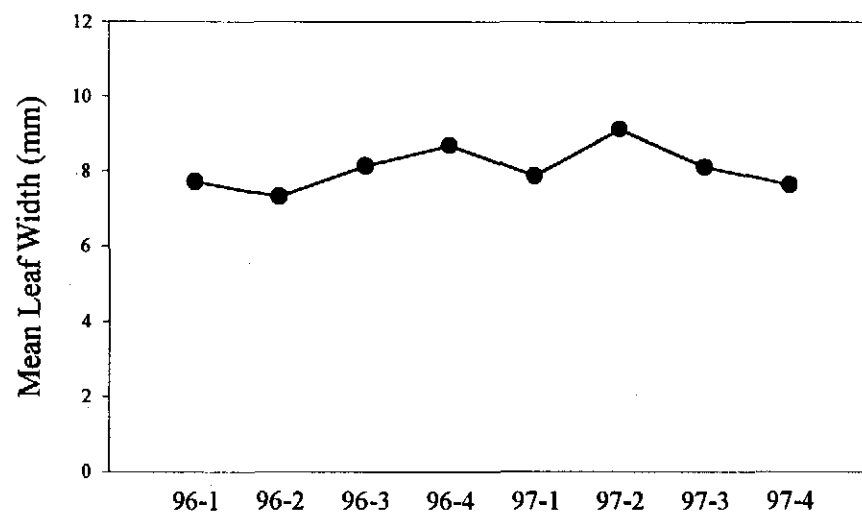
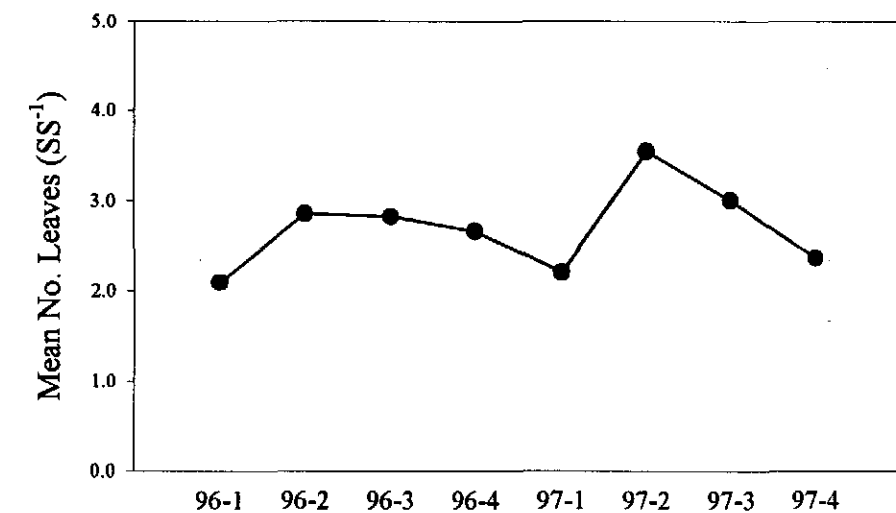


Figure 6d. Site 220. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

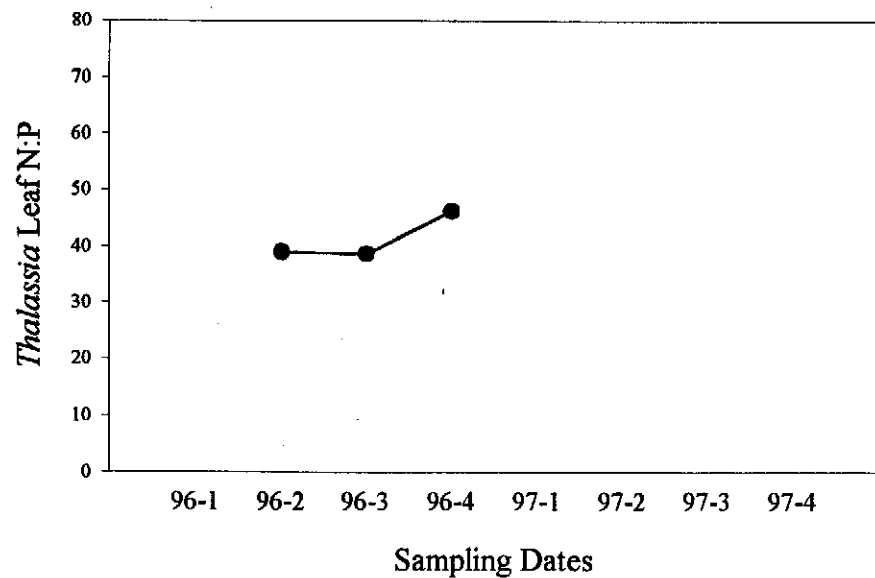
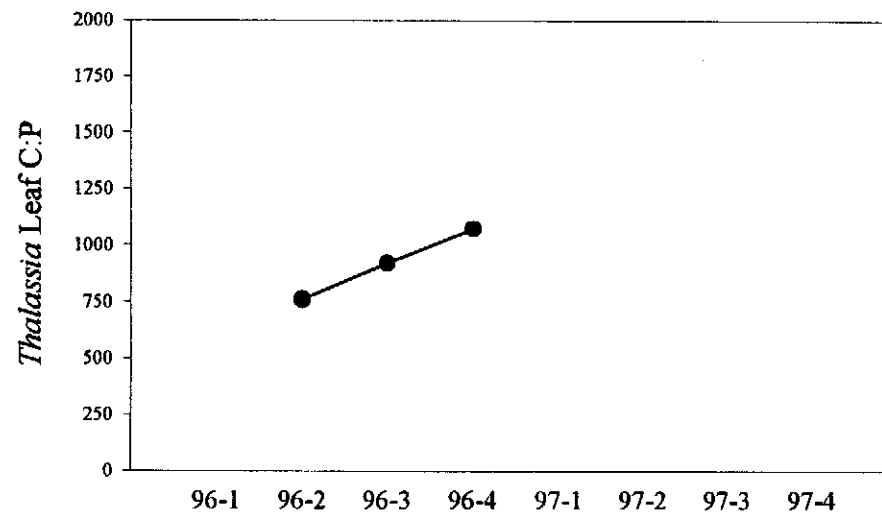
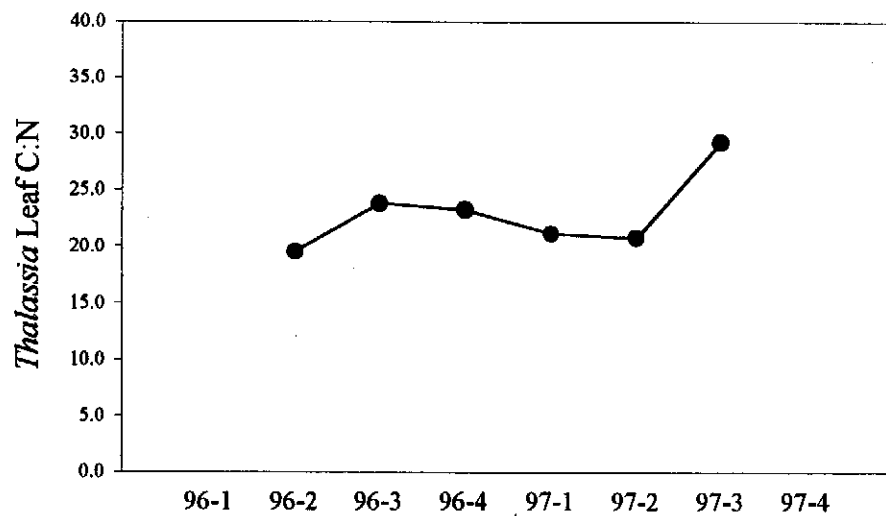


Figure 6e. Site 220. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

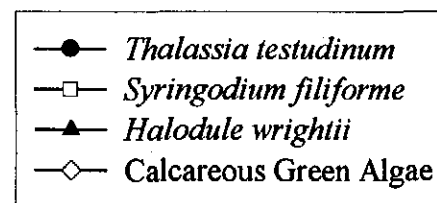
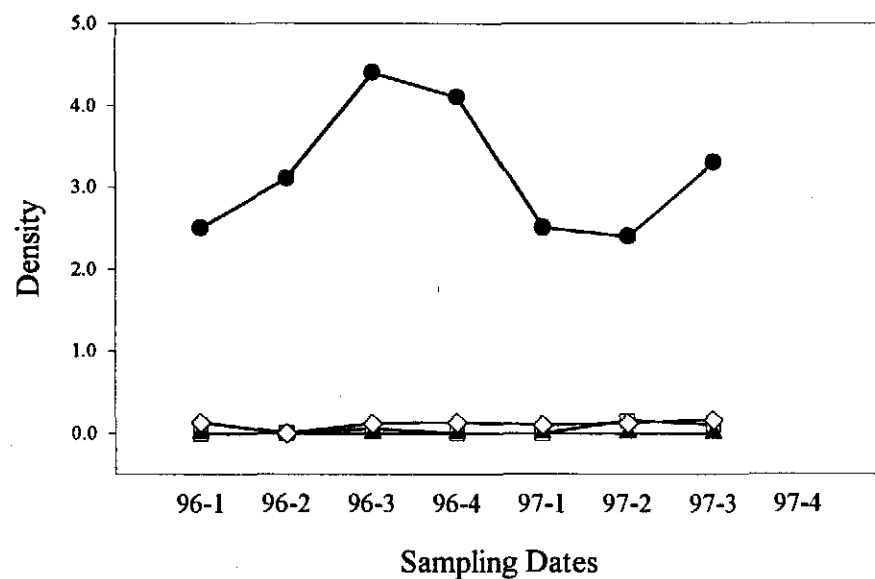
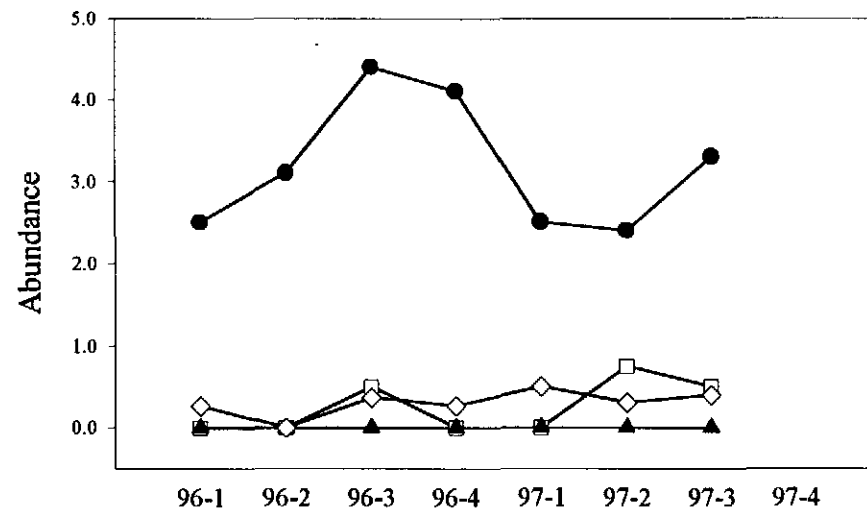
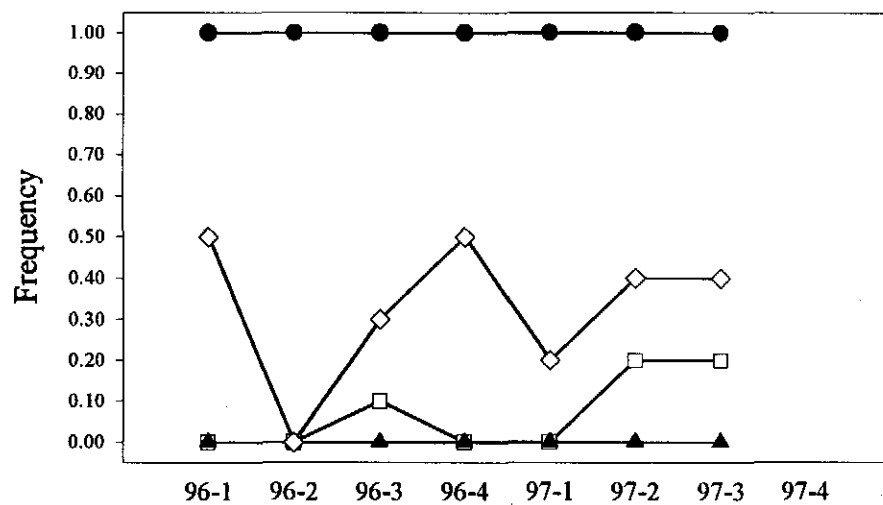
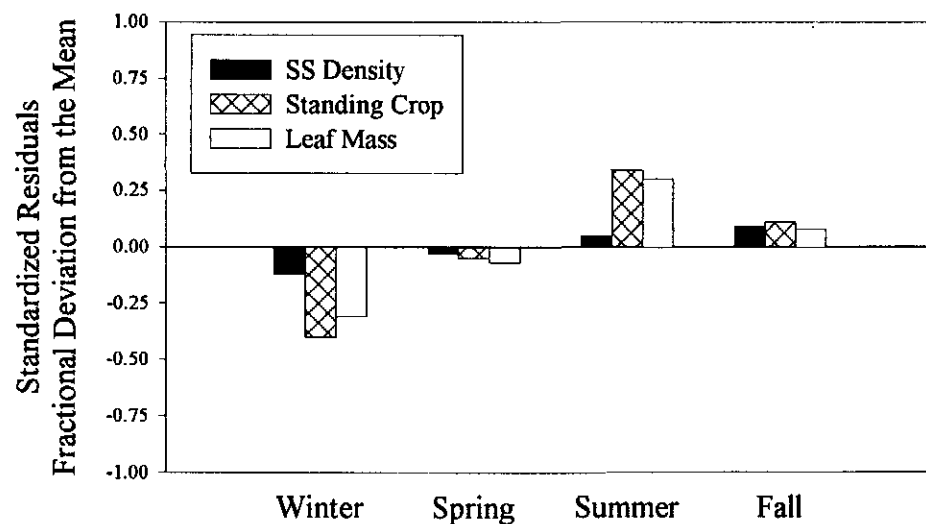
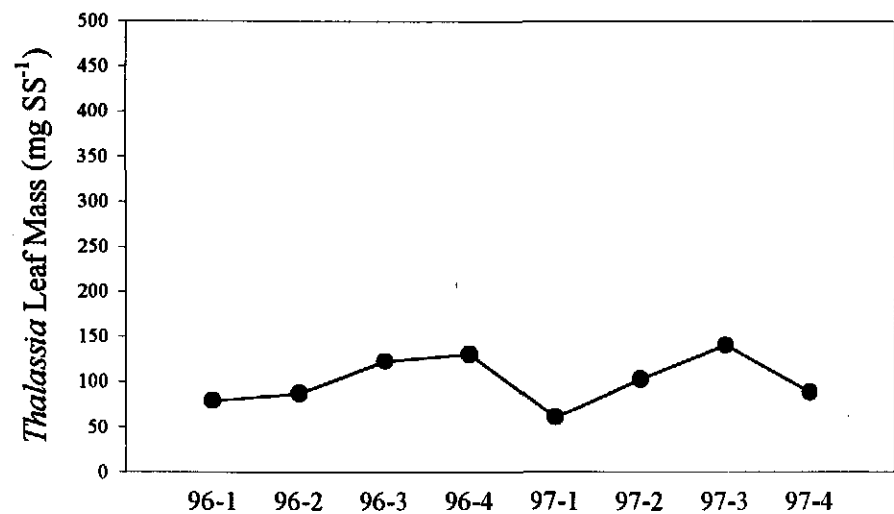
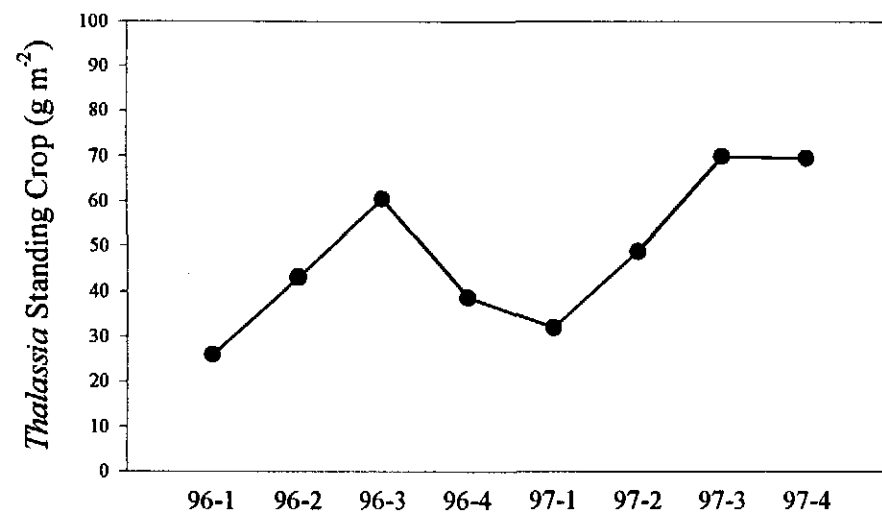
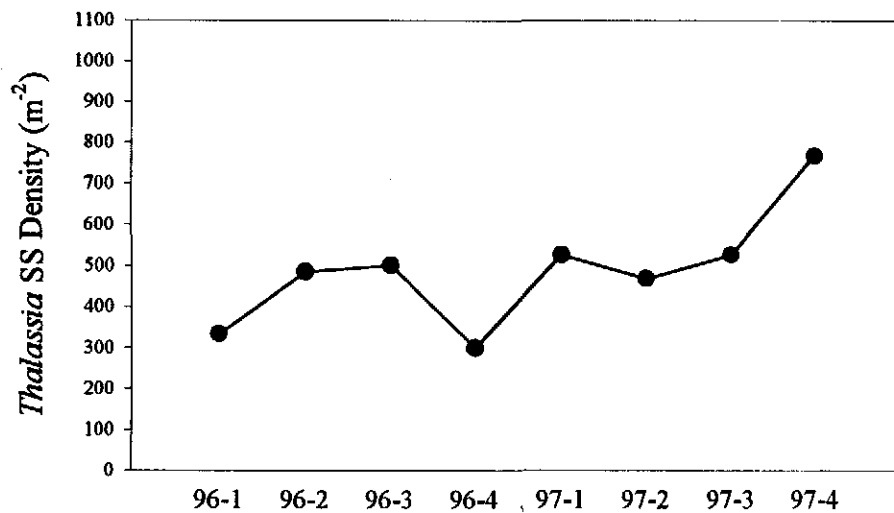
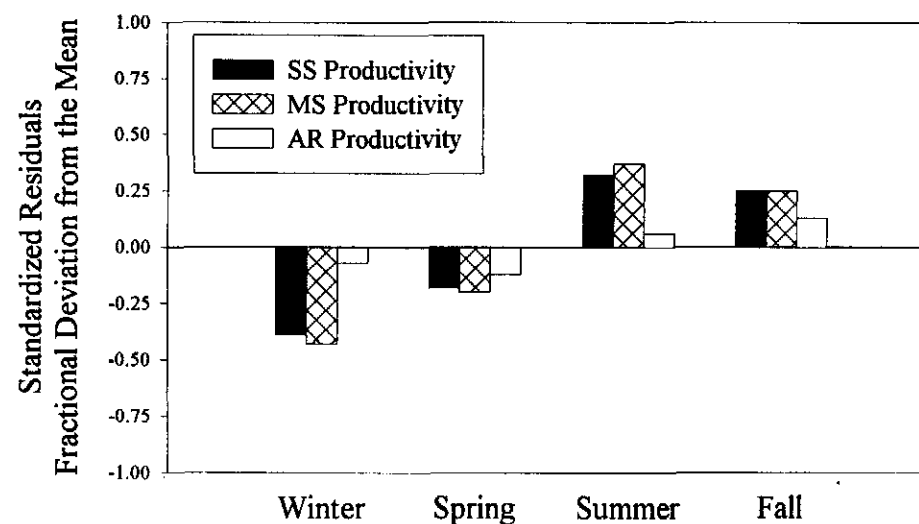
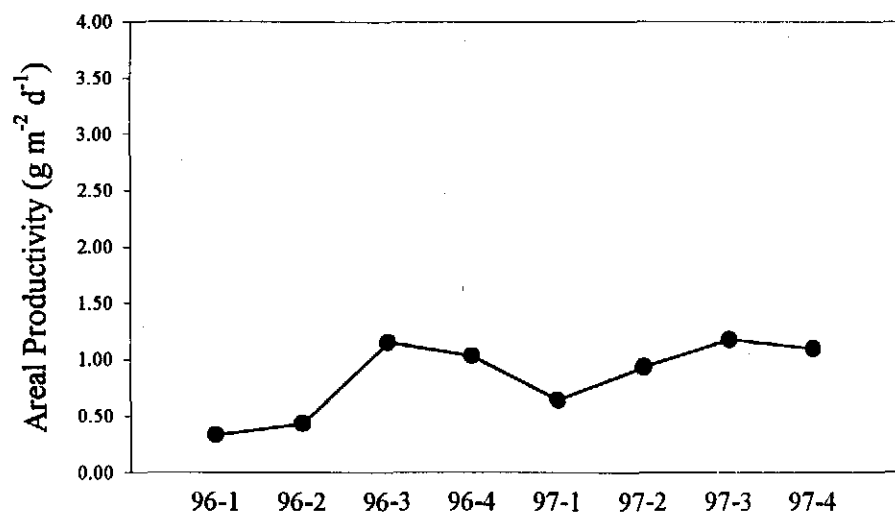
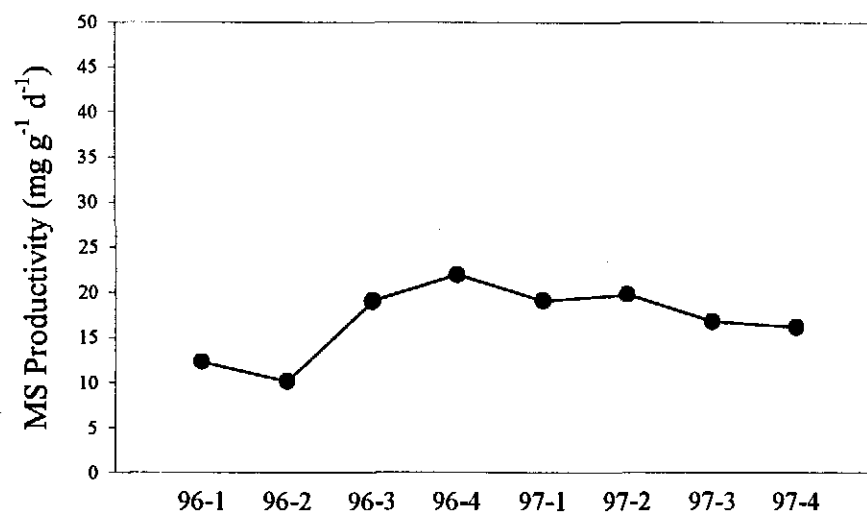
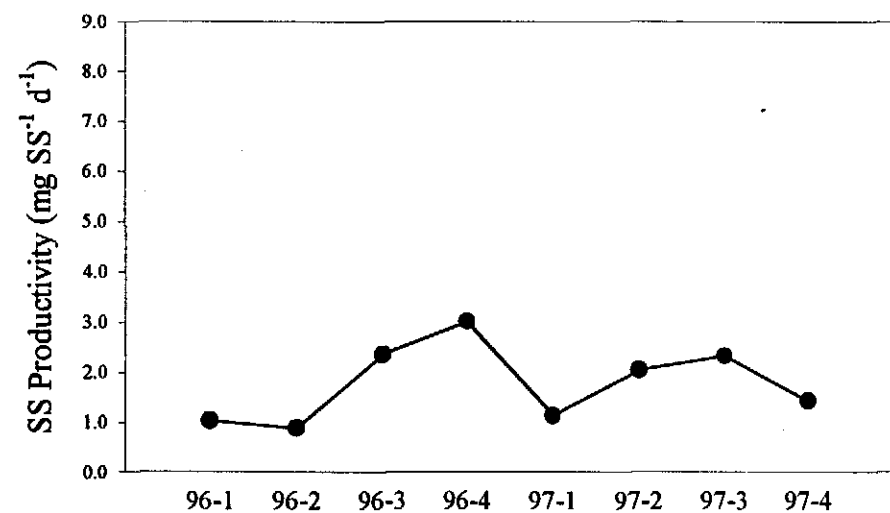


Figure 7a. Site 223. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 7b. Site 223. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 7c. Site 223. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

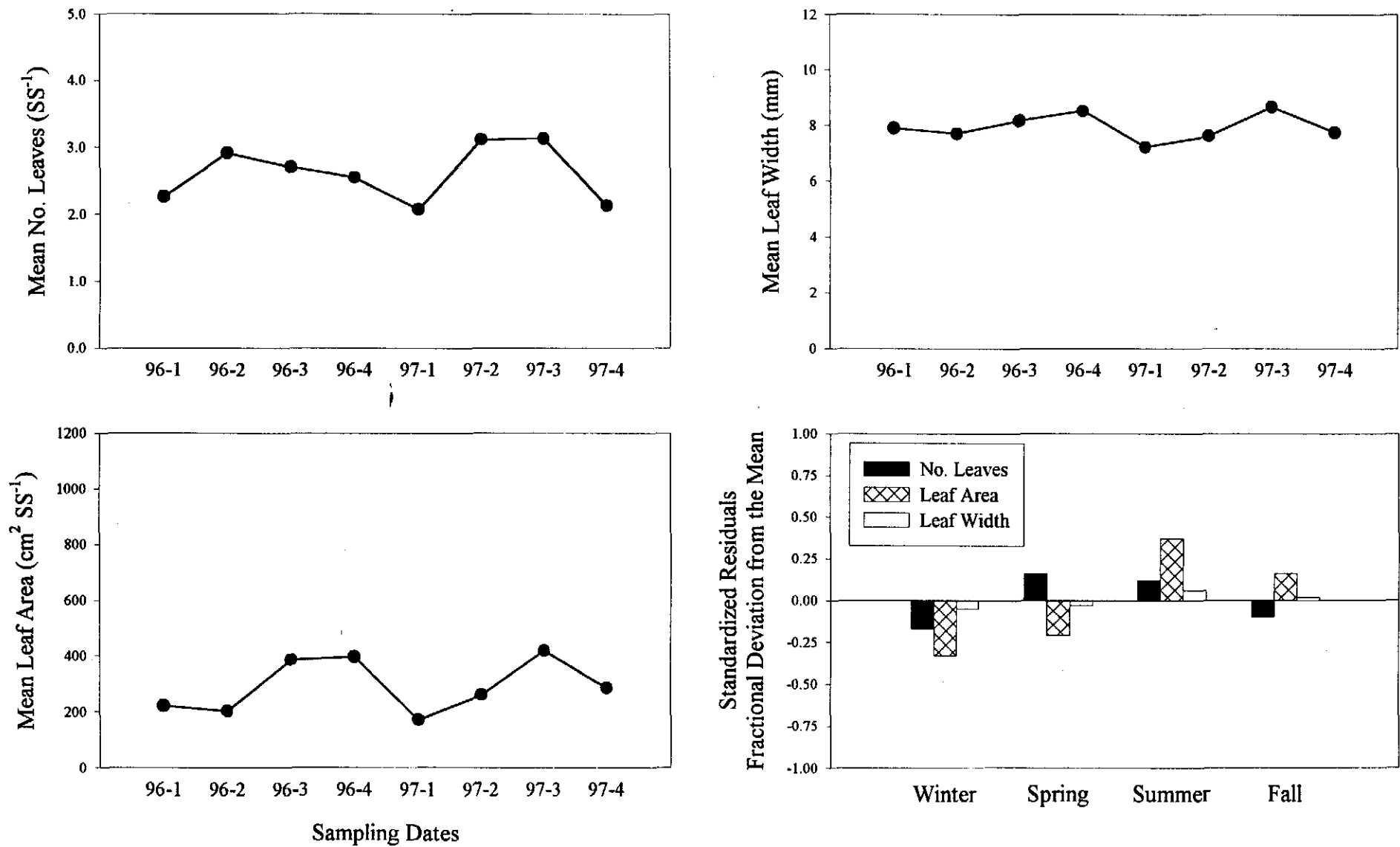
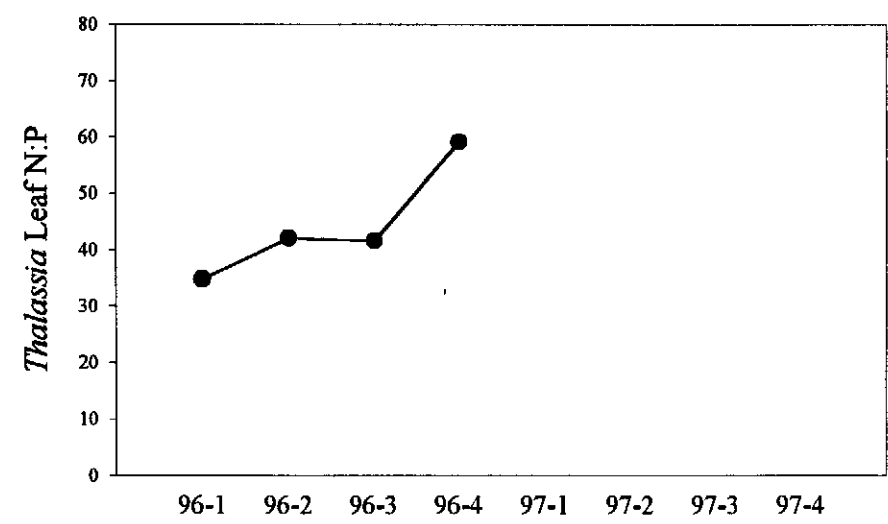
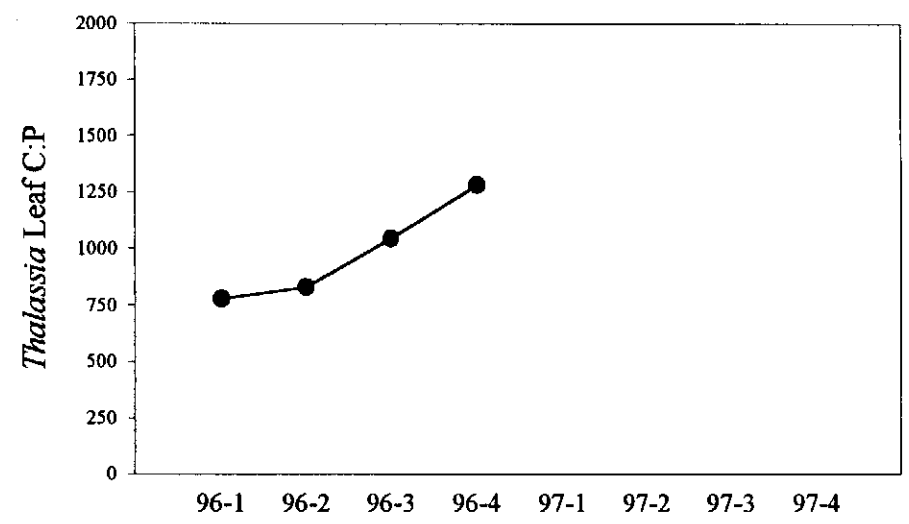
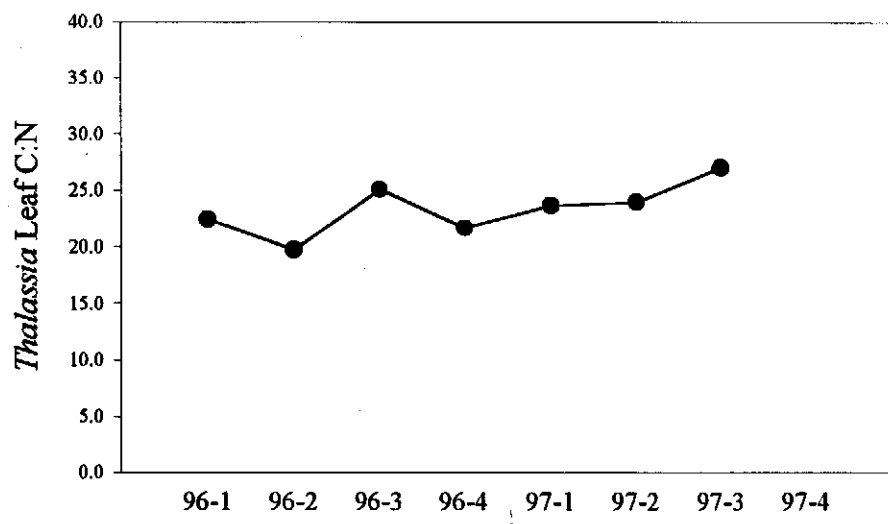


Figure 7d. Site 223. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 7e. Site 223. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

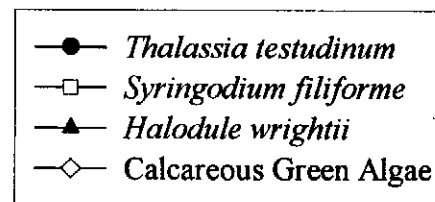
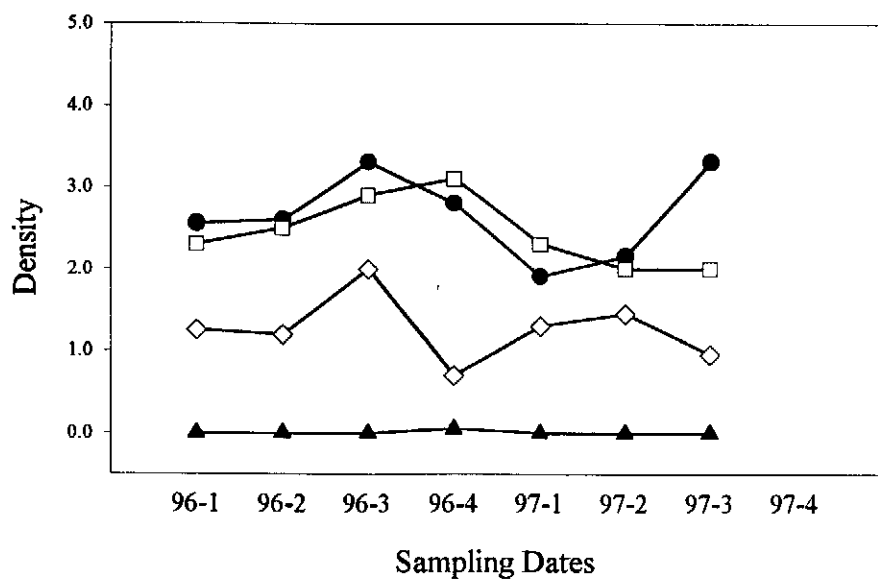
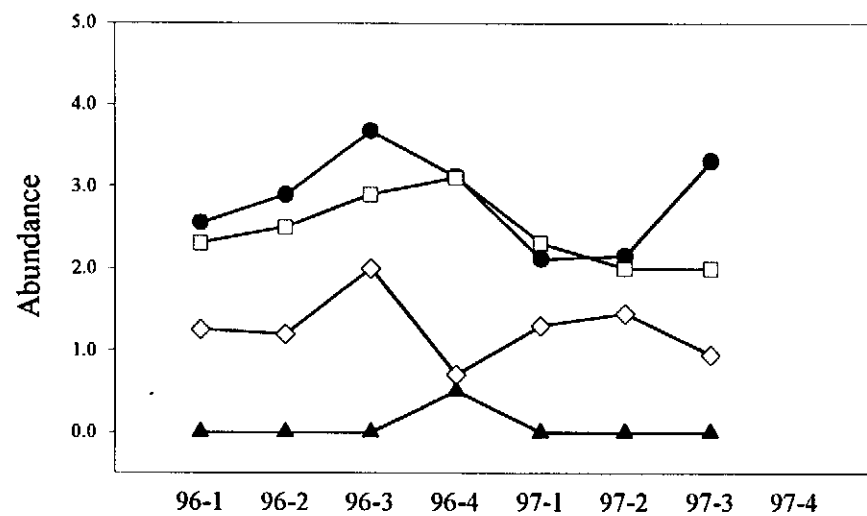
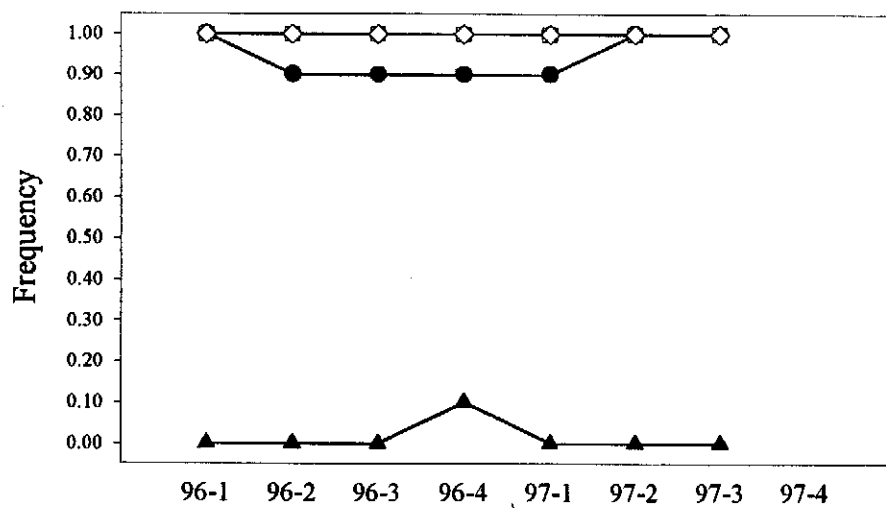
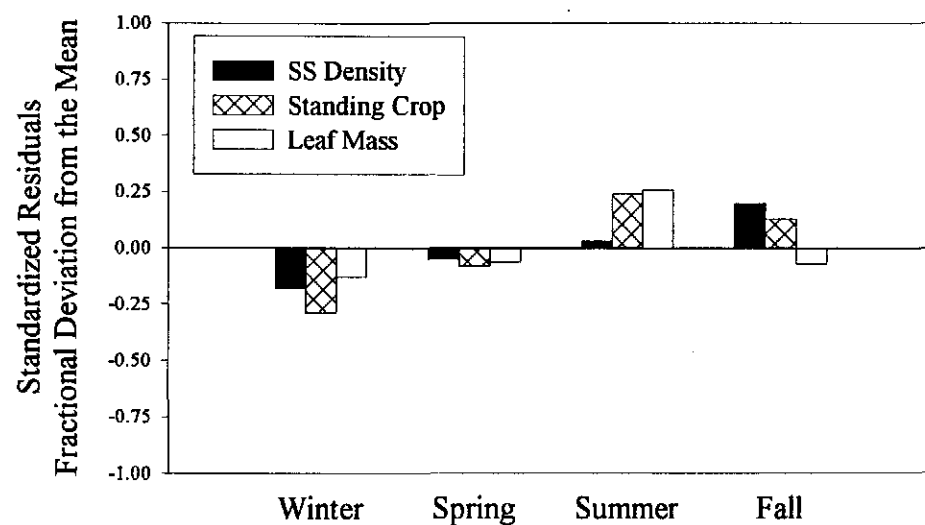
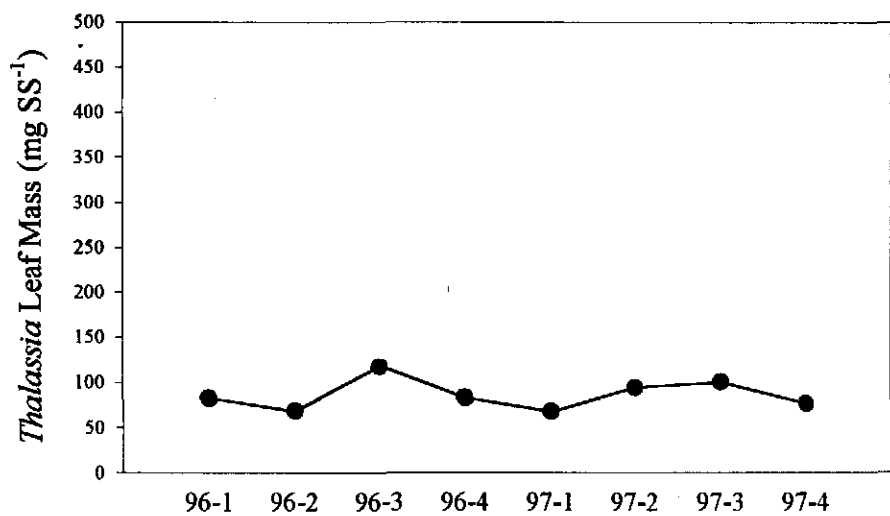
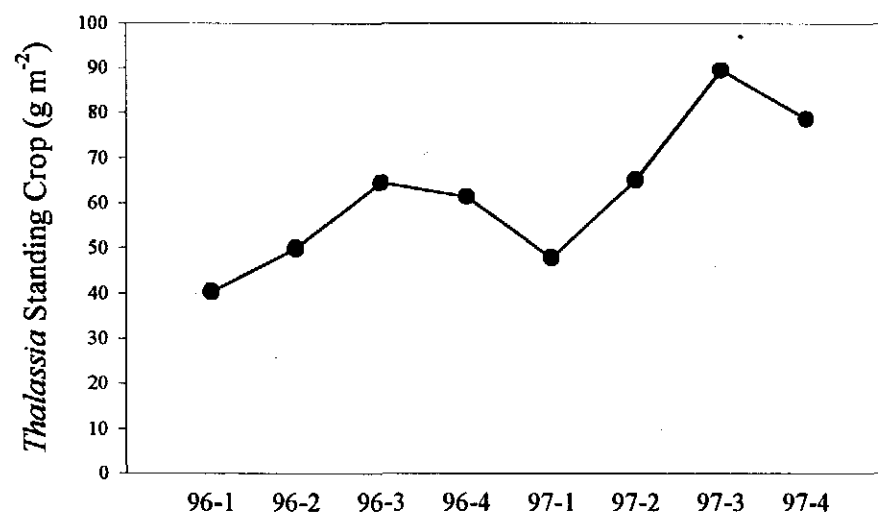
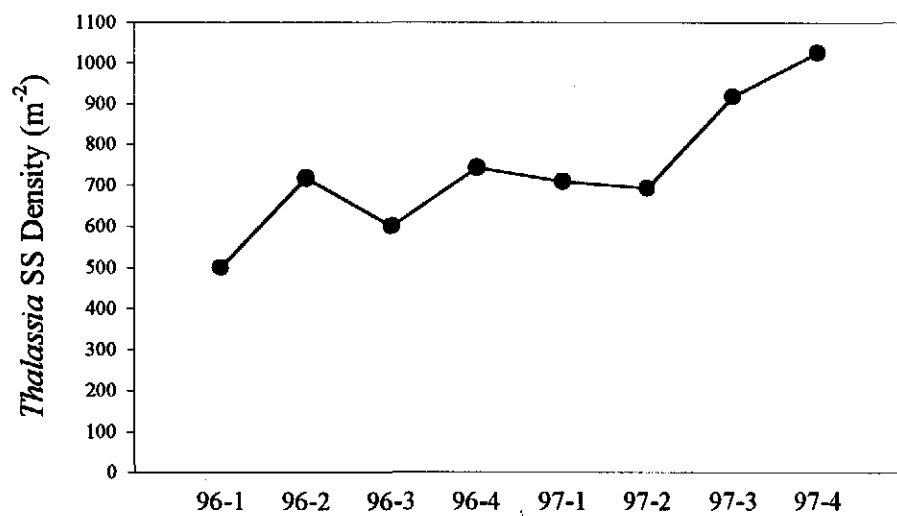
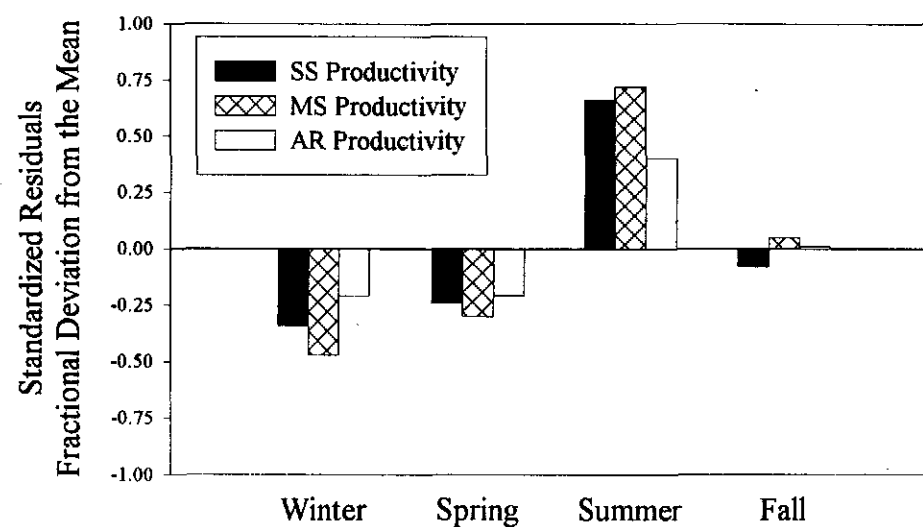
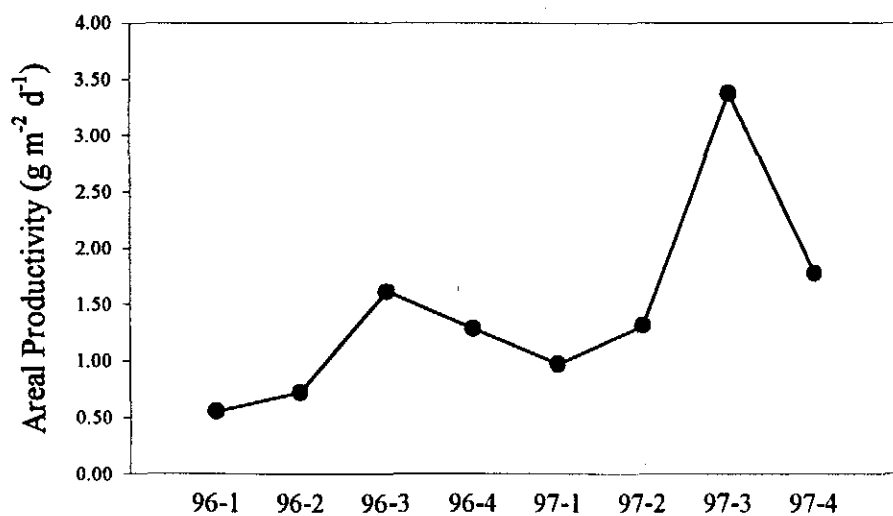
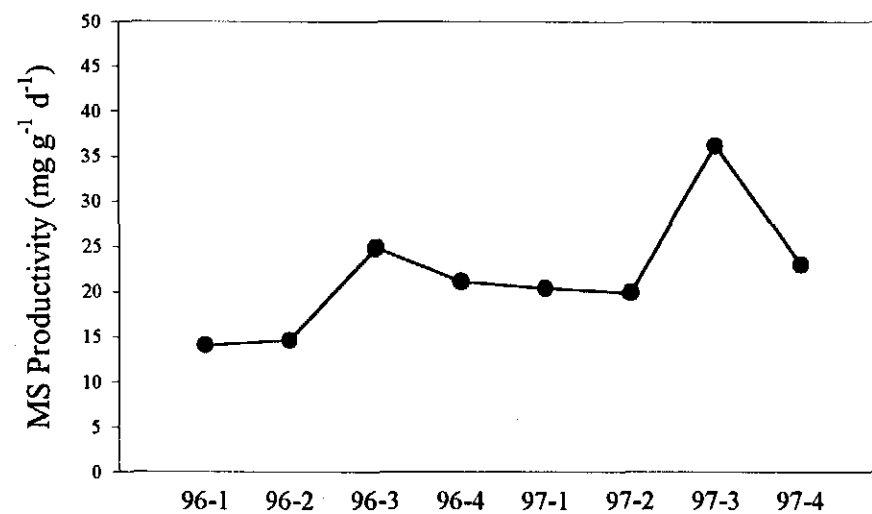
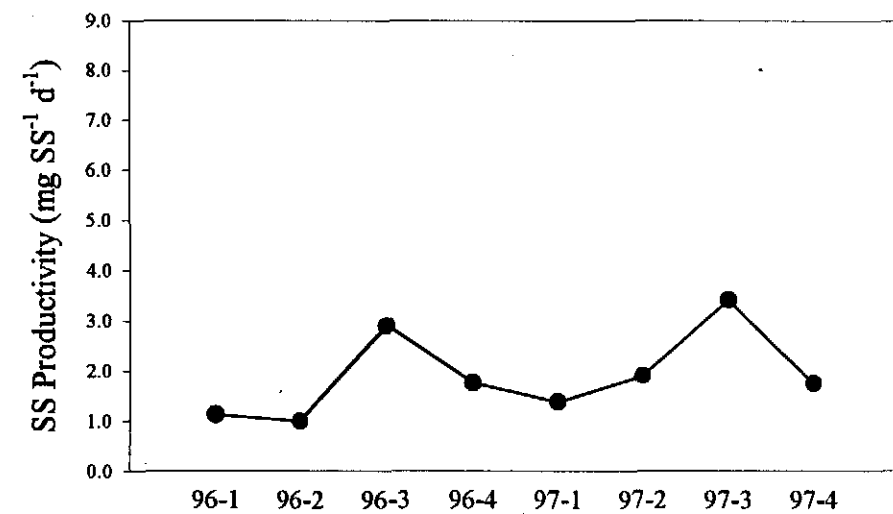


Figure 8a. Site 225. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 8b. Site 225. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 8c. Site 225. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

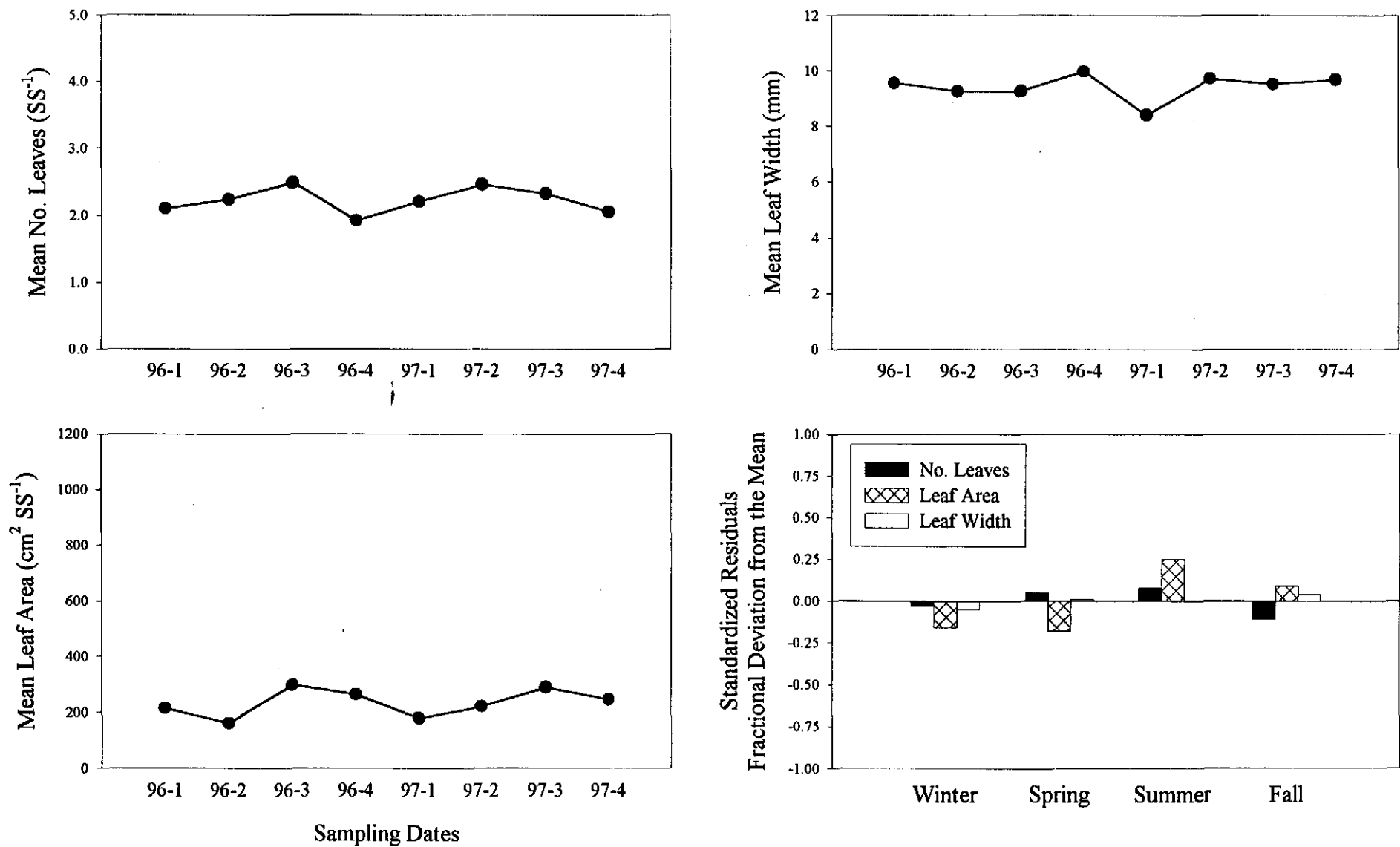
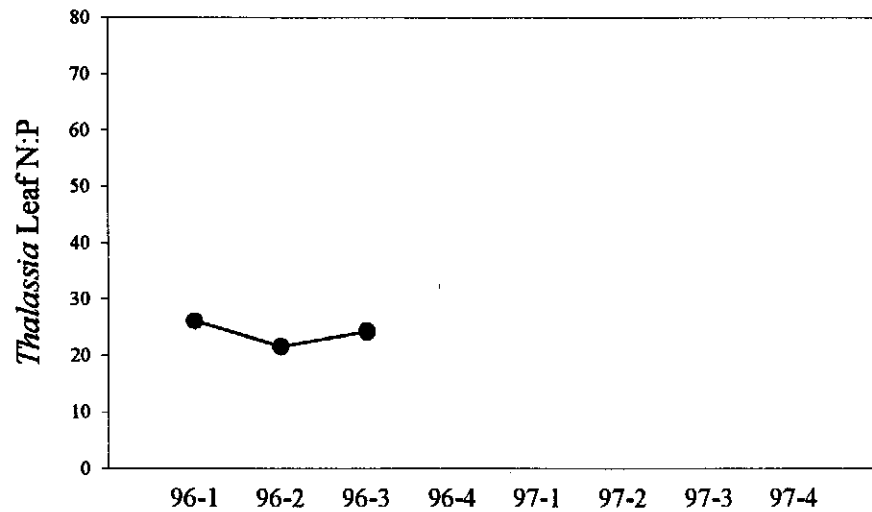
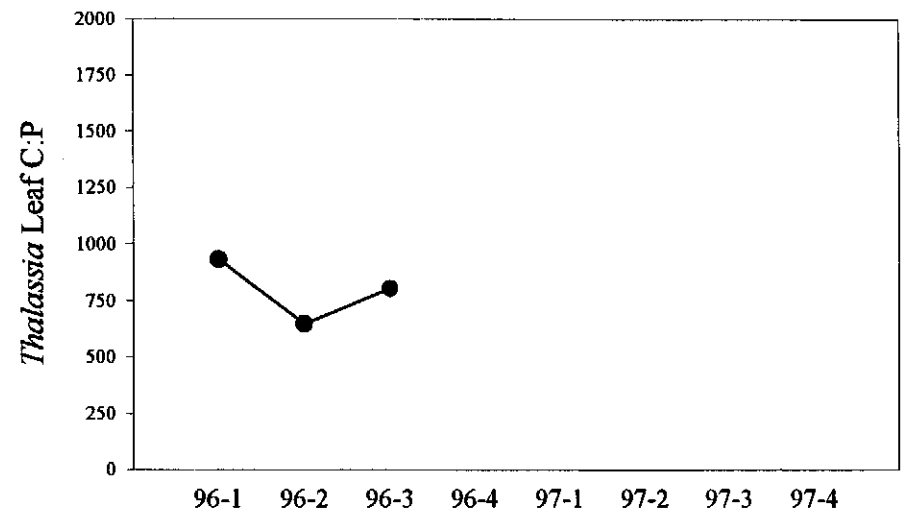
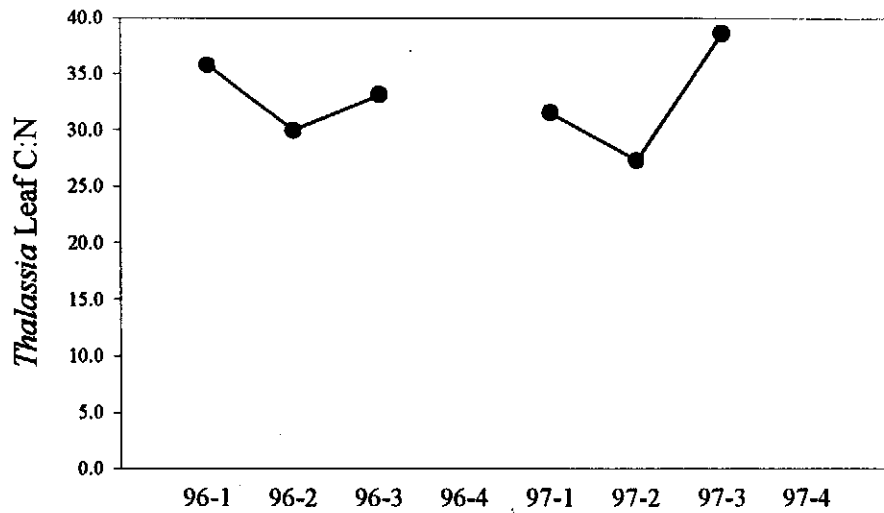


Figure 8d. Site 225. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 8e. Site 225. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

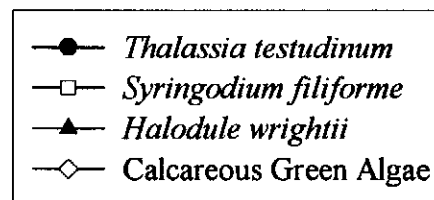
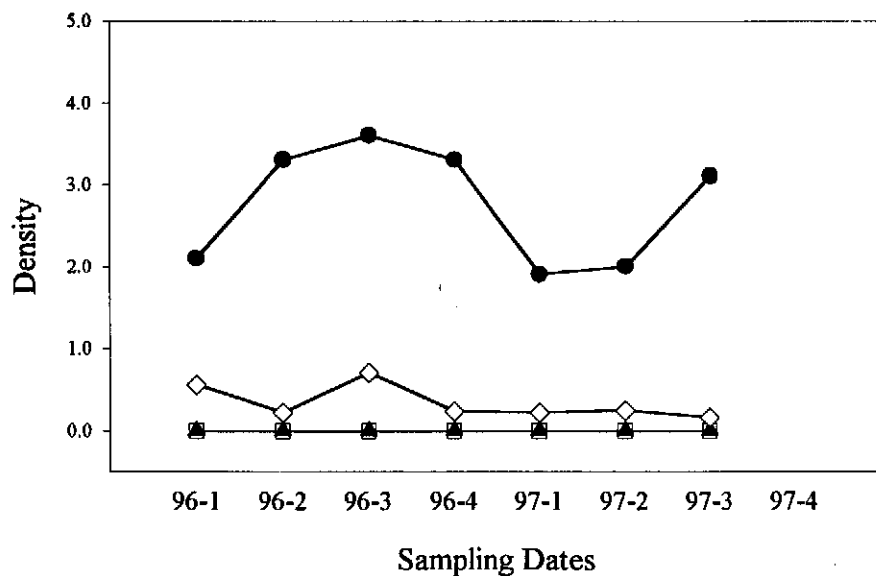
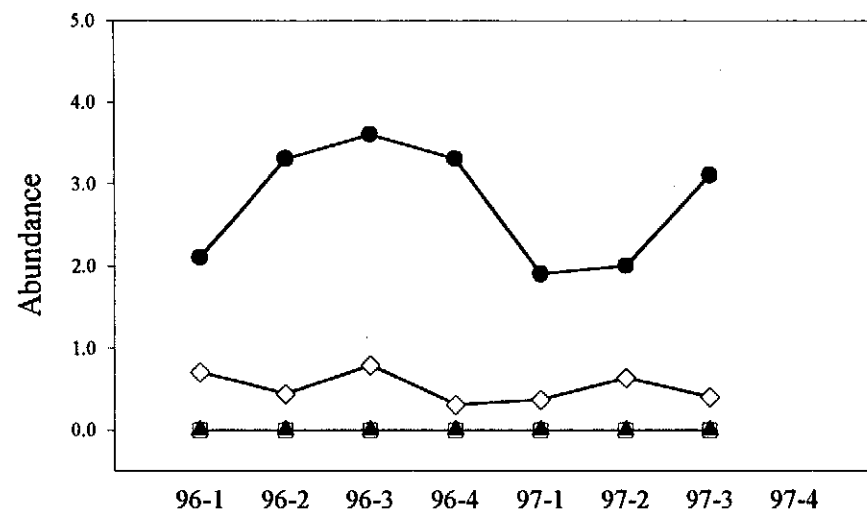
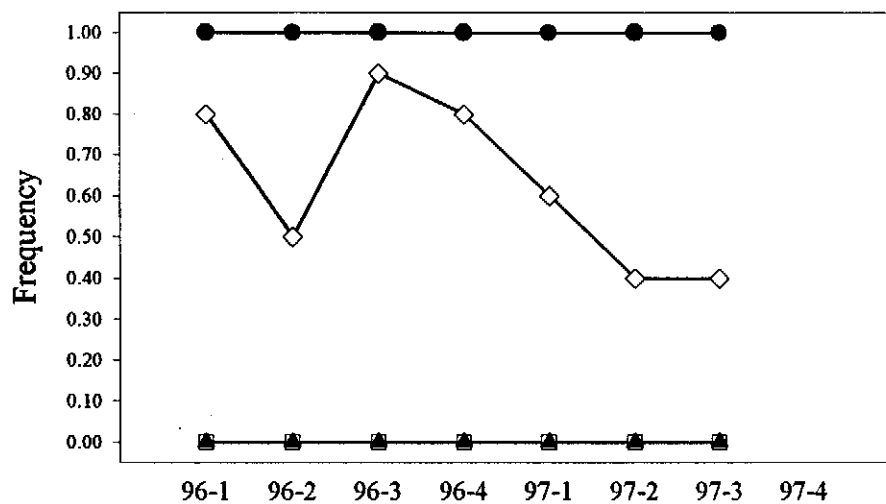
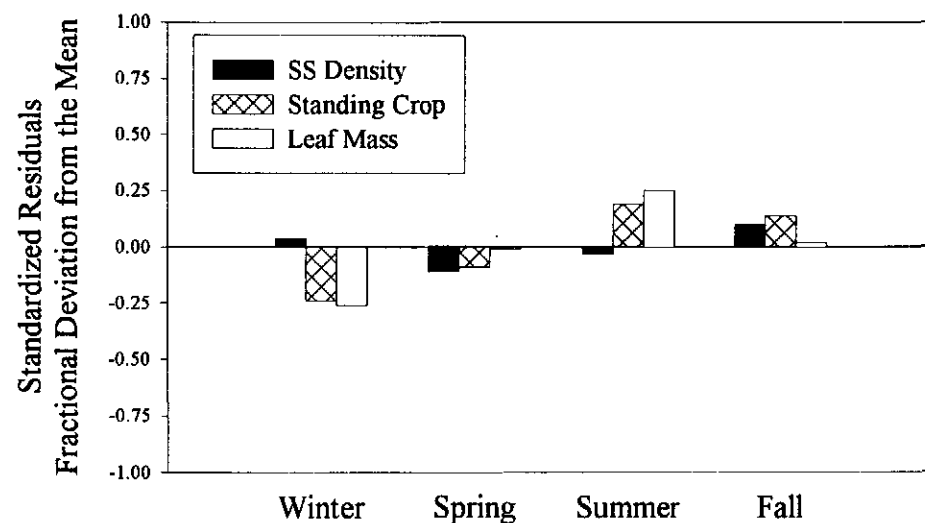
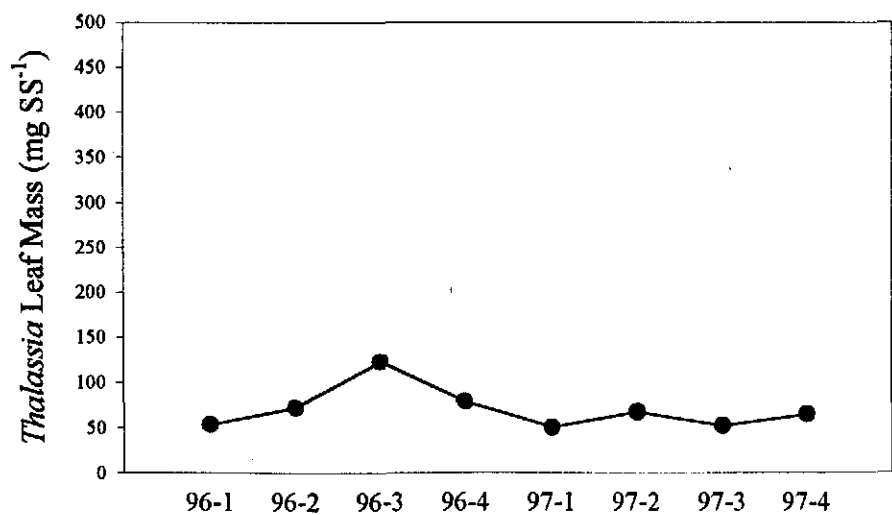
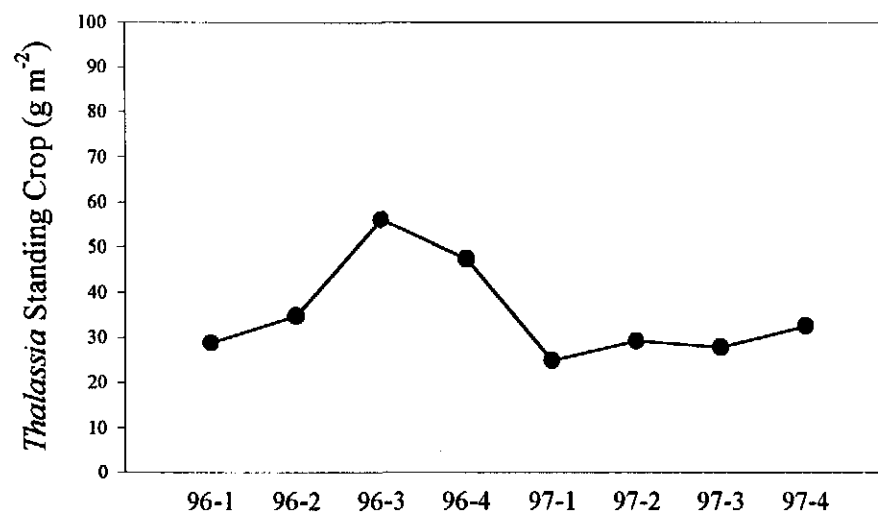
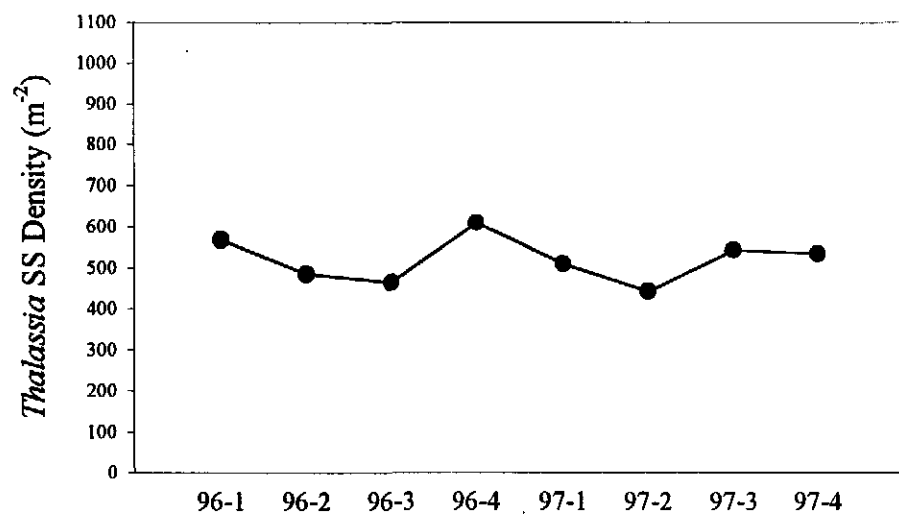
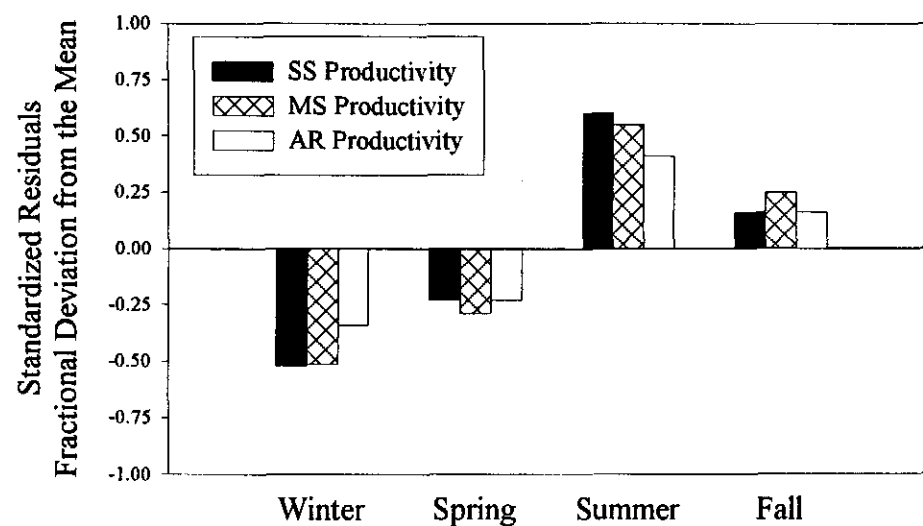
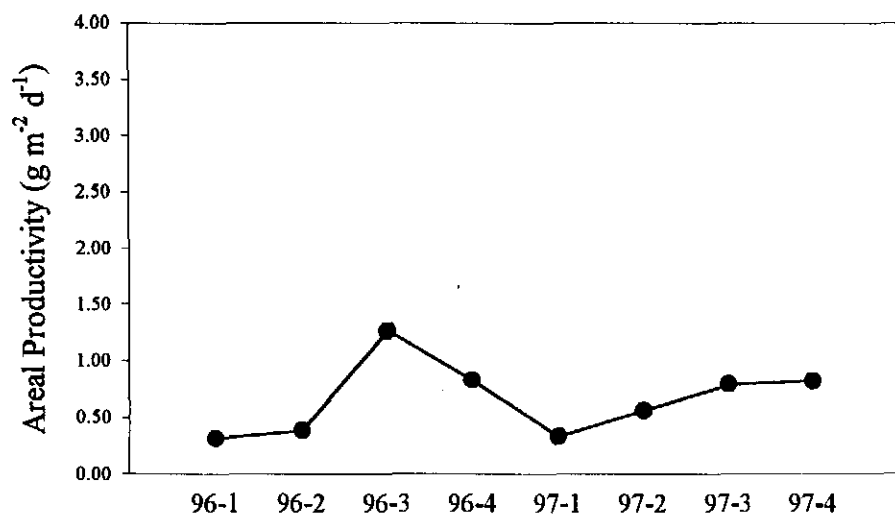
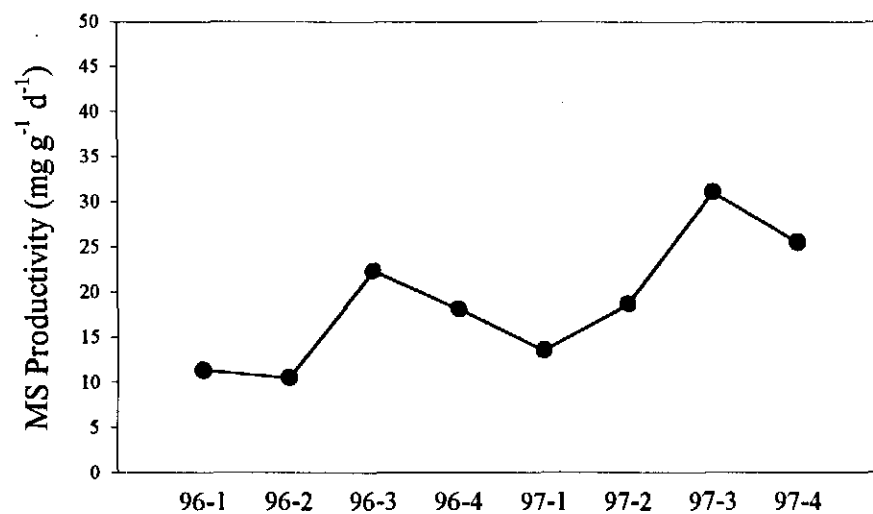
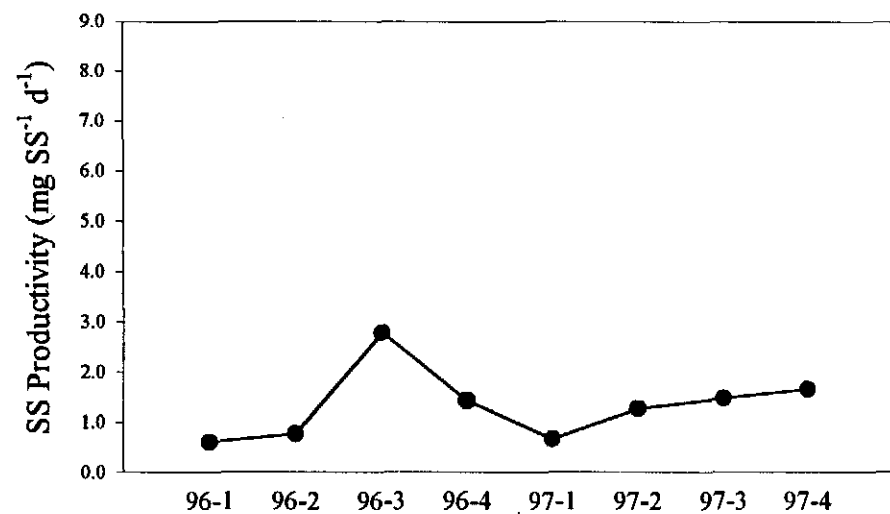


Figure 9a. Site 227. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m-line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 9b. Site 227. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 9c. Site 227. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

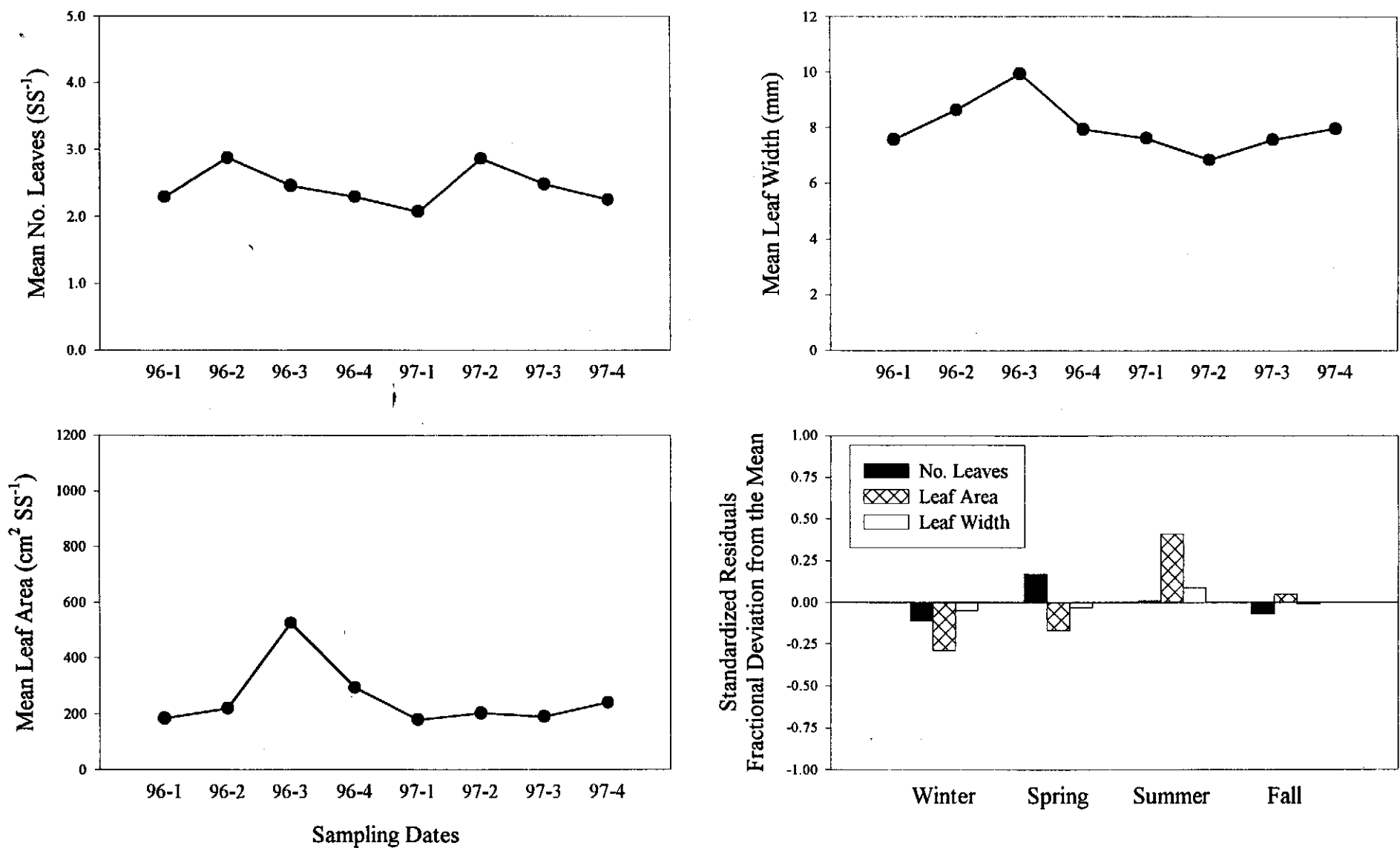
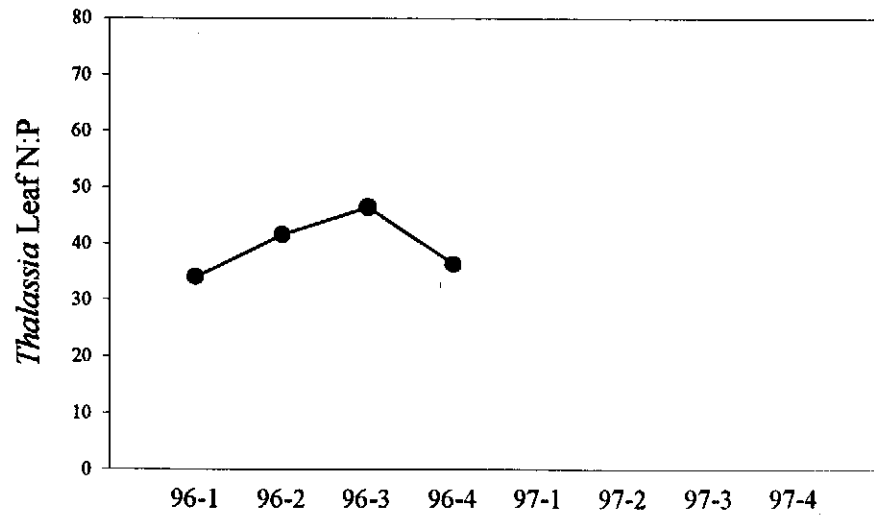
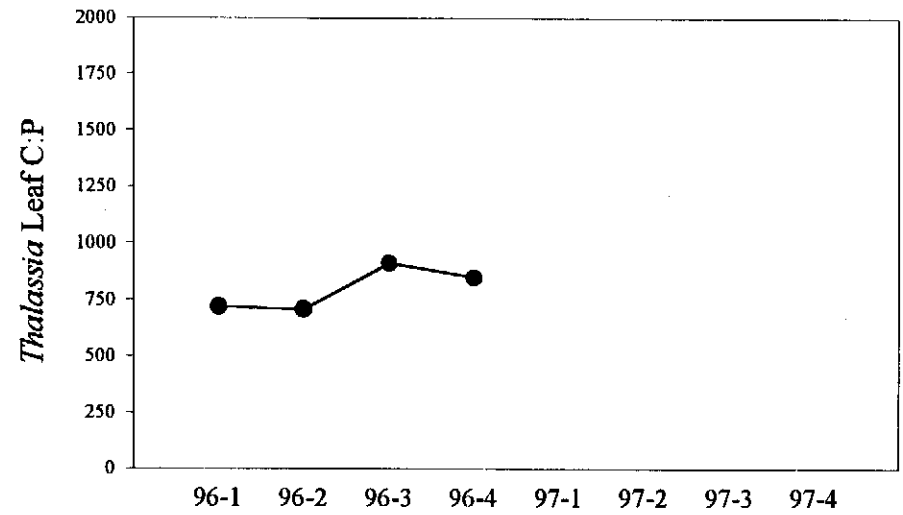
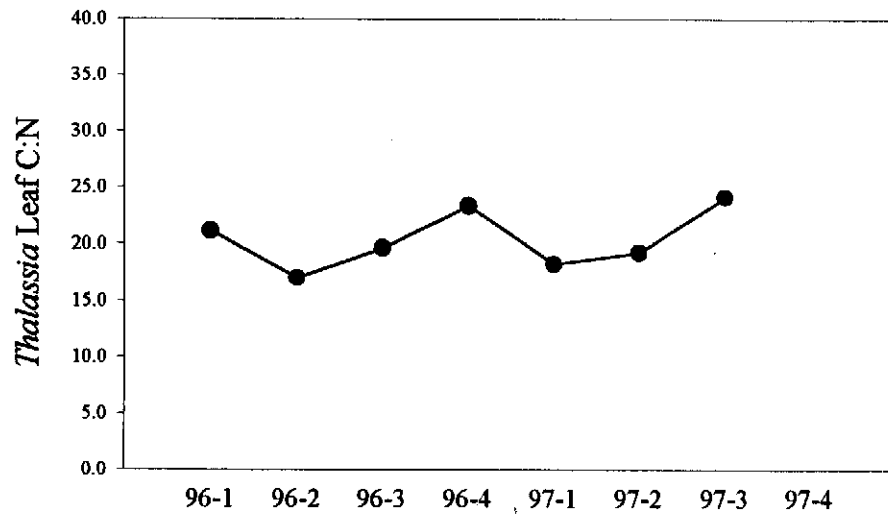


Figure 9d. Site 227. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 9e. Site 227. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

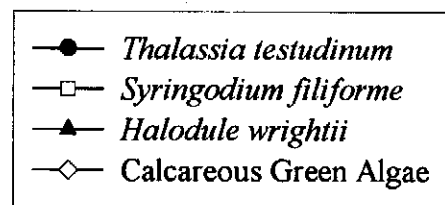
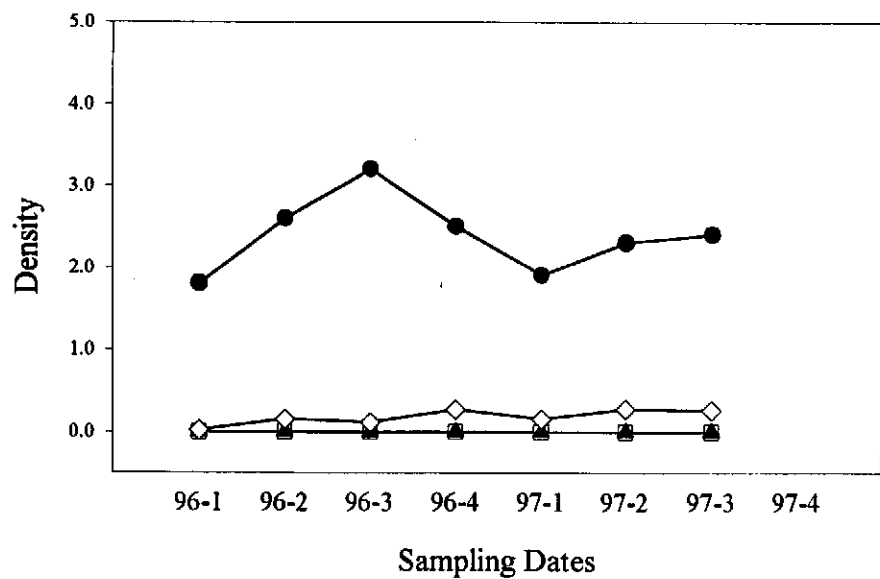
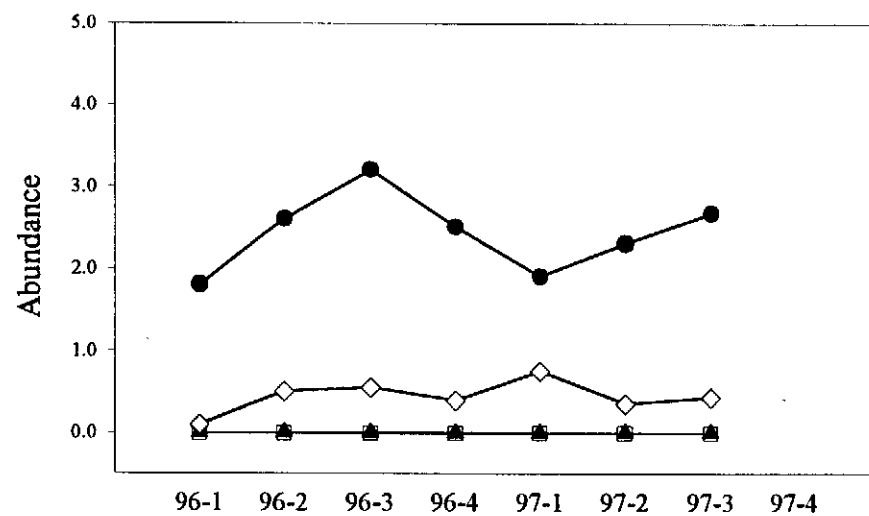
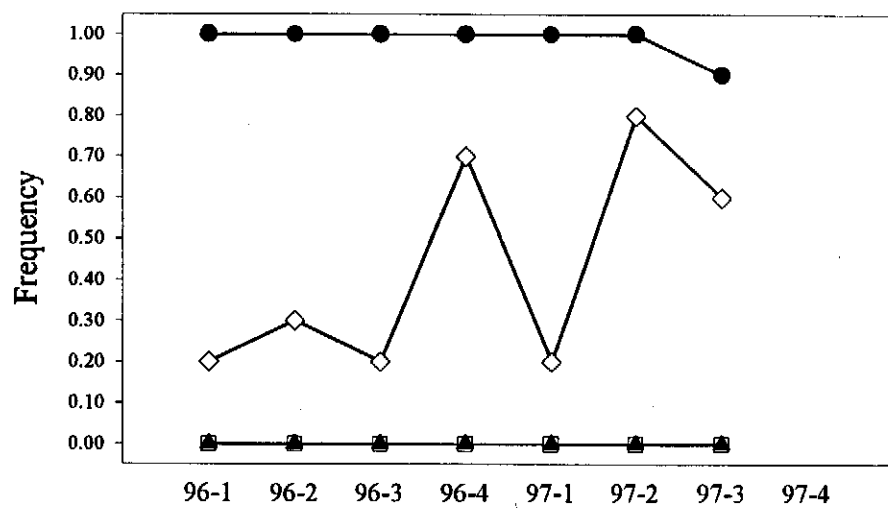
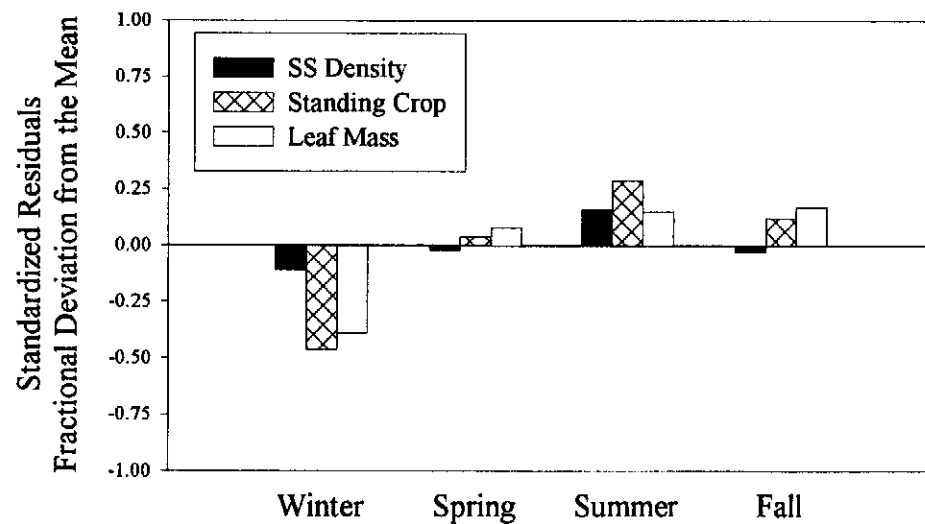
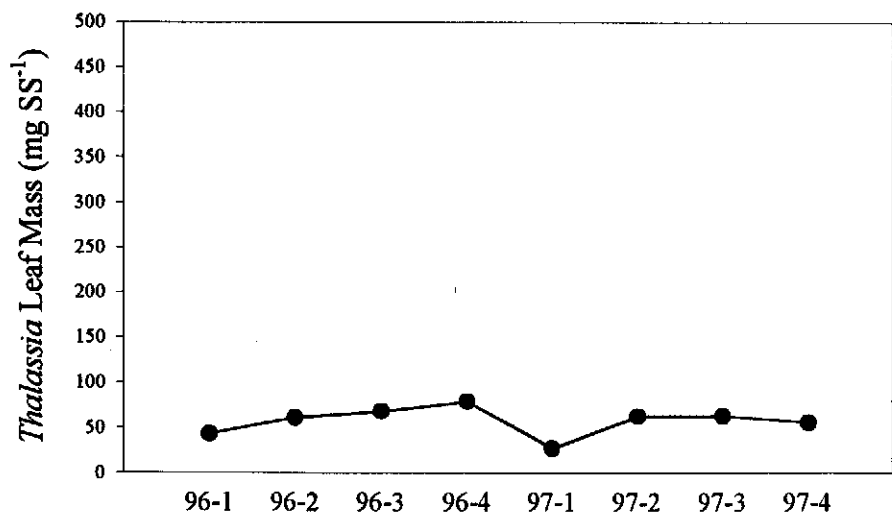
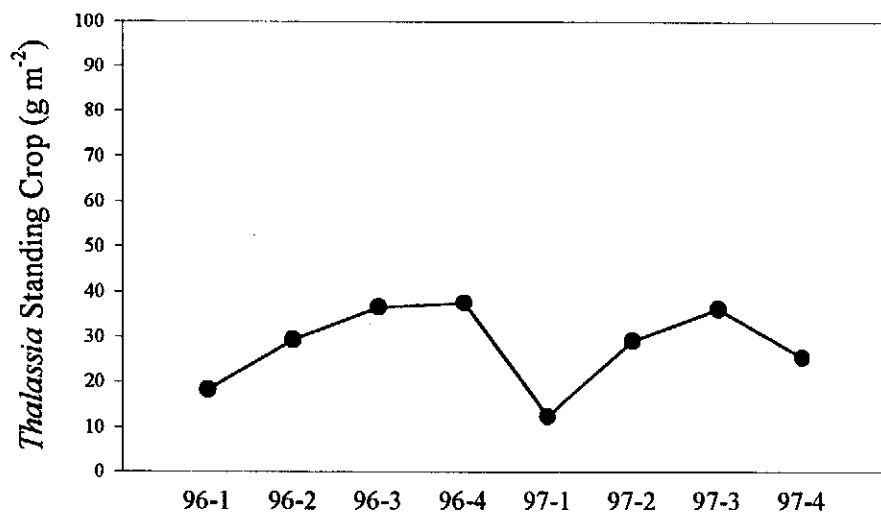
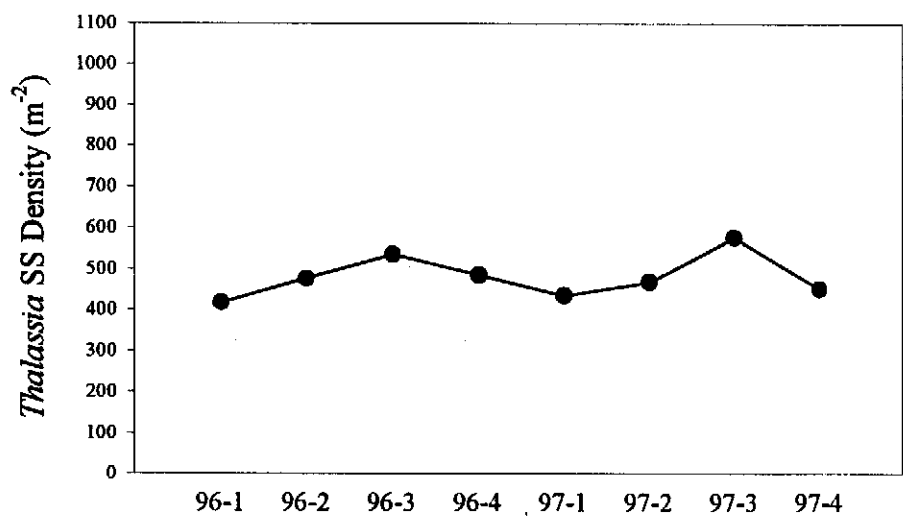
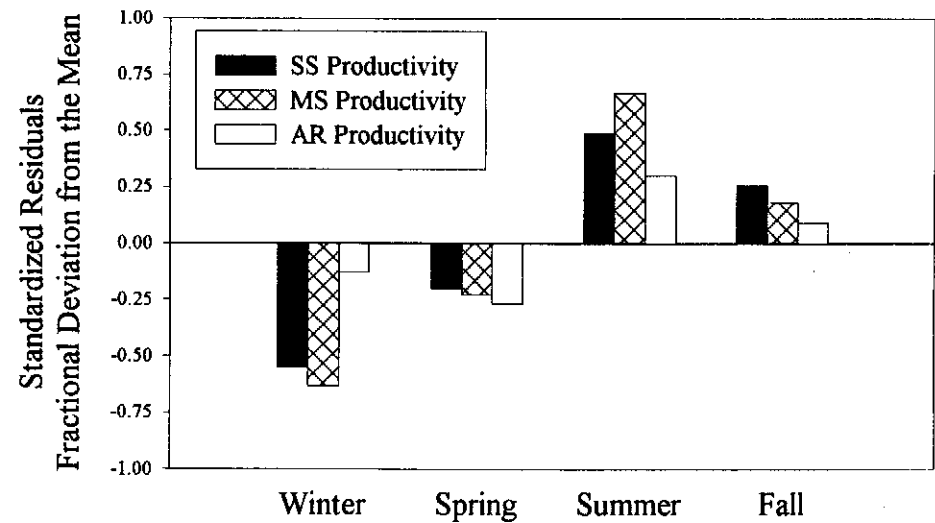
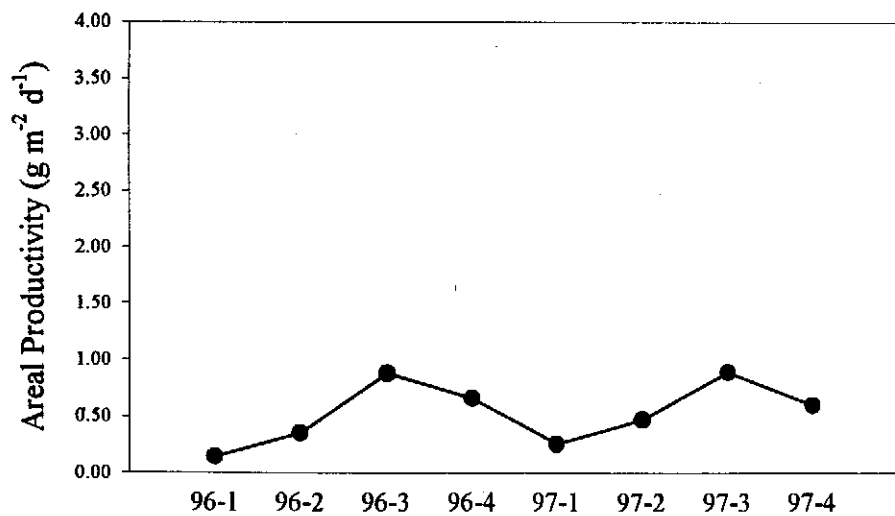
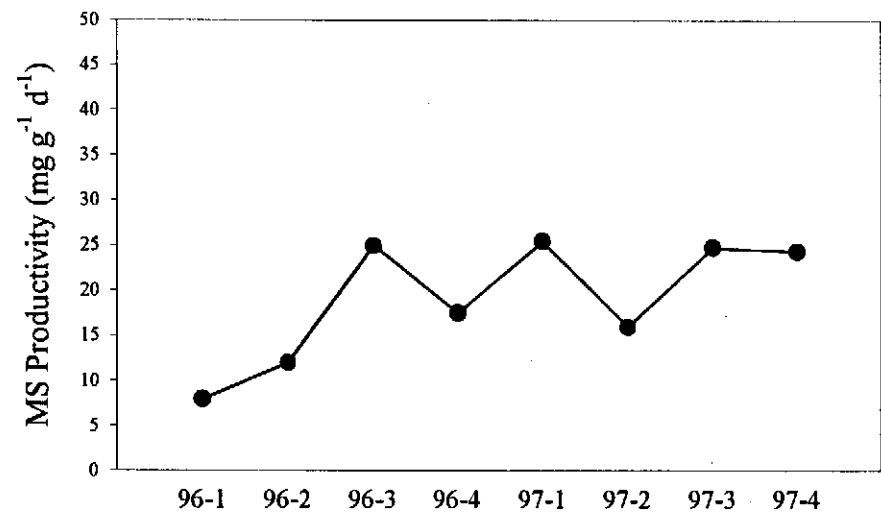
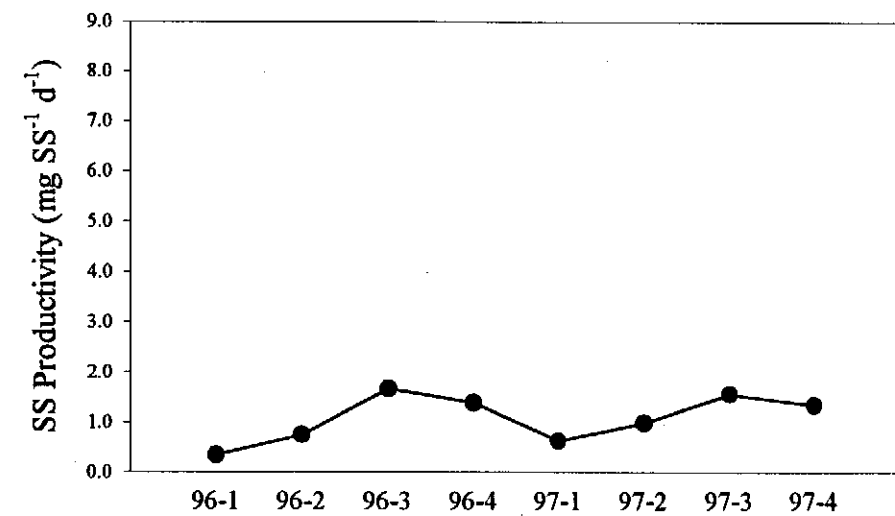


Figure 10a. Site 235. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 10b. Site 235. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 10c. Site 235. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

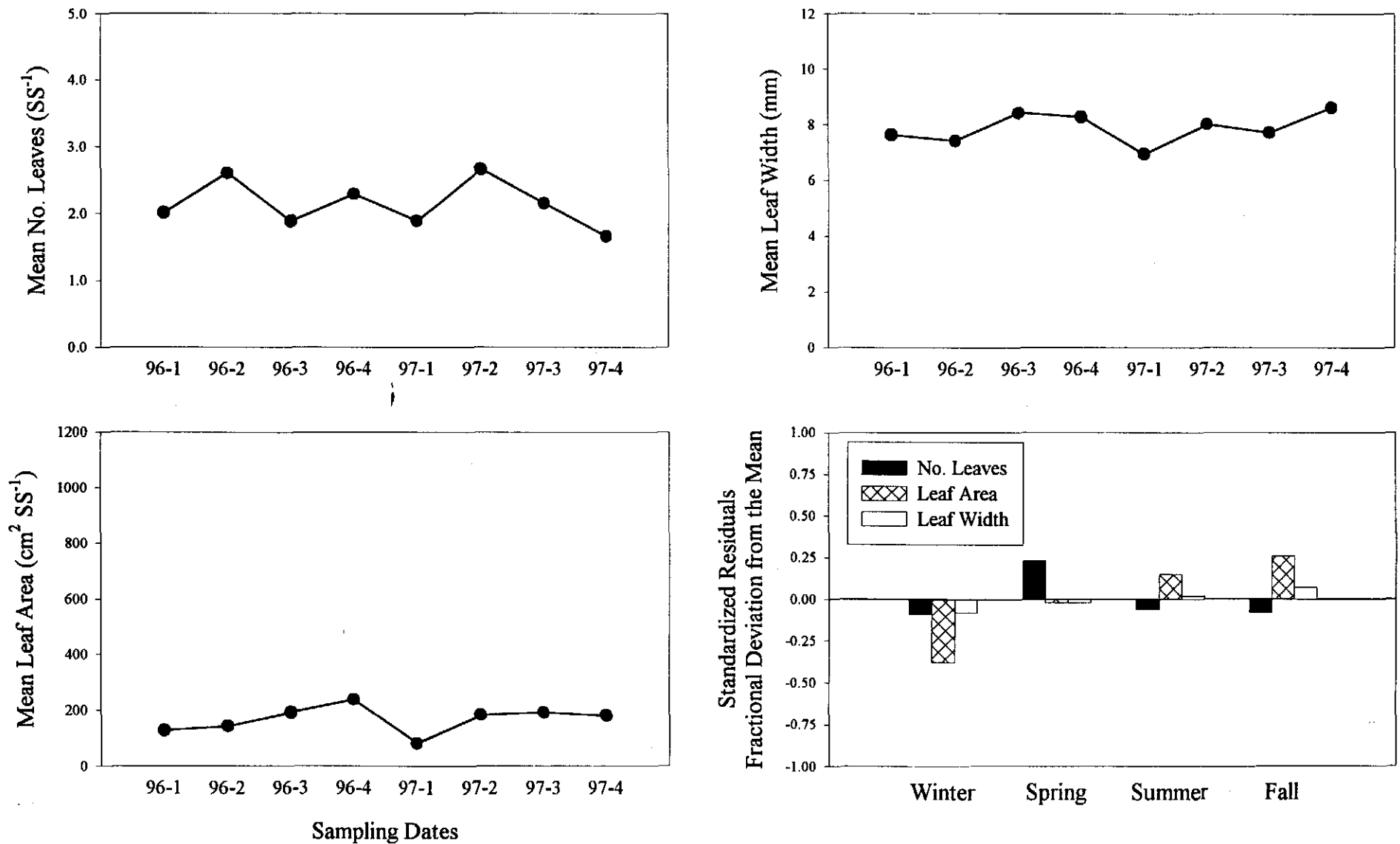
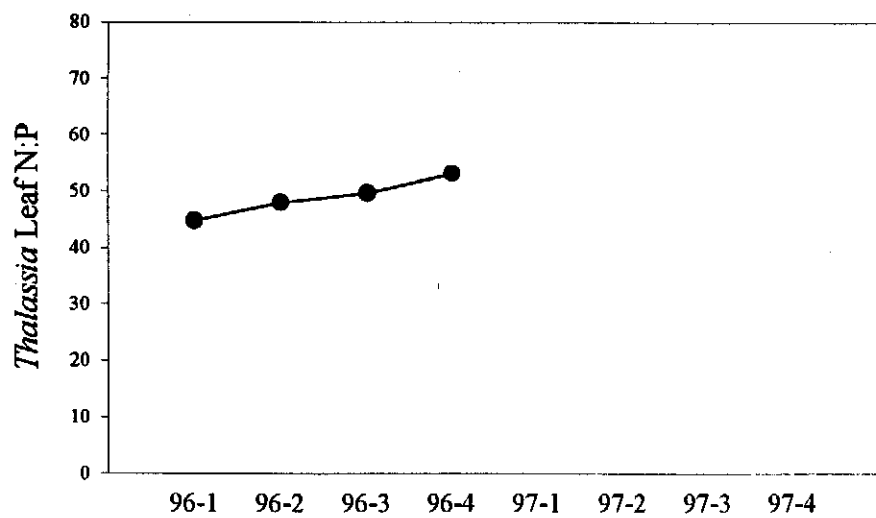
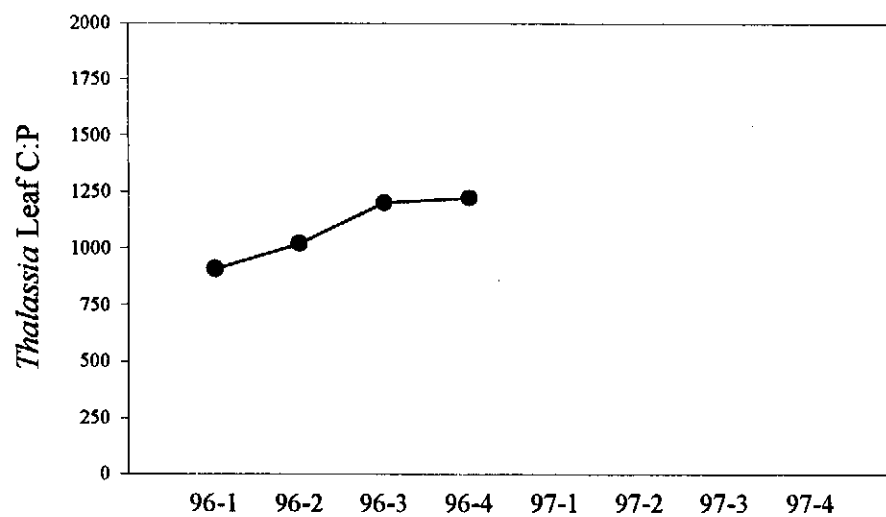
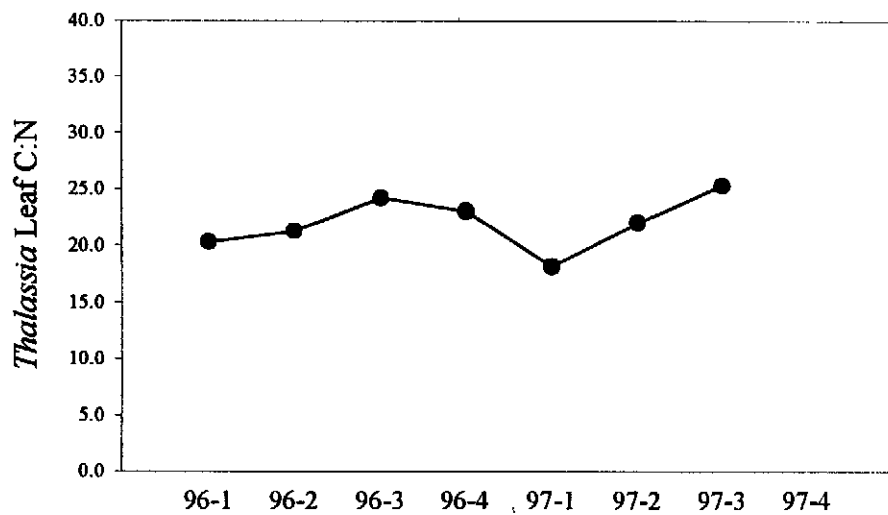
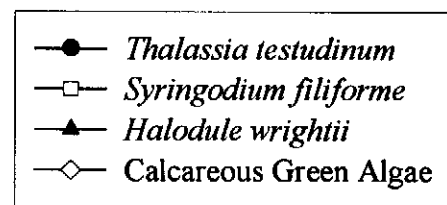
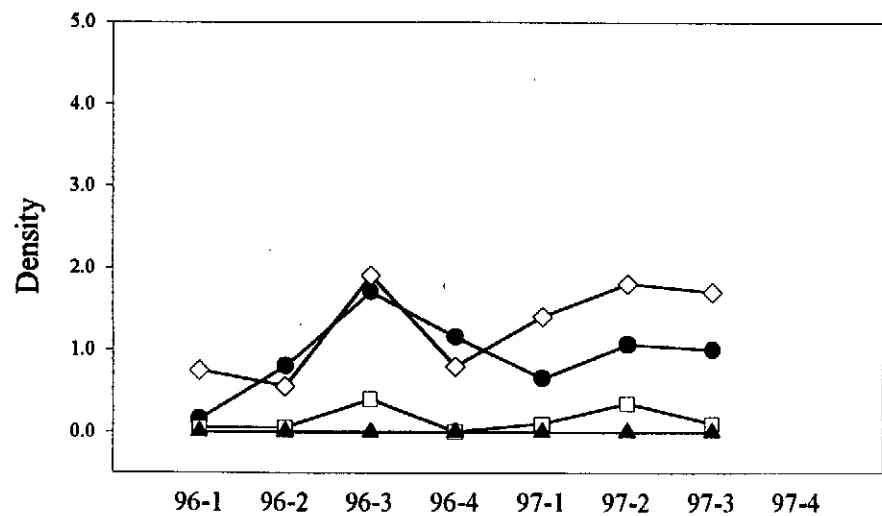
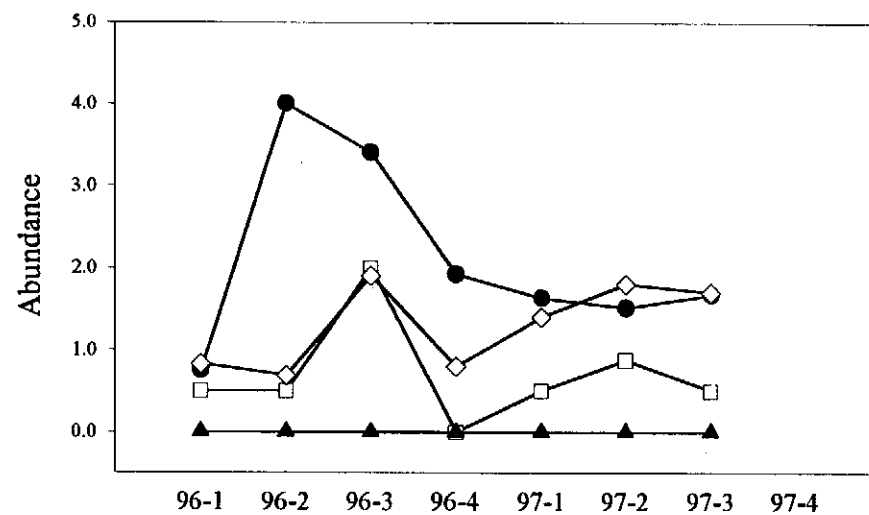
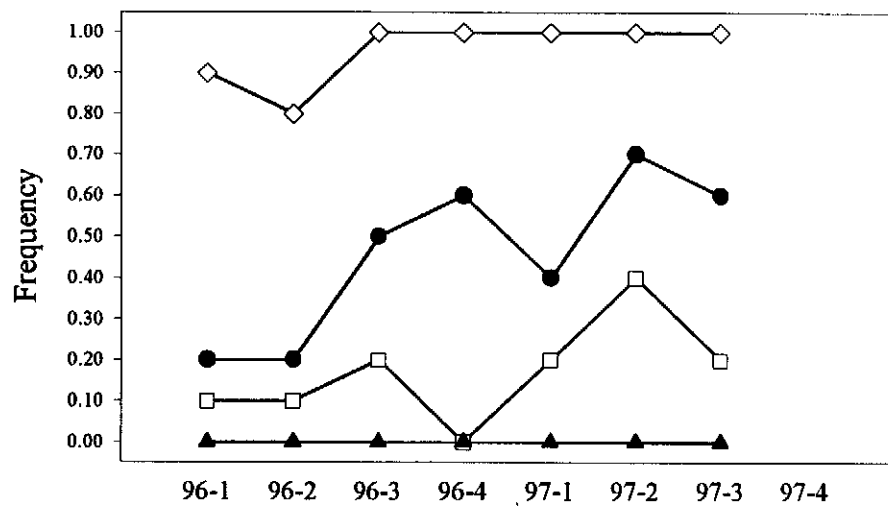


Figure 10d. Site 235. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



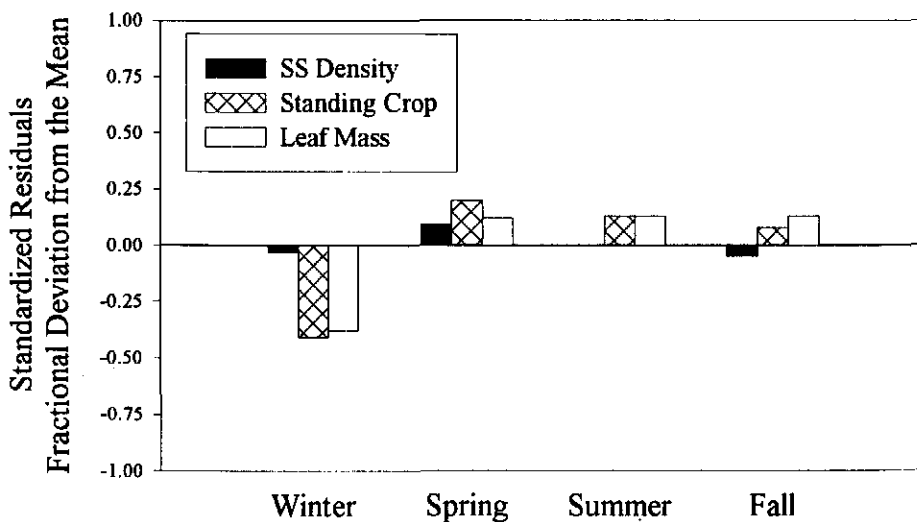
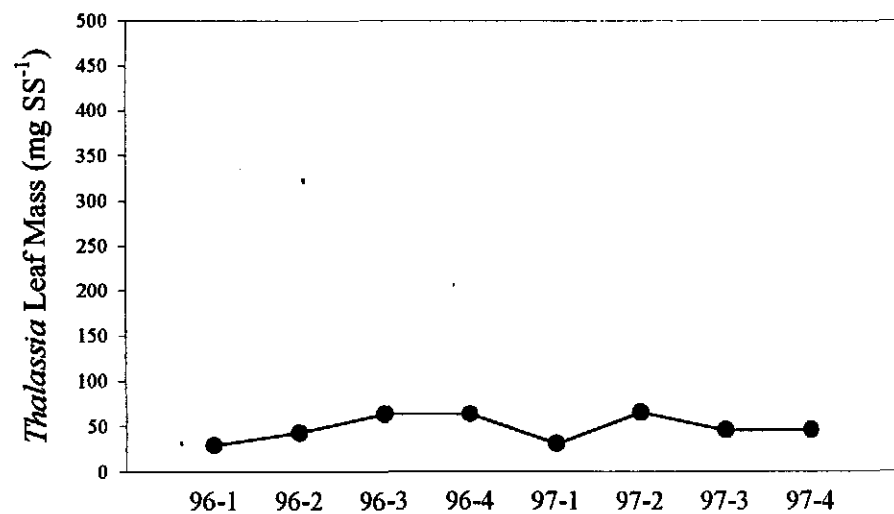
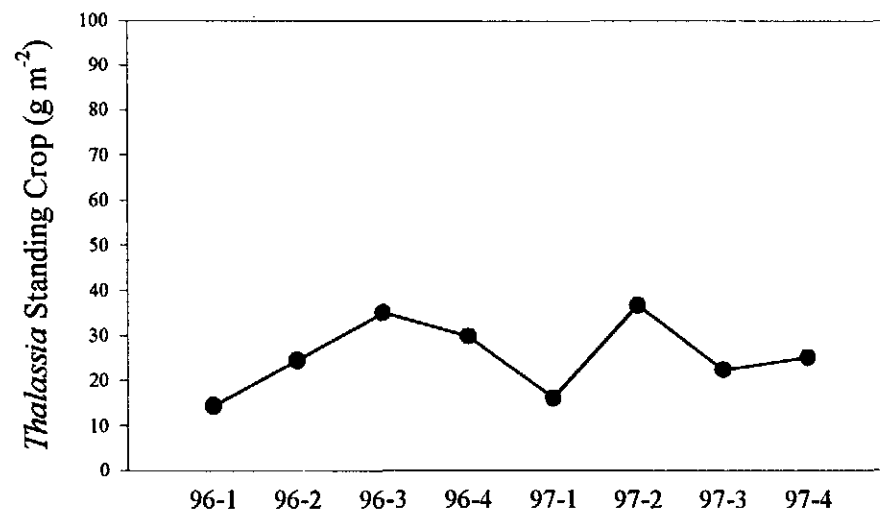
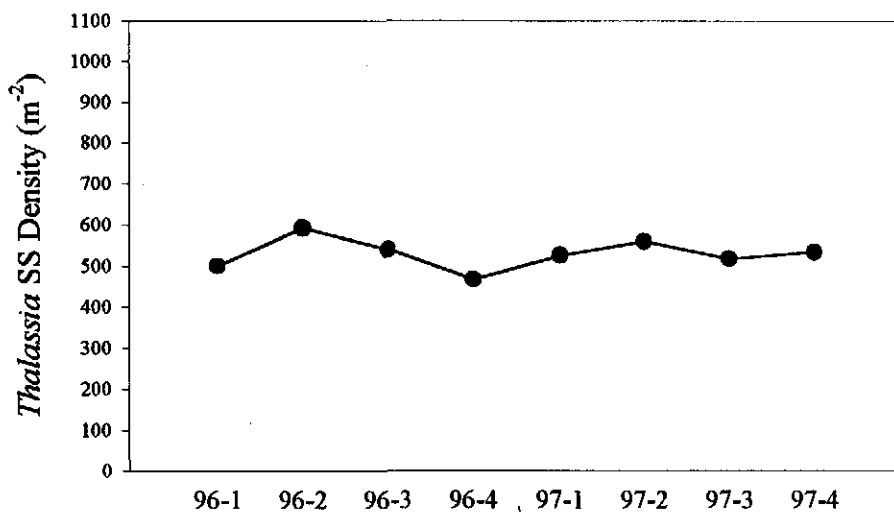
Sampling Dates

Figure 10e. Site 235. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



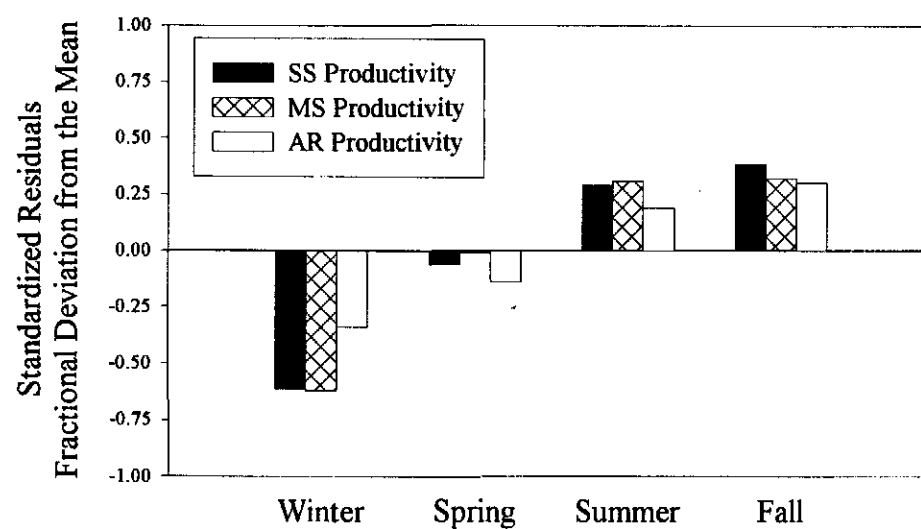
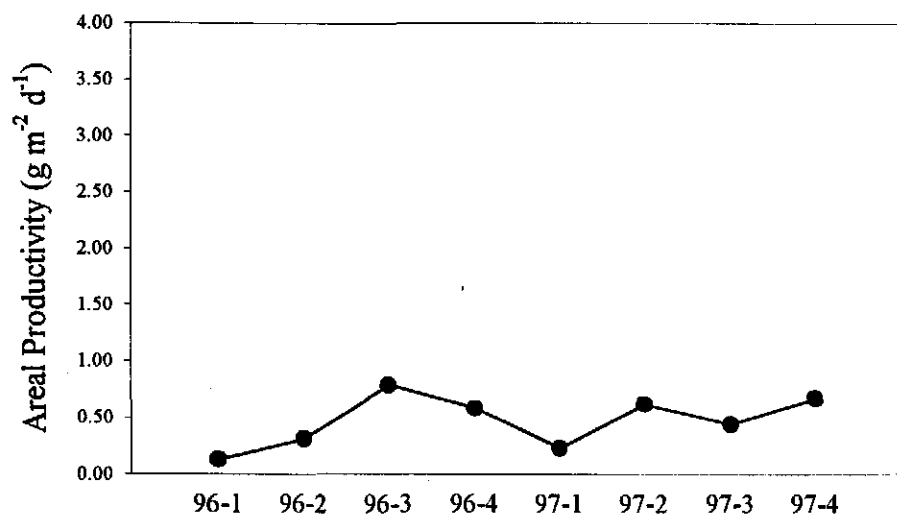
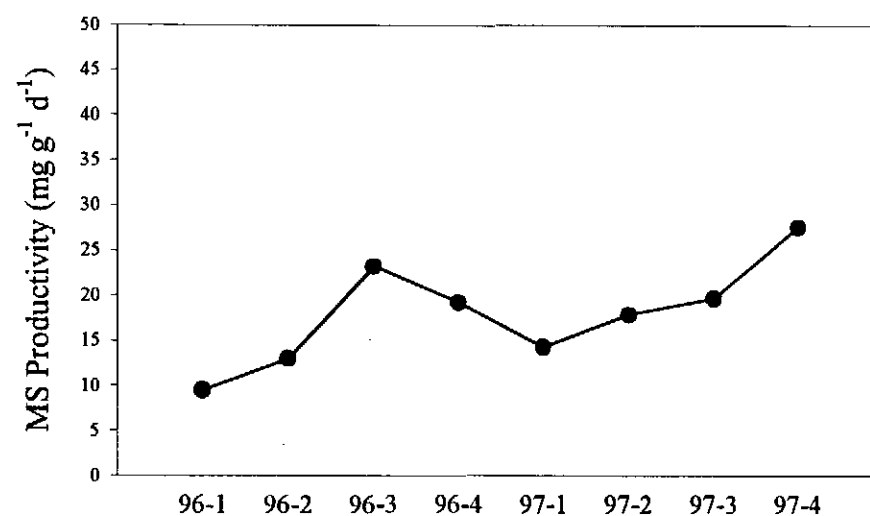
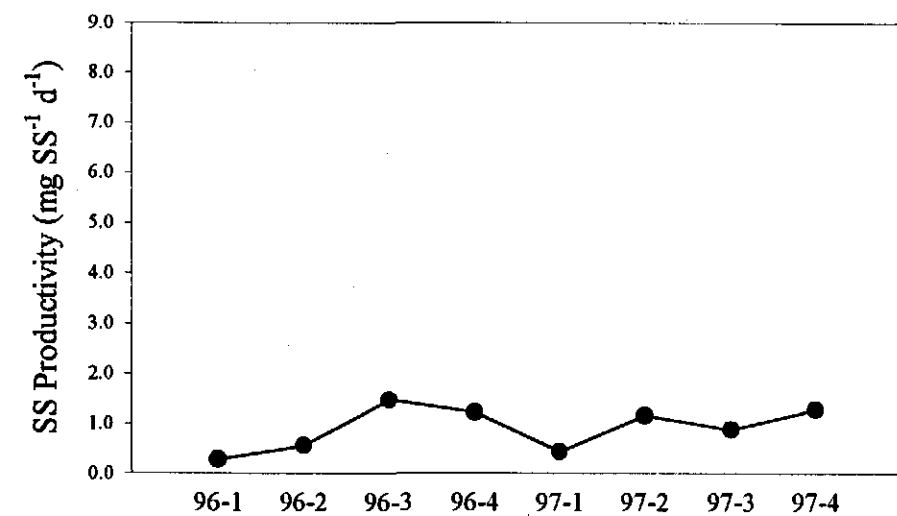
Sampling Dates

Figure 11a. Site 237. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 11b. Site 237. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 11c. Site 237. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

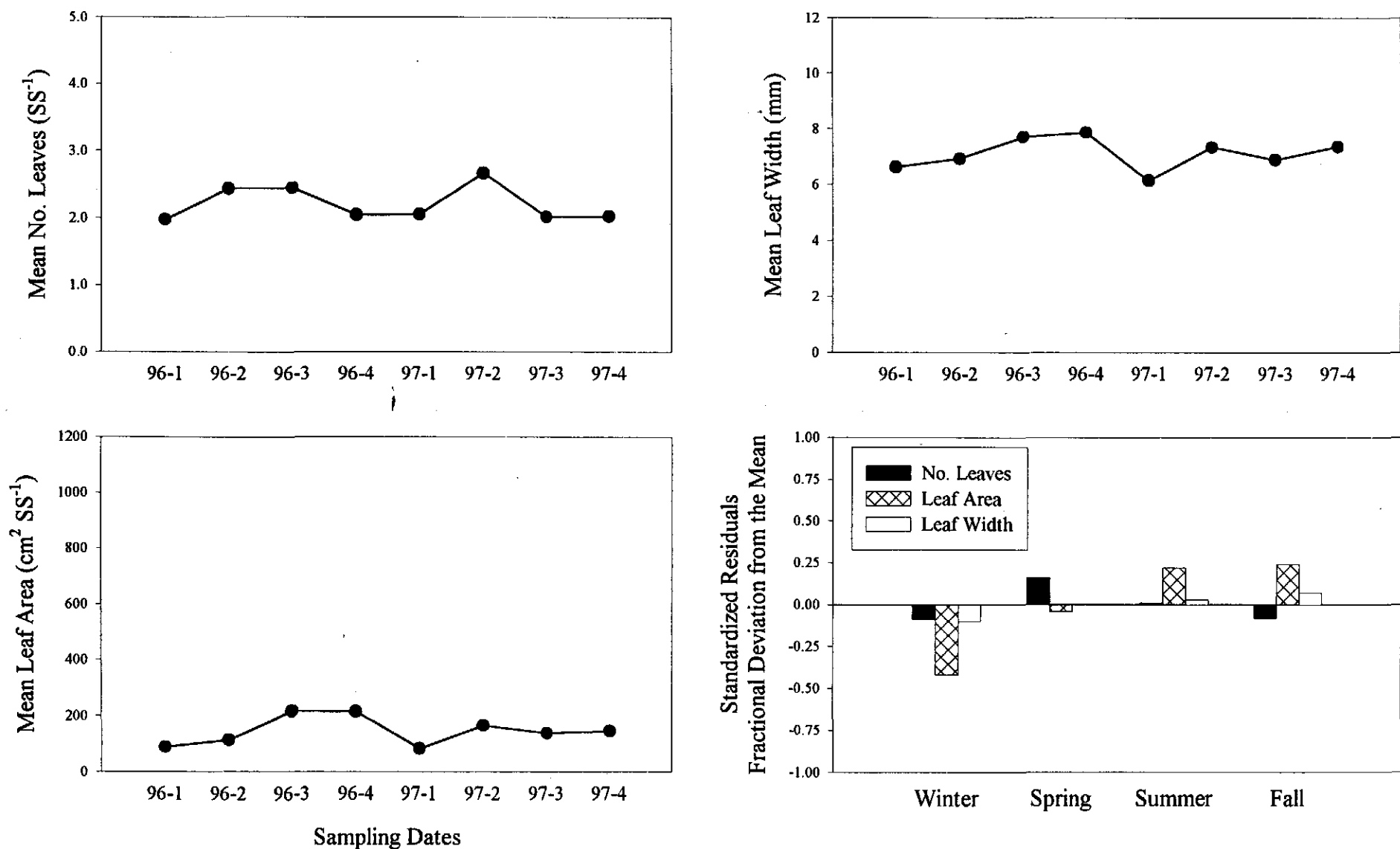
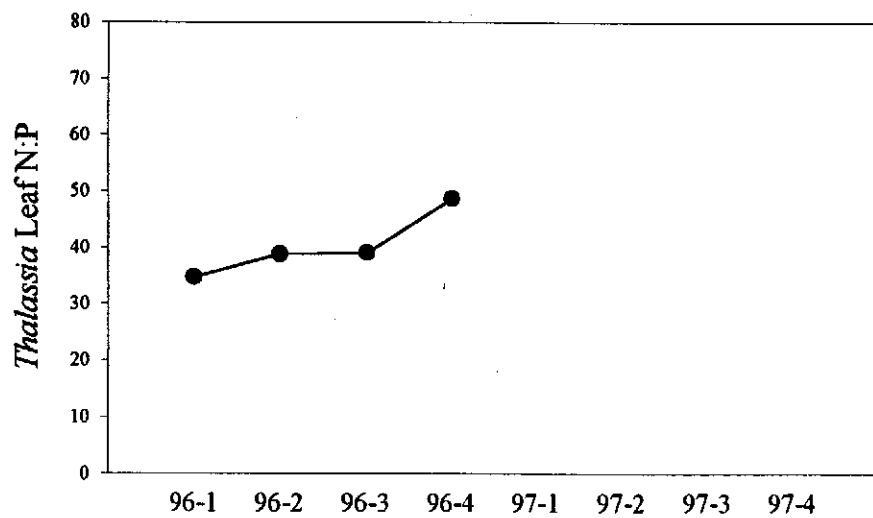
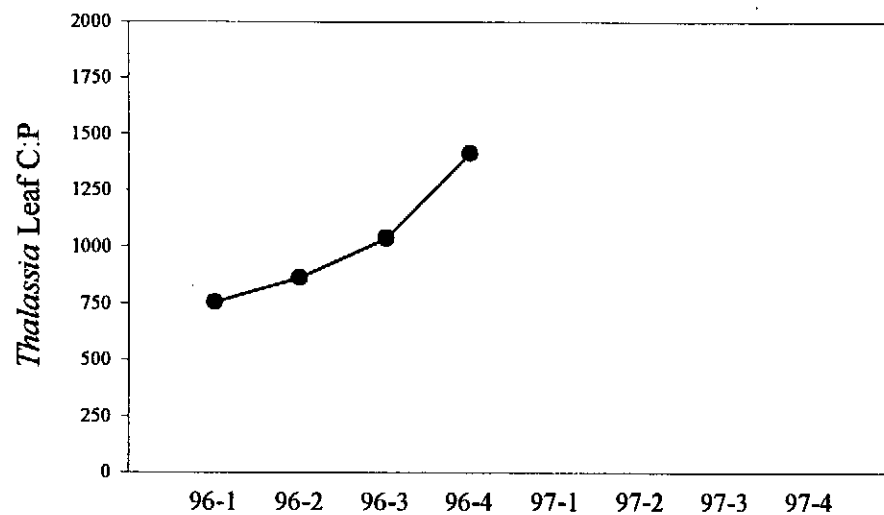
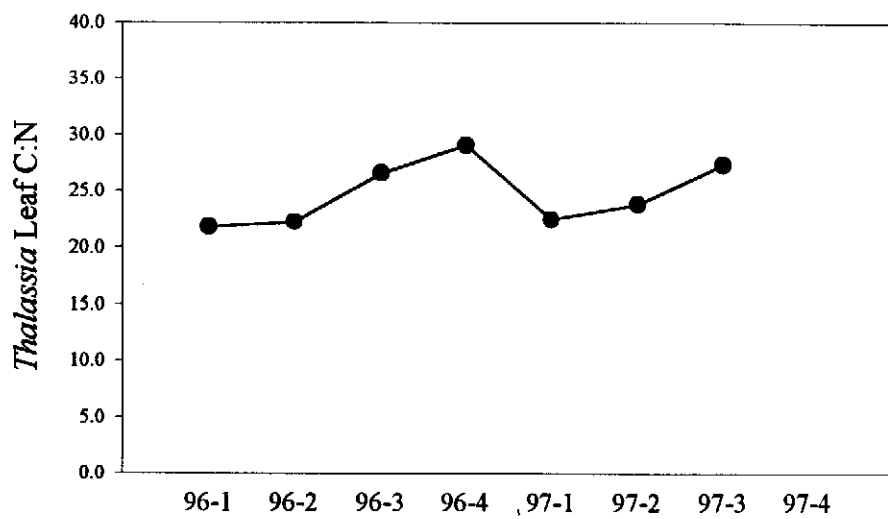


Figure 11d. Site 237. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 11e. Site 237. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

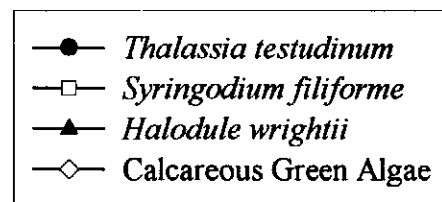
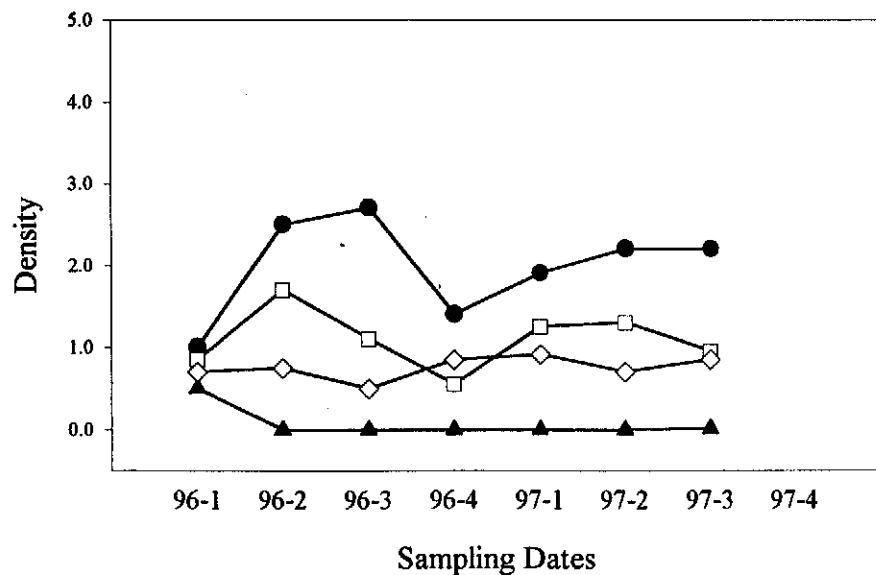
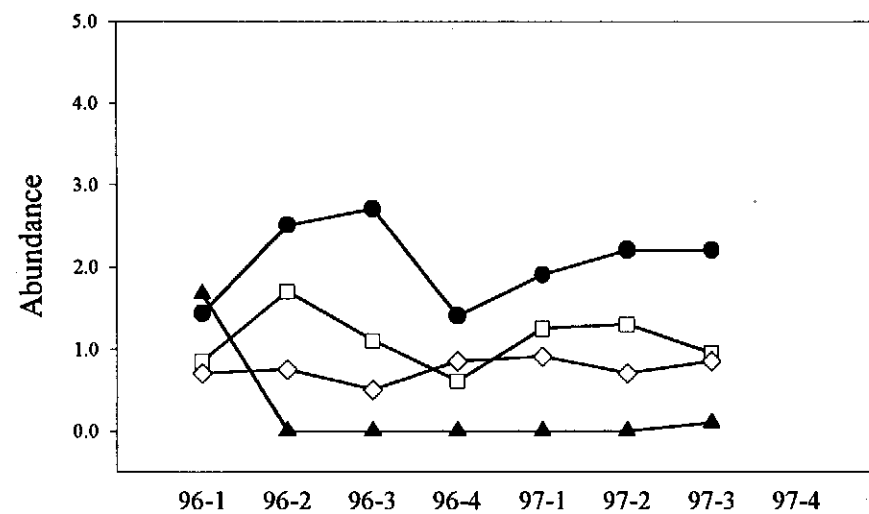
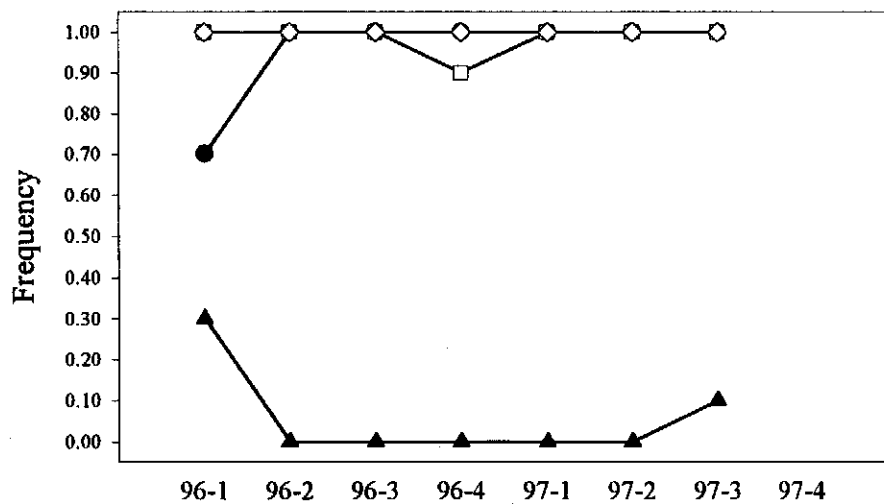
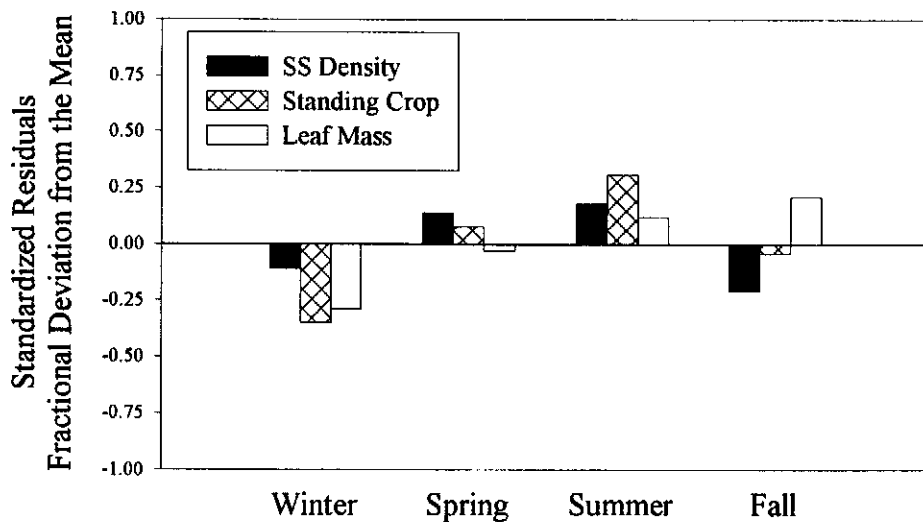
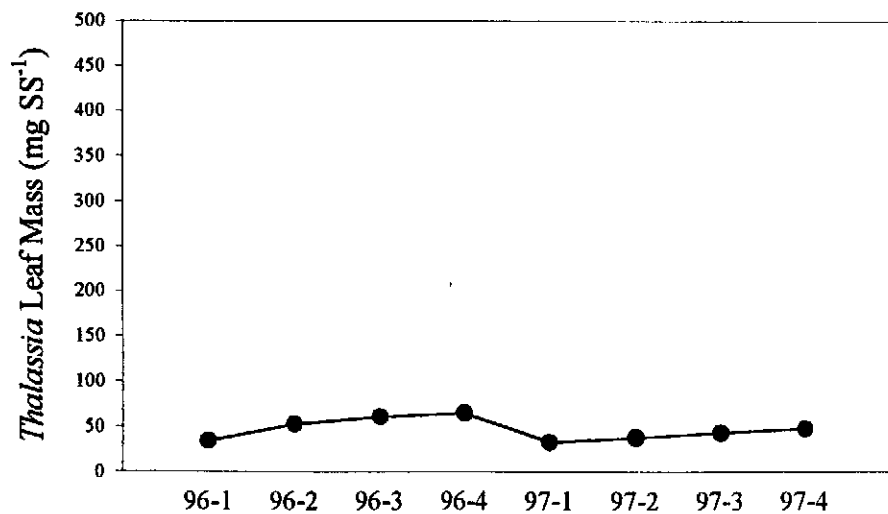
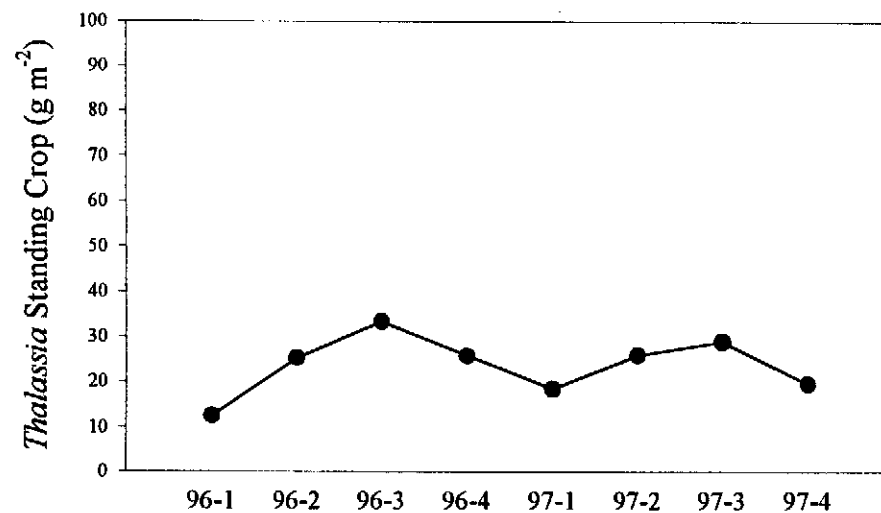
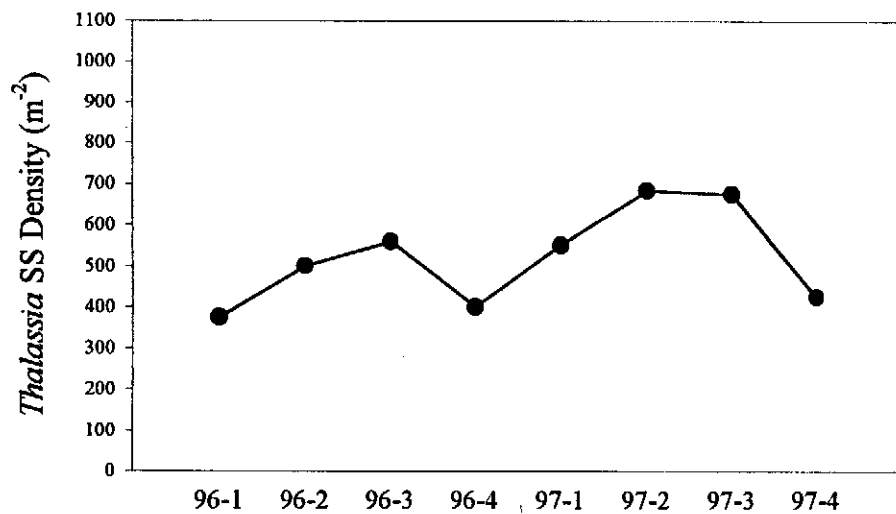
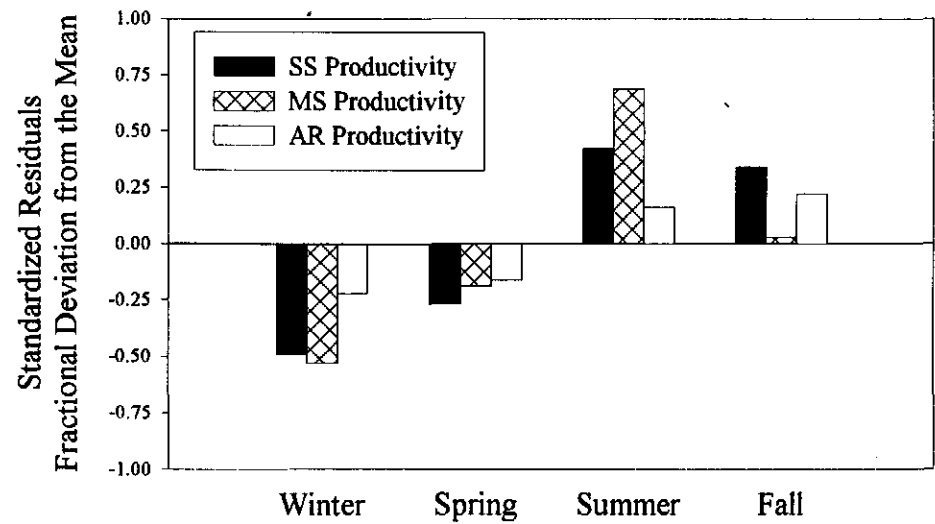
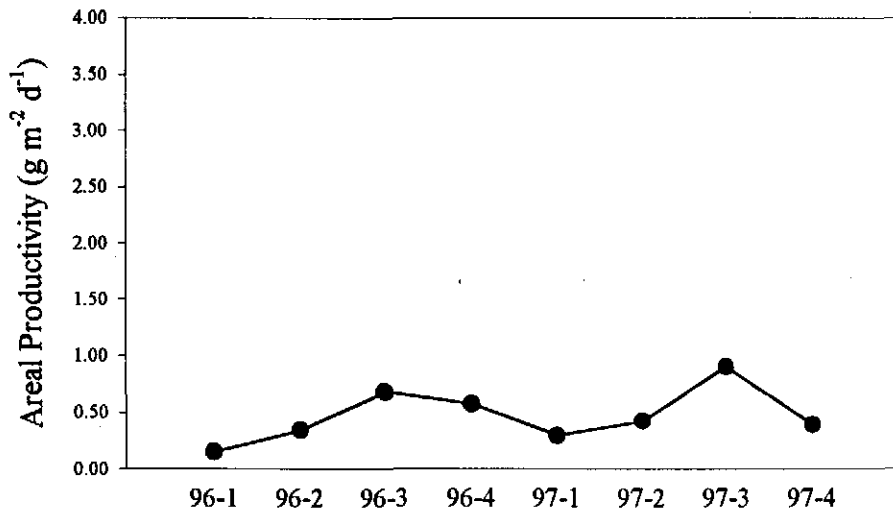
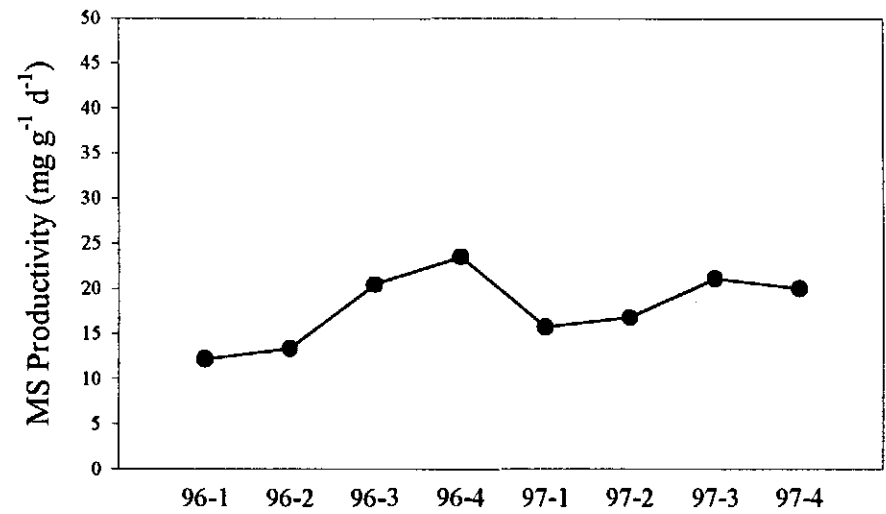
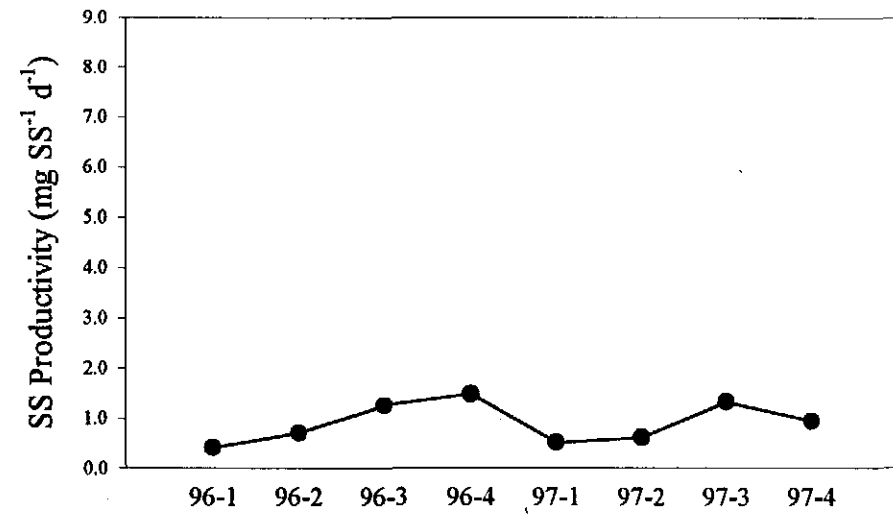


Figure 12a. Site 239. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 12b. Site 239. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 12c. Site 239. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

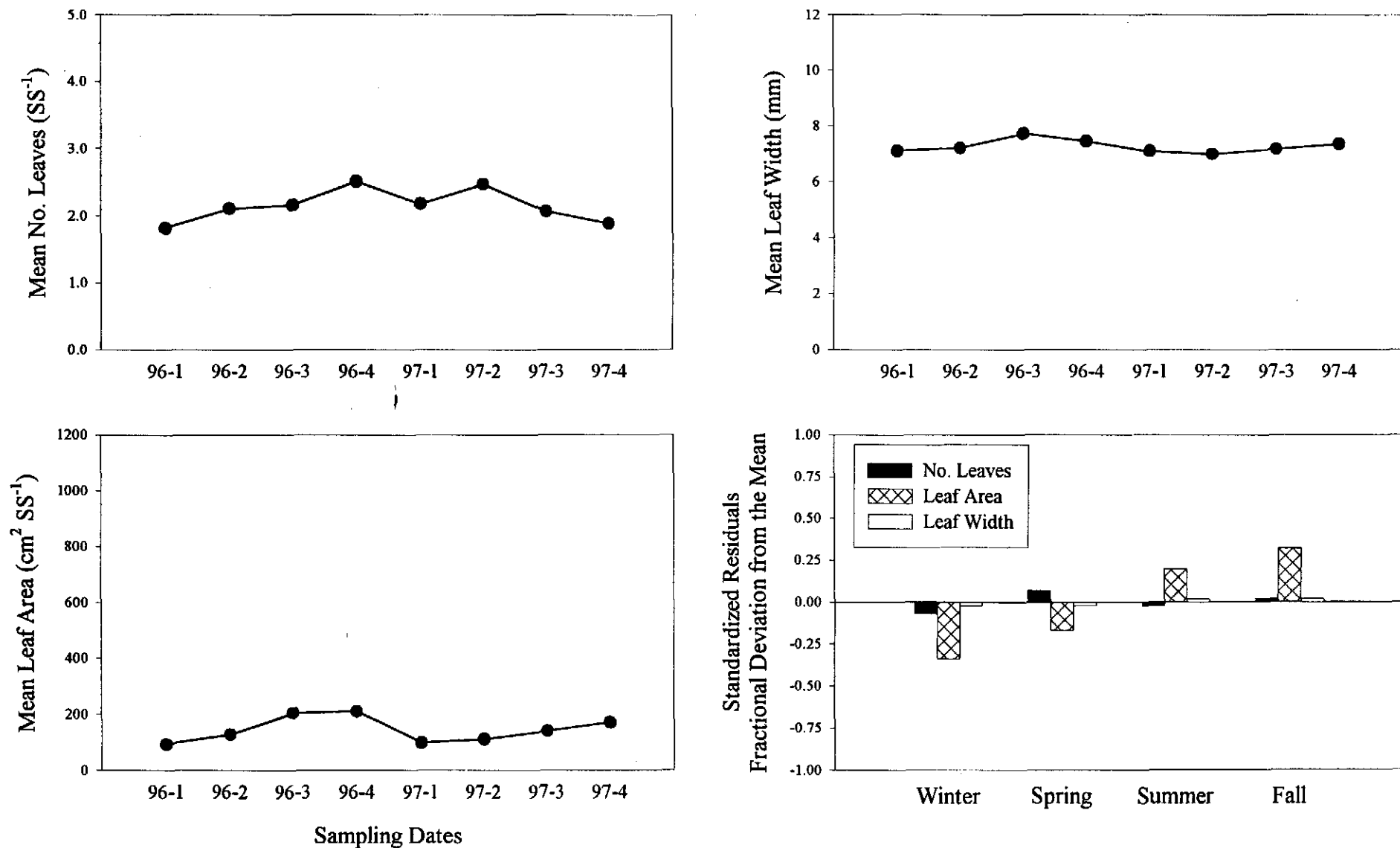
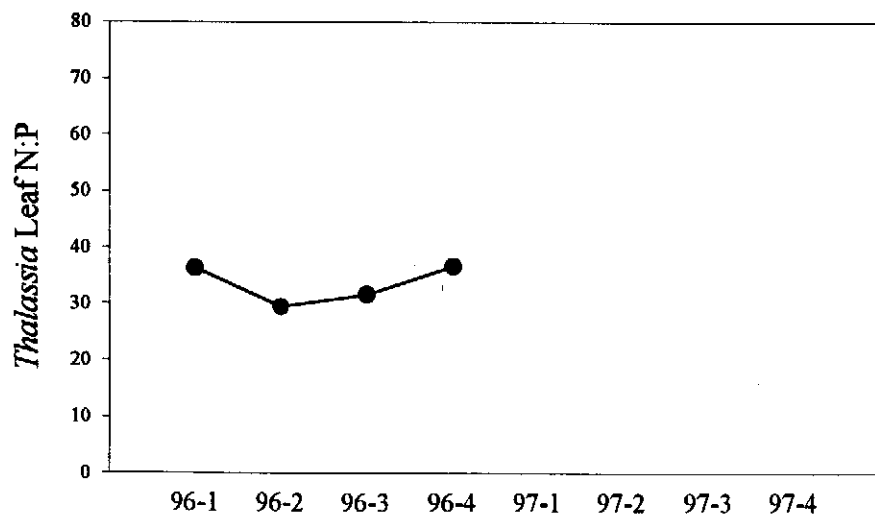
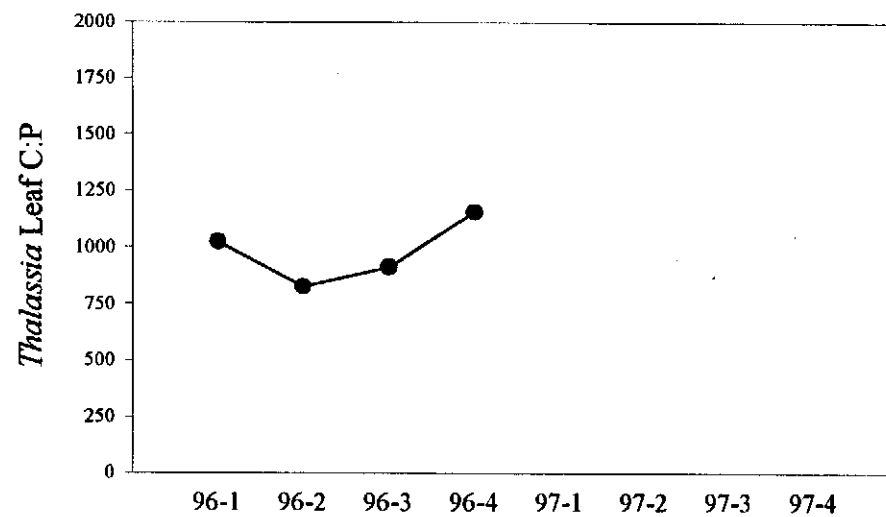
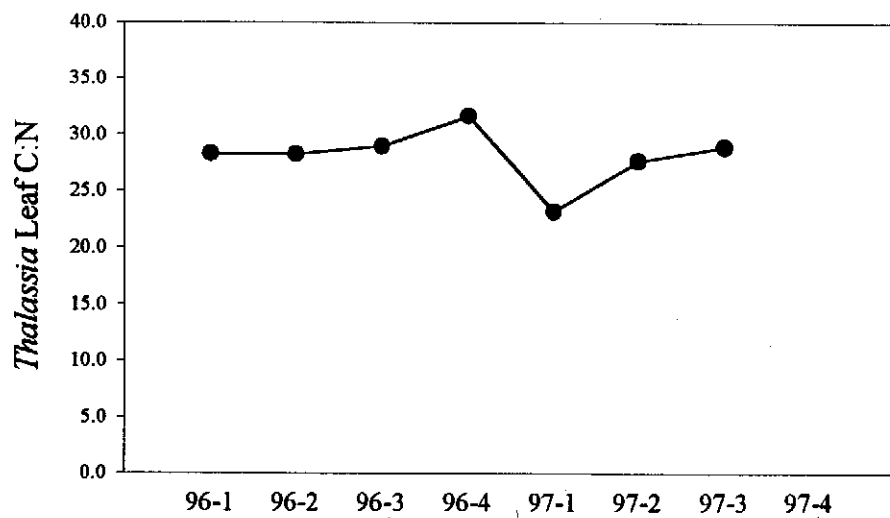
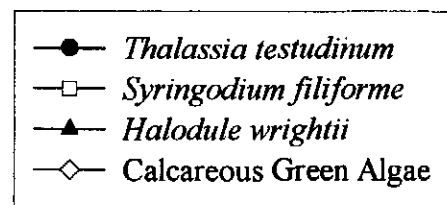
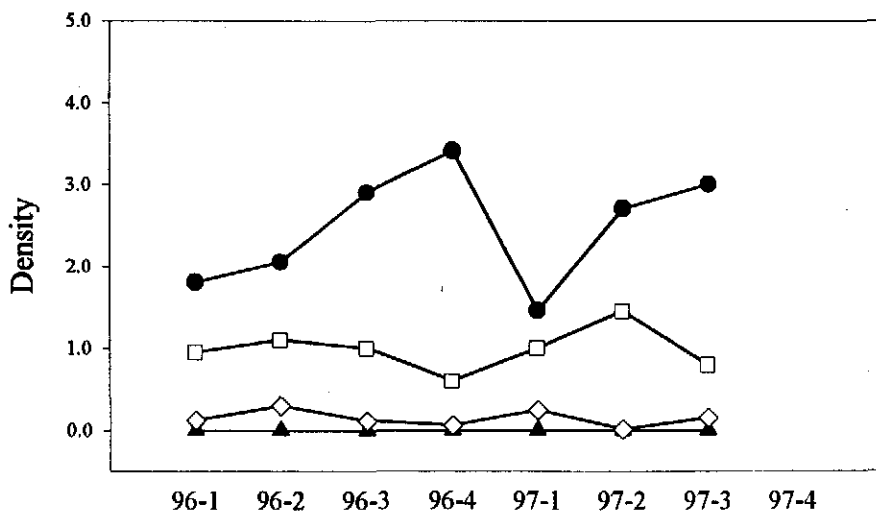
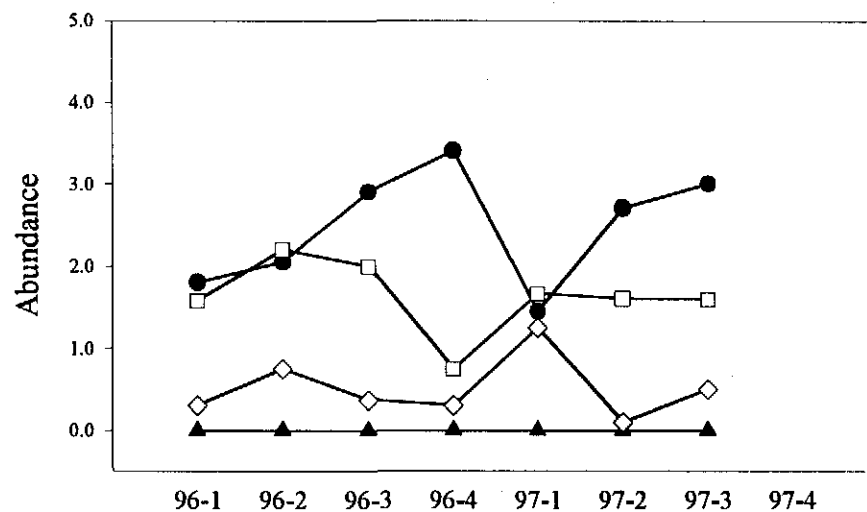
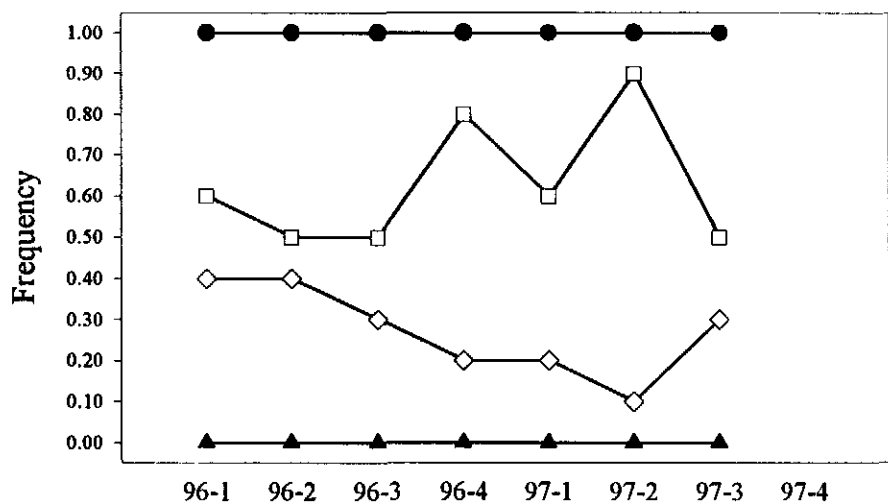


Figure 12d. Site 239. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



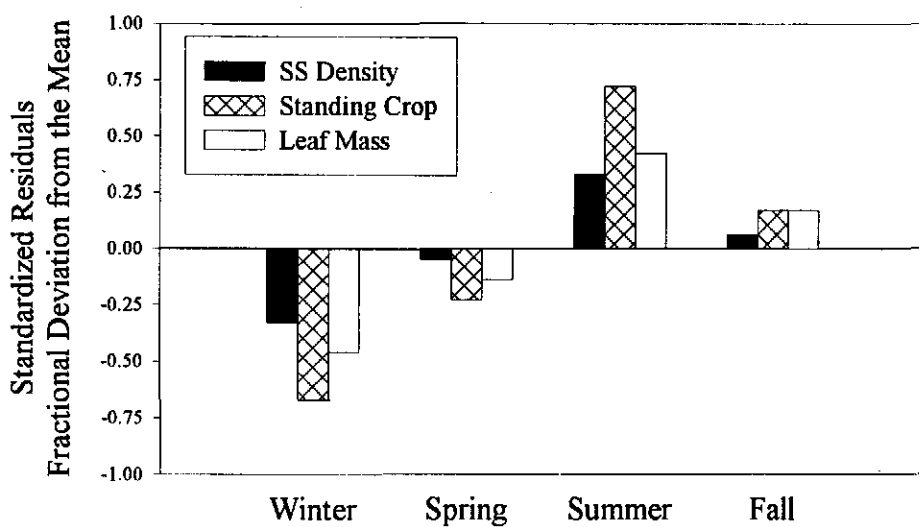
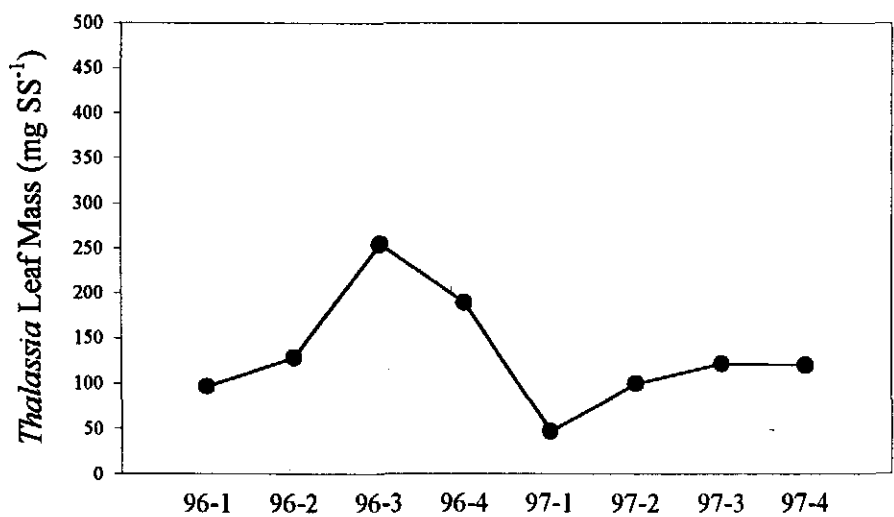
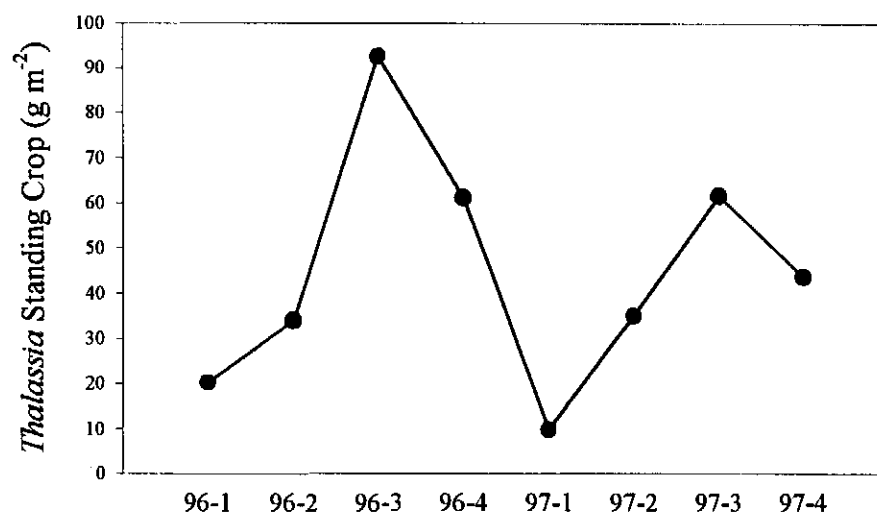
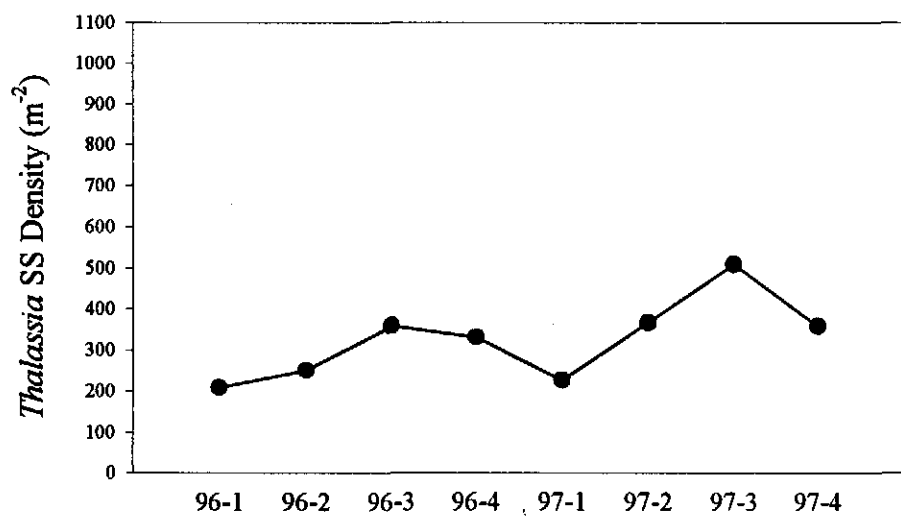
Sampling Dates

Figure 12e. Site 239. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



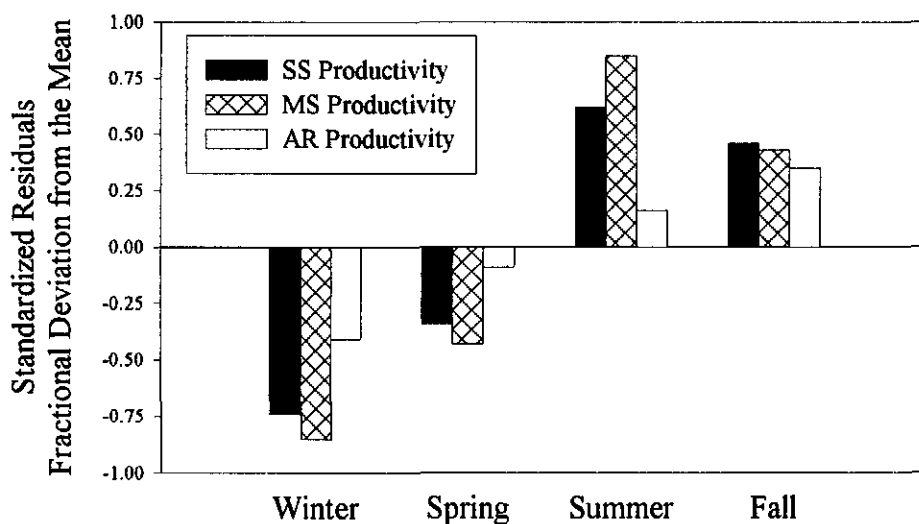
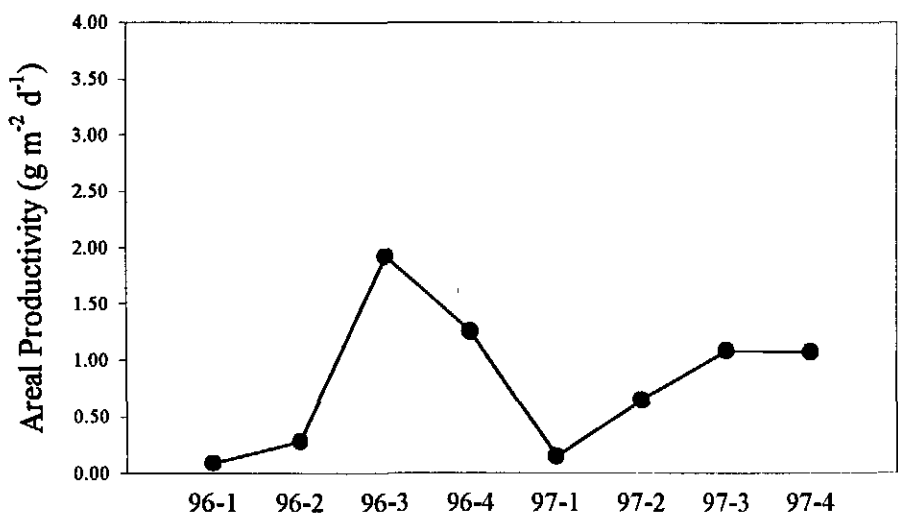
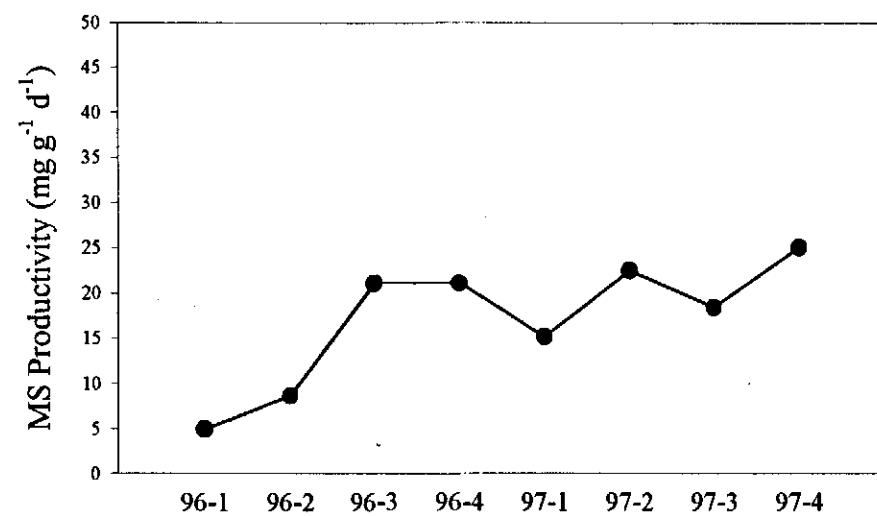
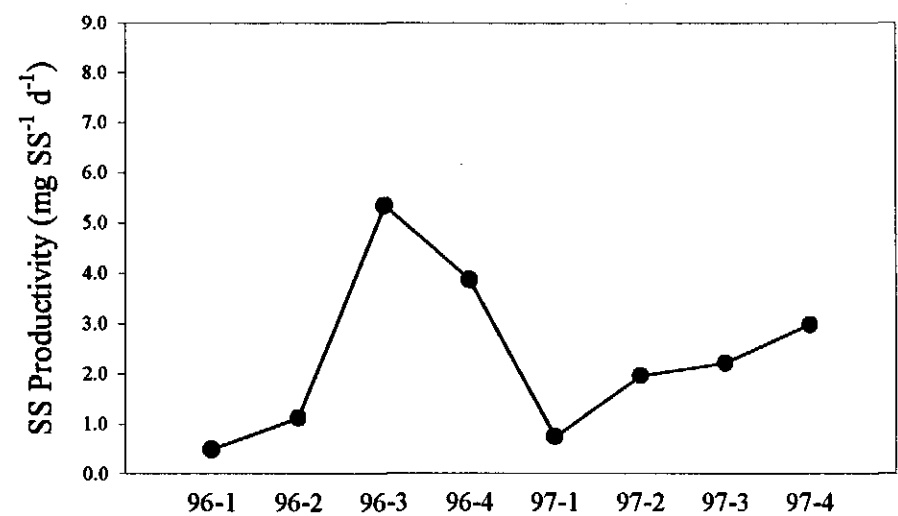
Sampling Dates

Figure 13a. Site 241. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 13b. Site 241. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 13c. Site 241. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

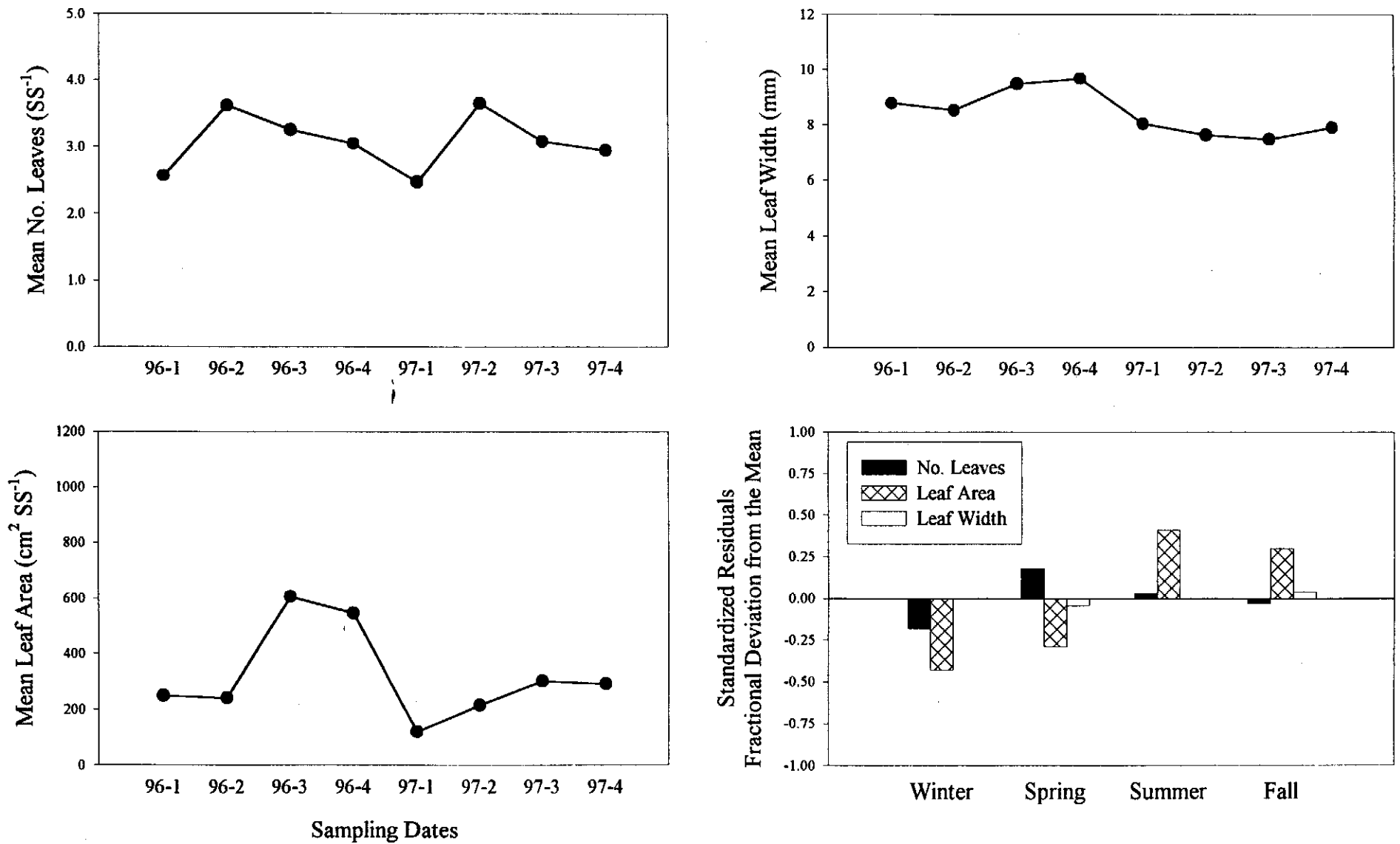
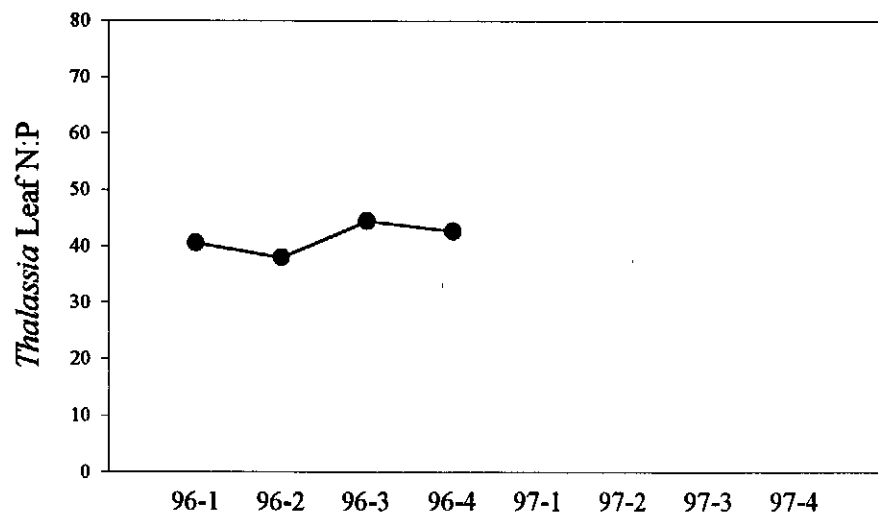
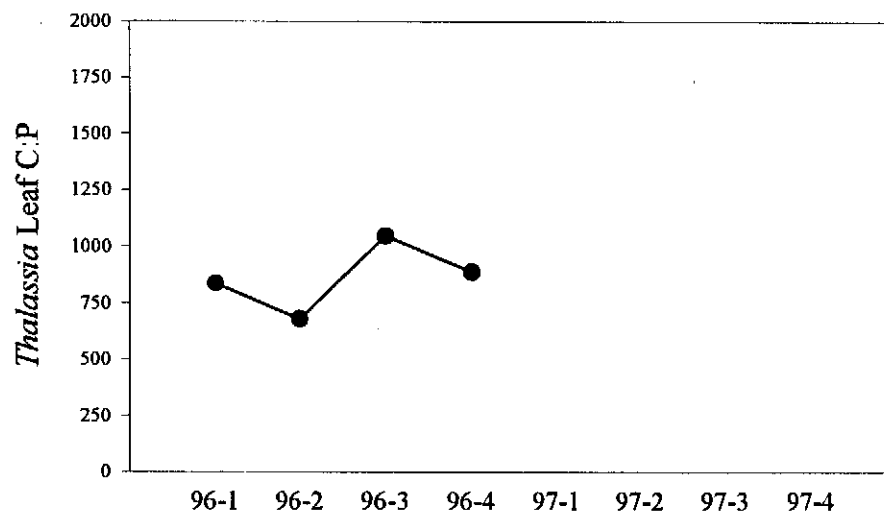
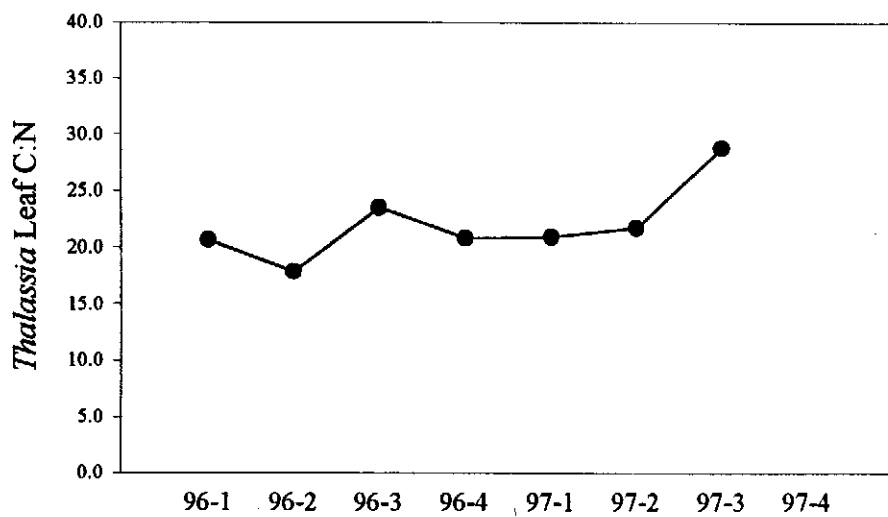
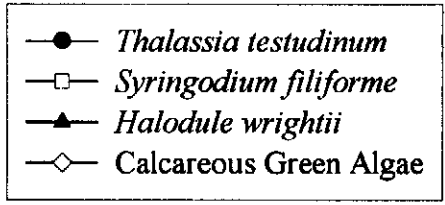
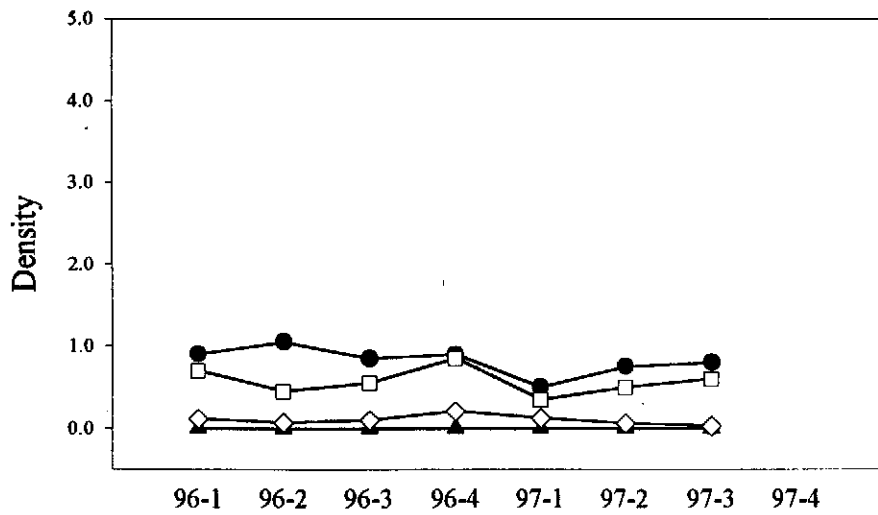
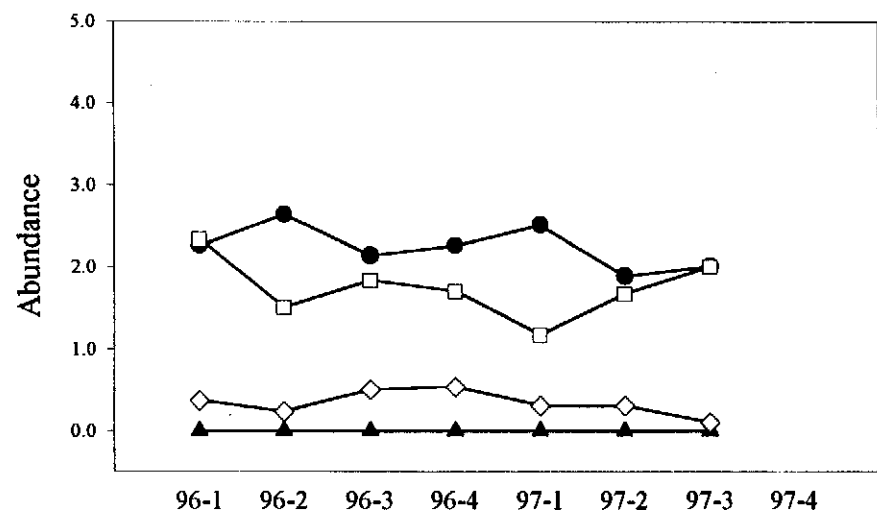
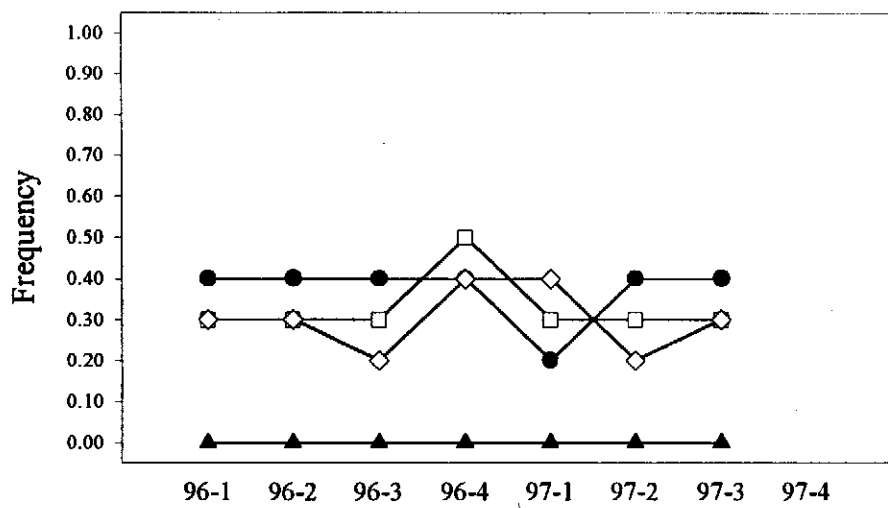


Figure 13d. Site 241. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



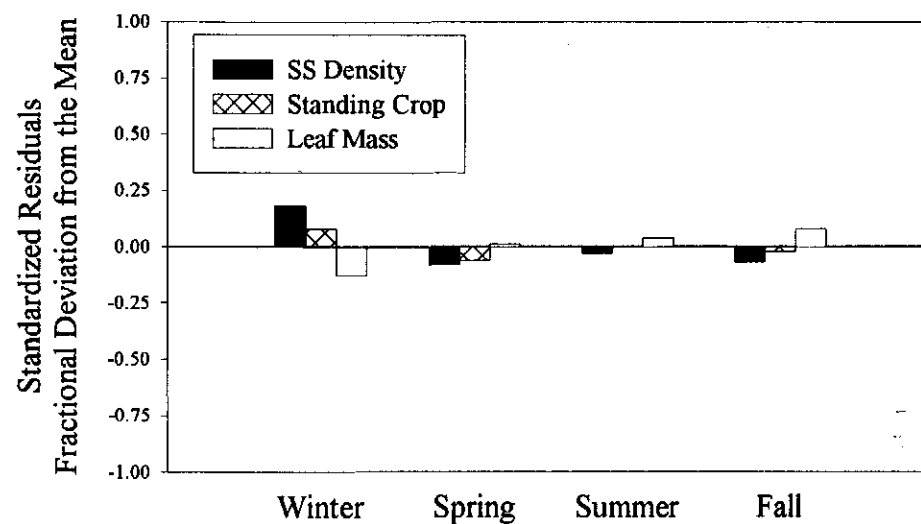
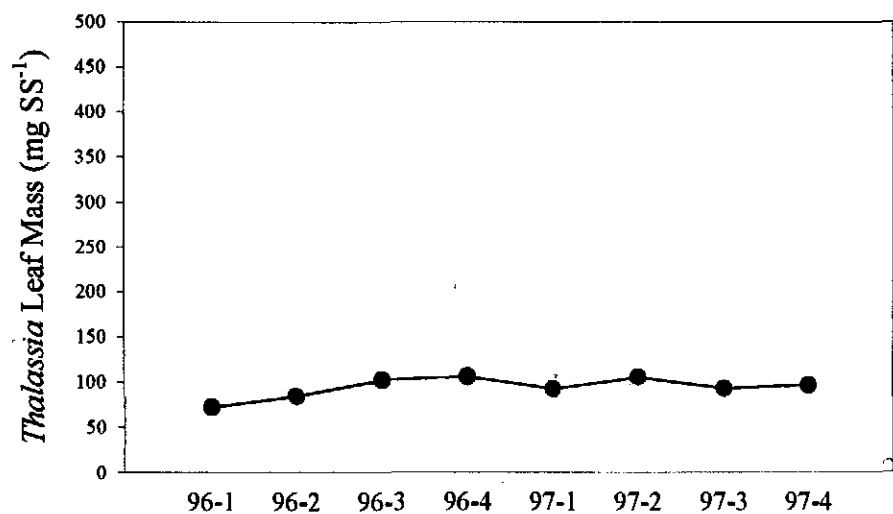
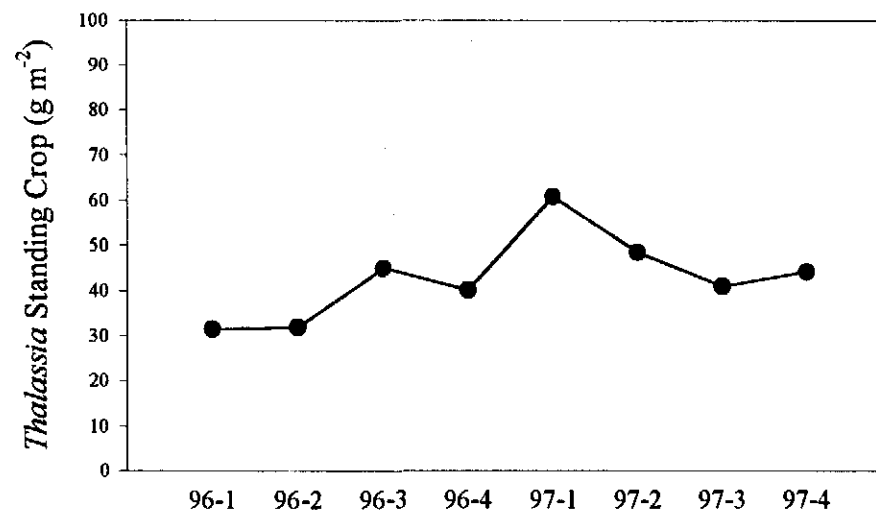
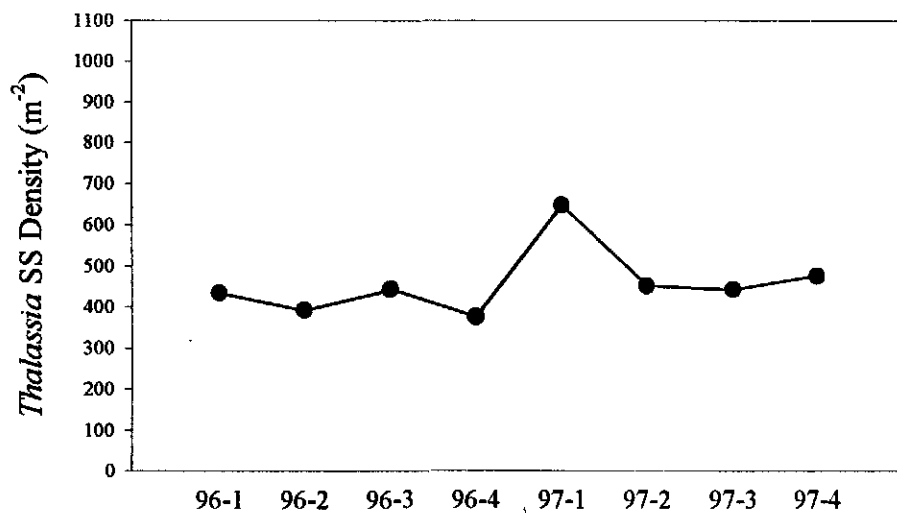
Sampling Dates

Figure 13e. Site 241. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



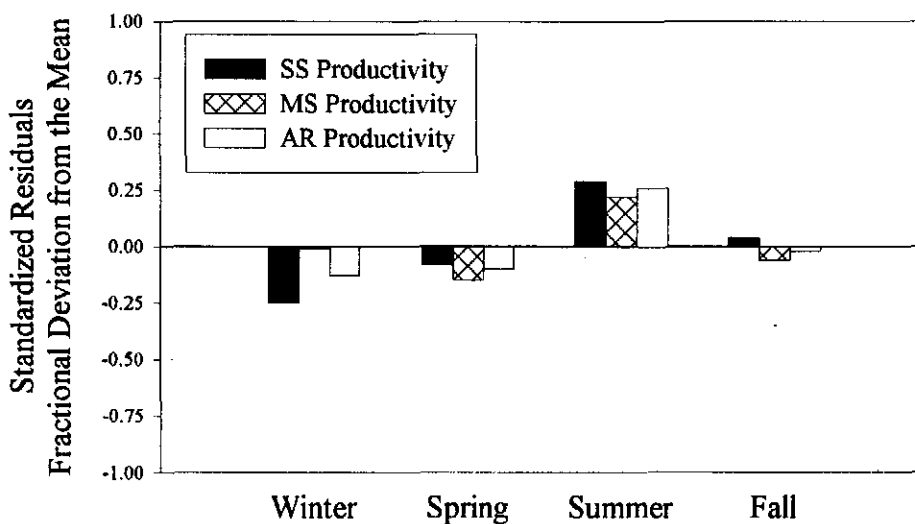
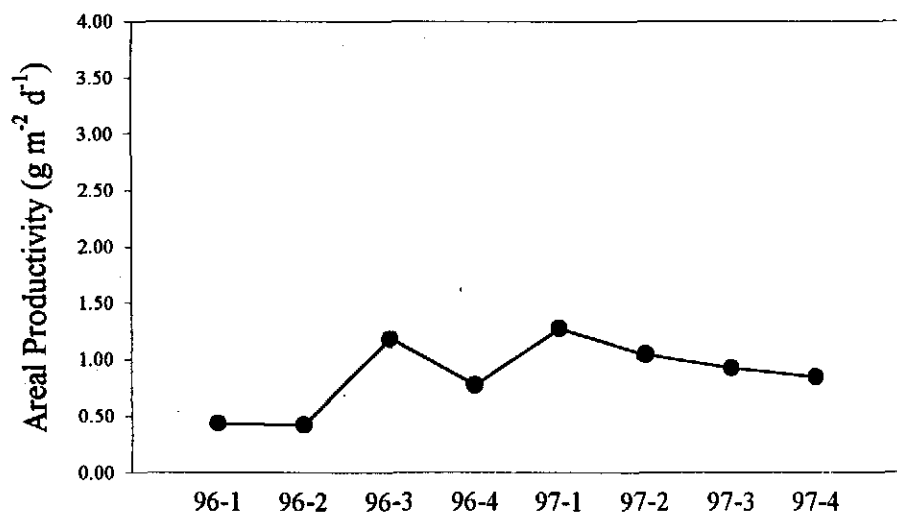
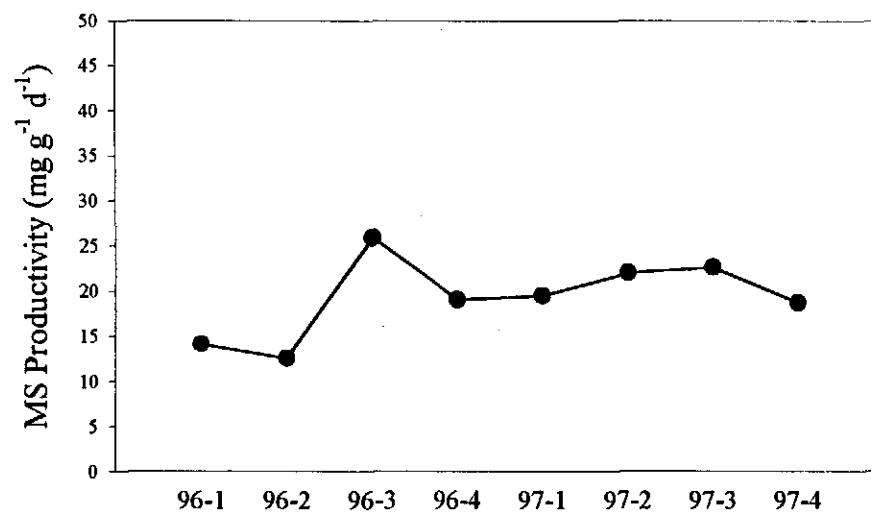
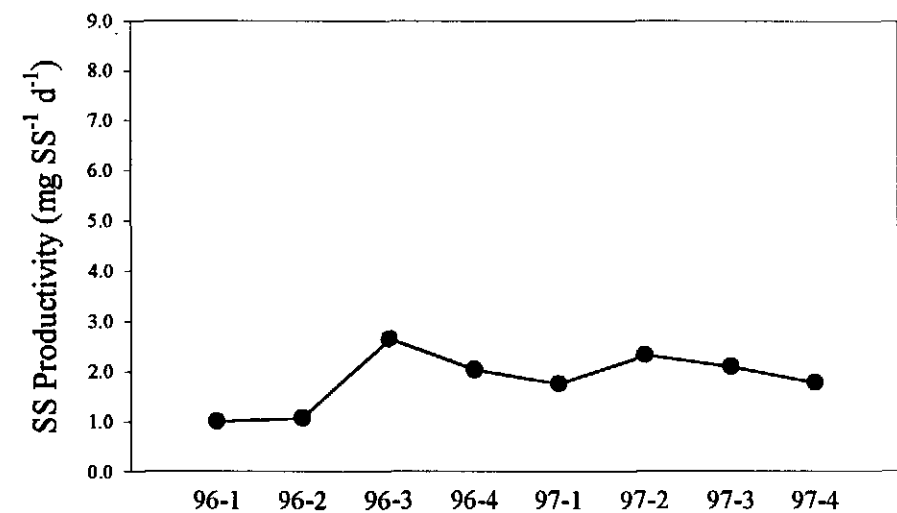
Sampling Dates

Figure 14a. Site 243. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 14b. Site 243. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 14c. Site 243. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

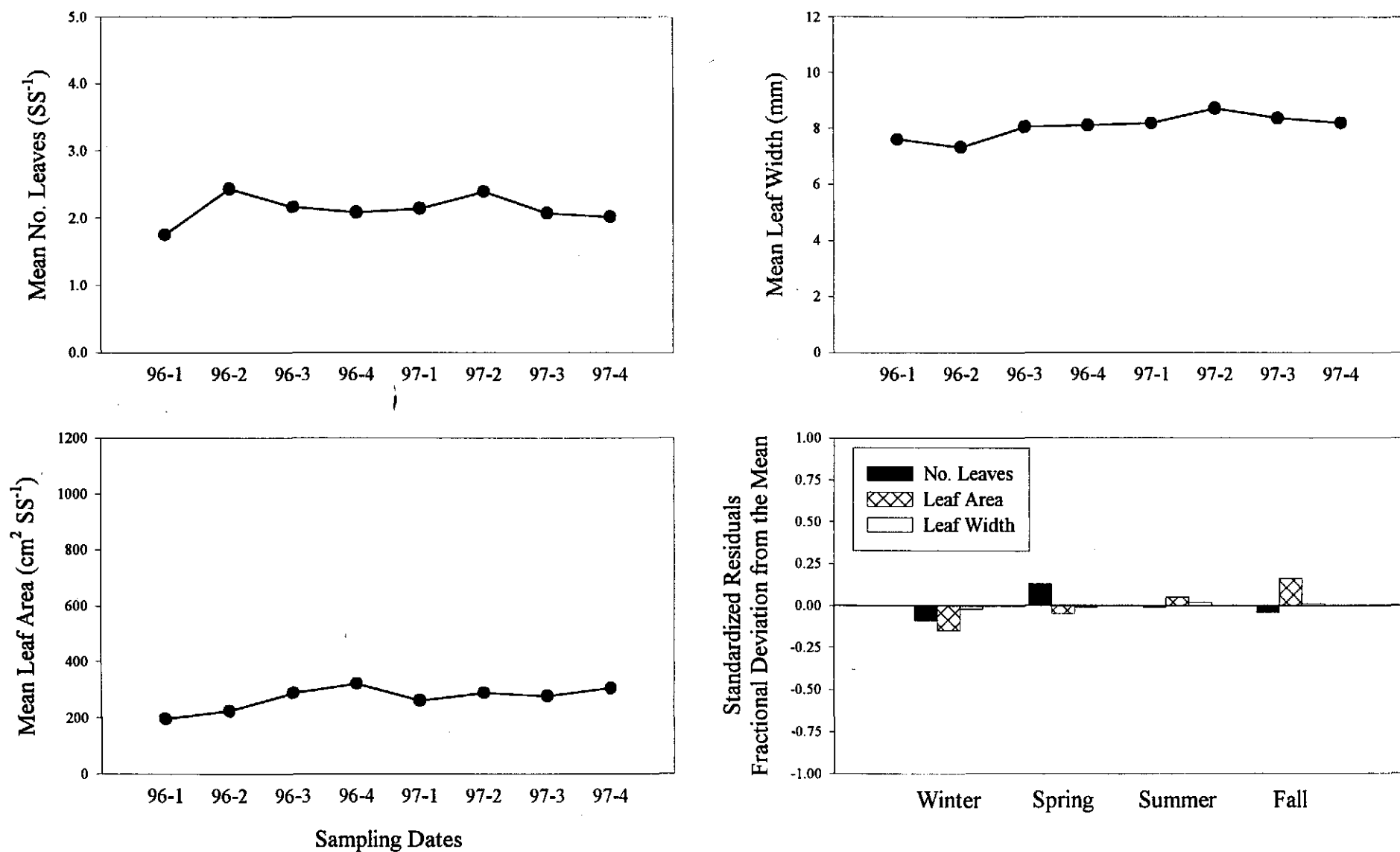
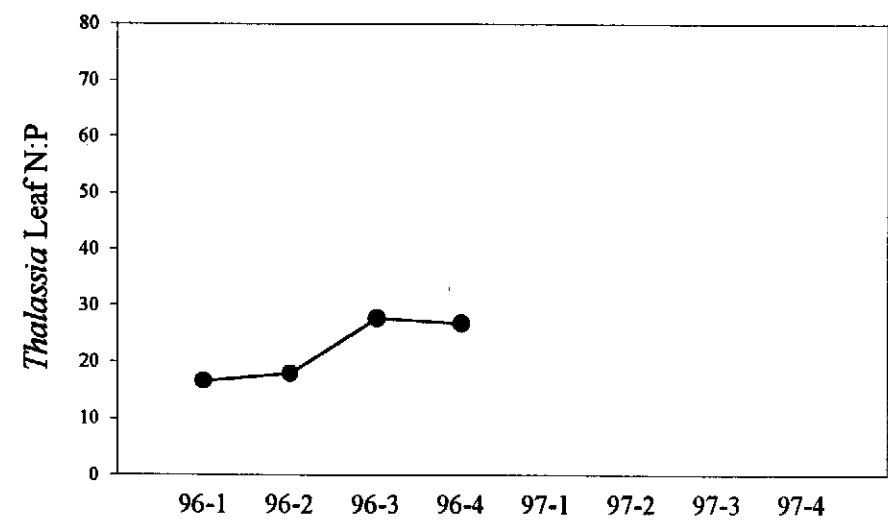
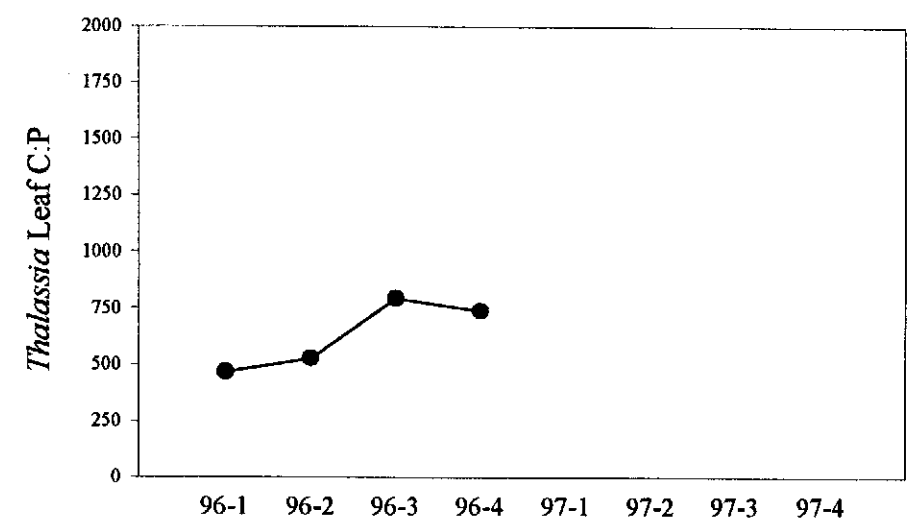
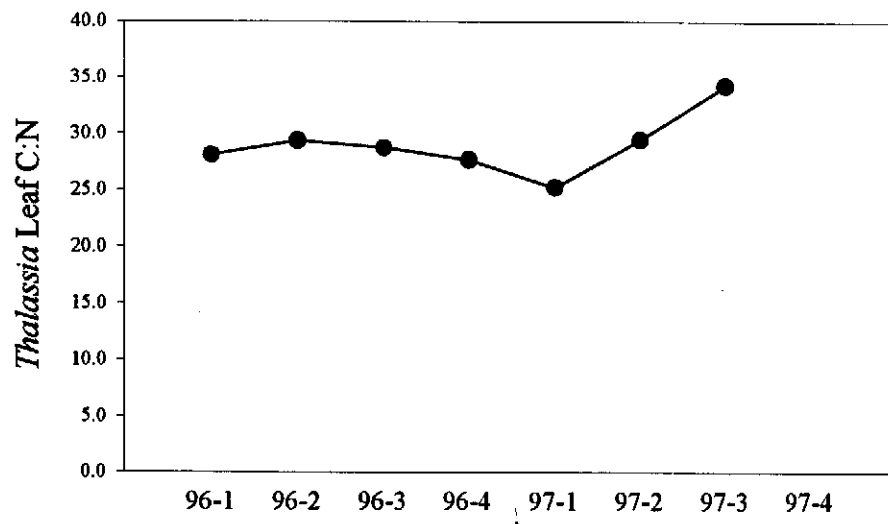
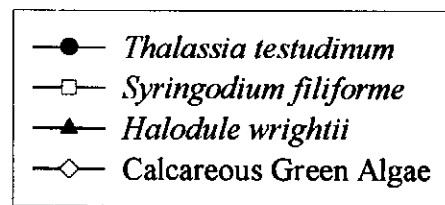
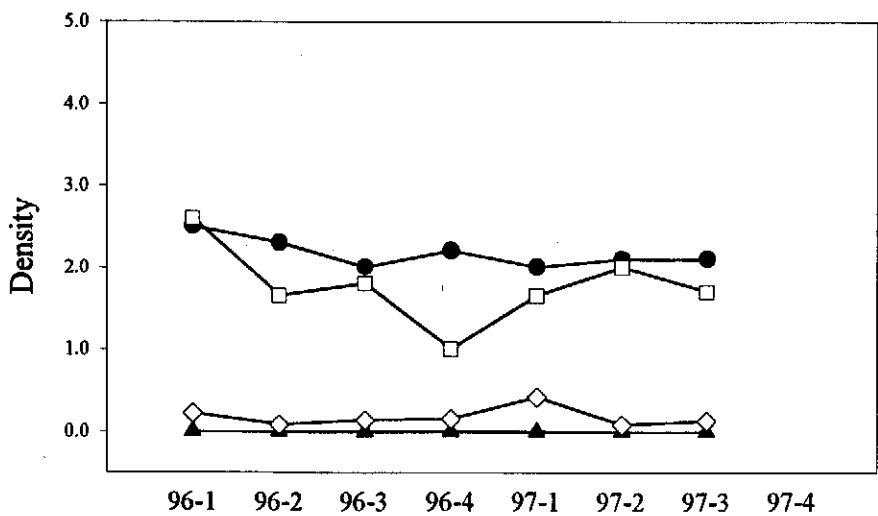
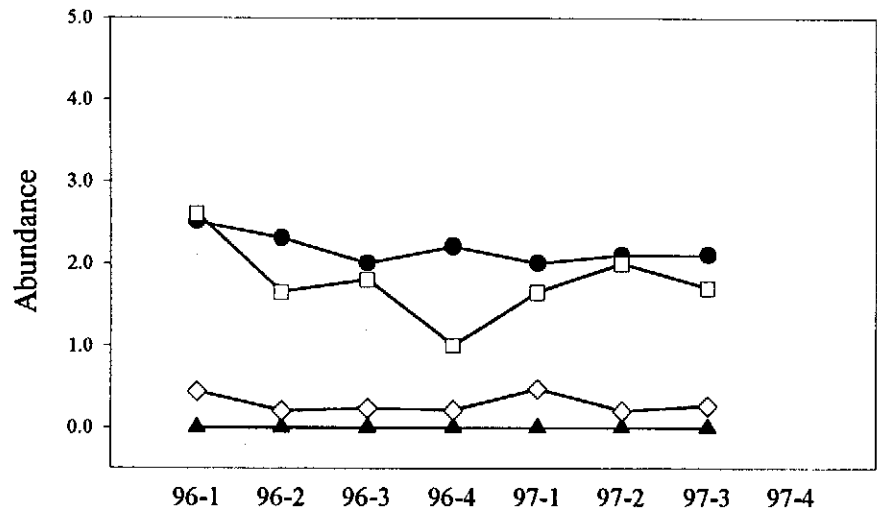
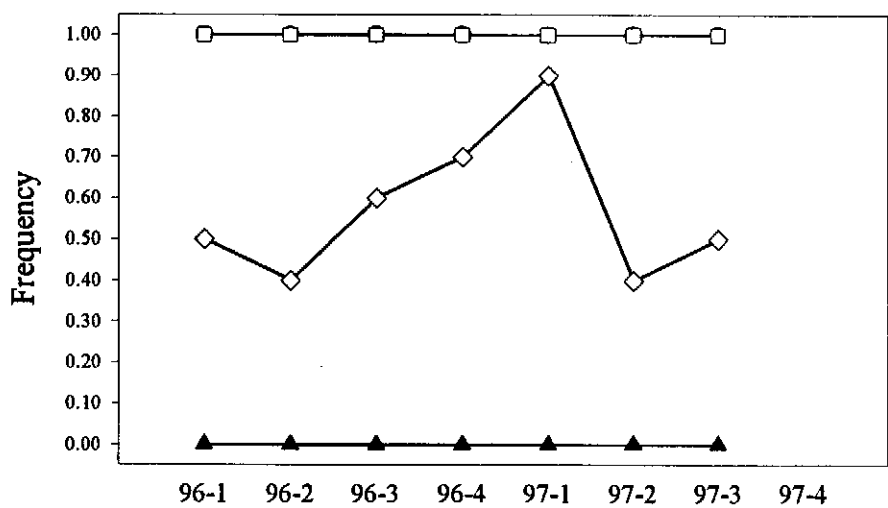


Figure 14d. Site 243. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



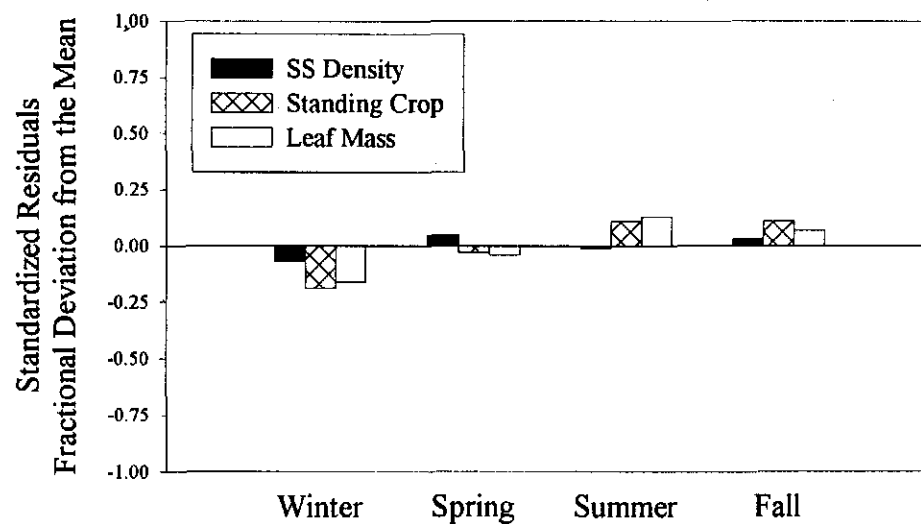
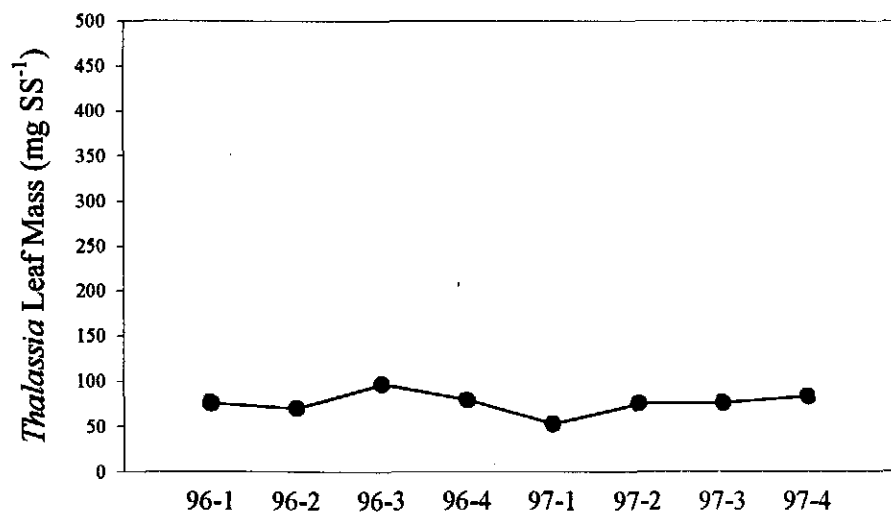
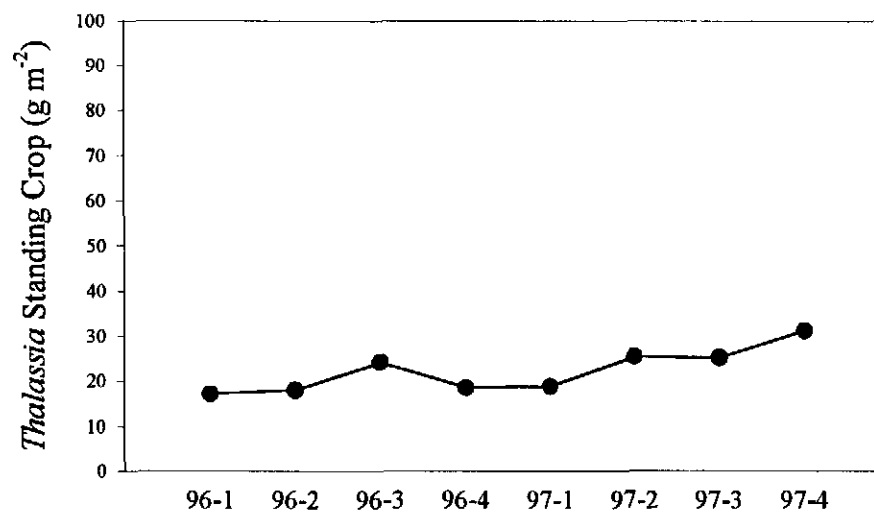
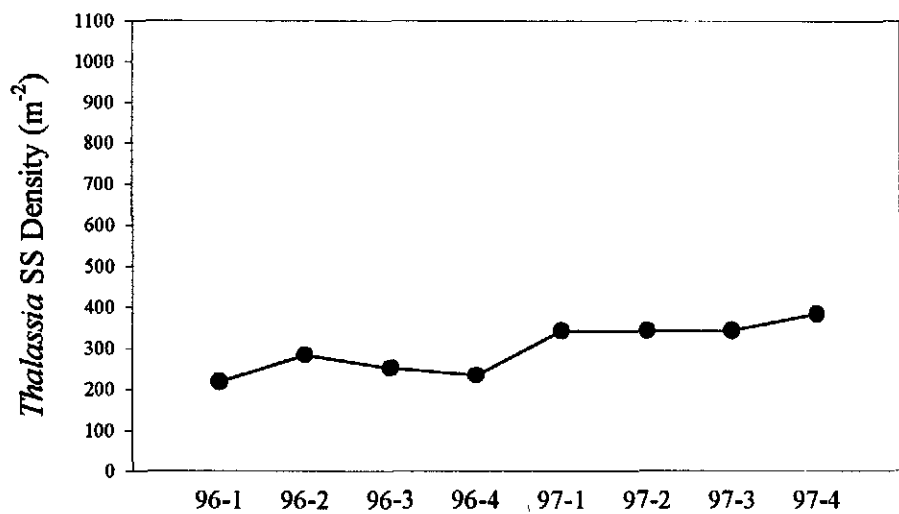
Sampling Dates

Figure 14e. Site 243. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



Sampling Dates

Figure 15a. Site 248. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 15b. Site 248. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

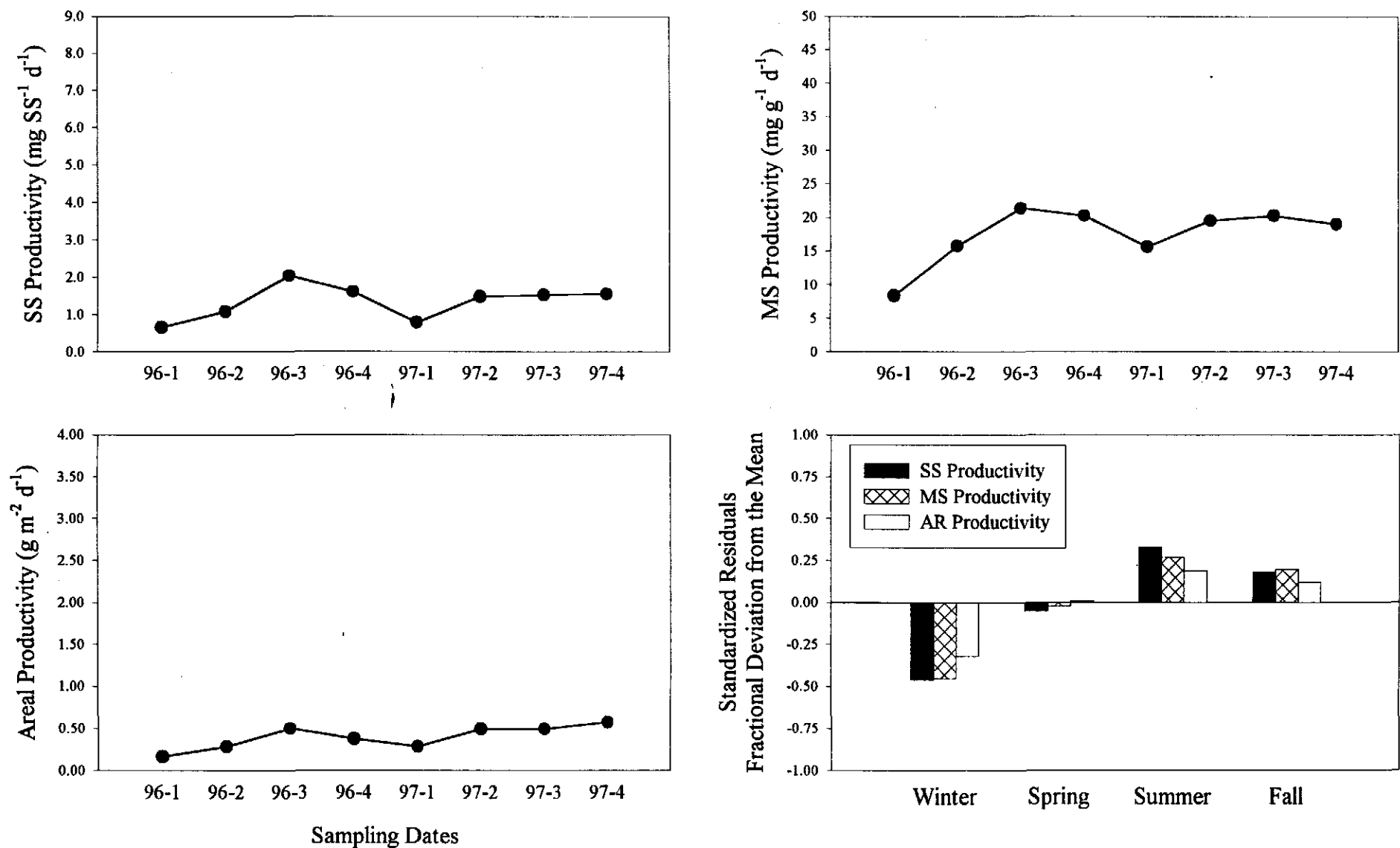


Figure 15c. Site 248. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

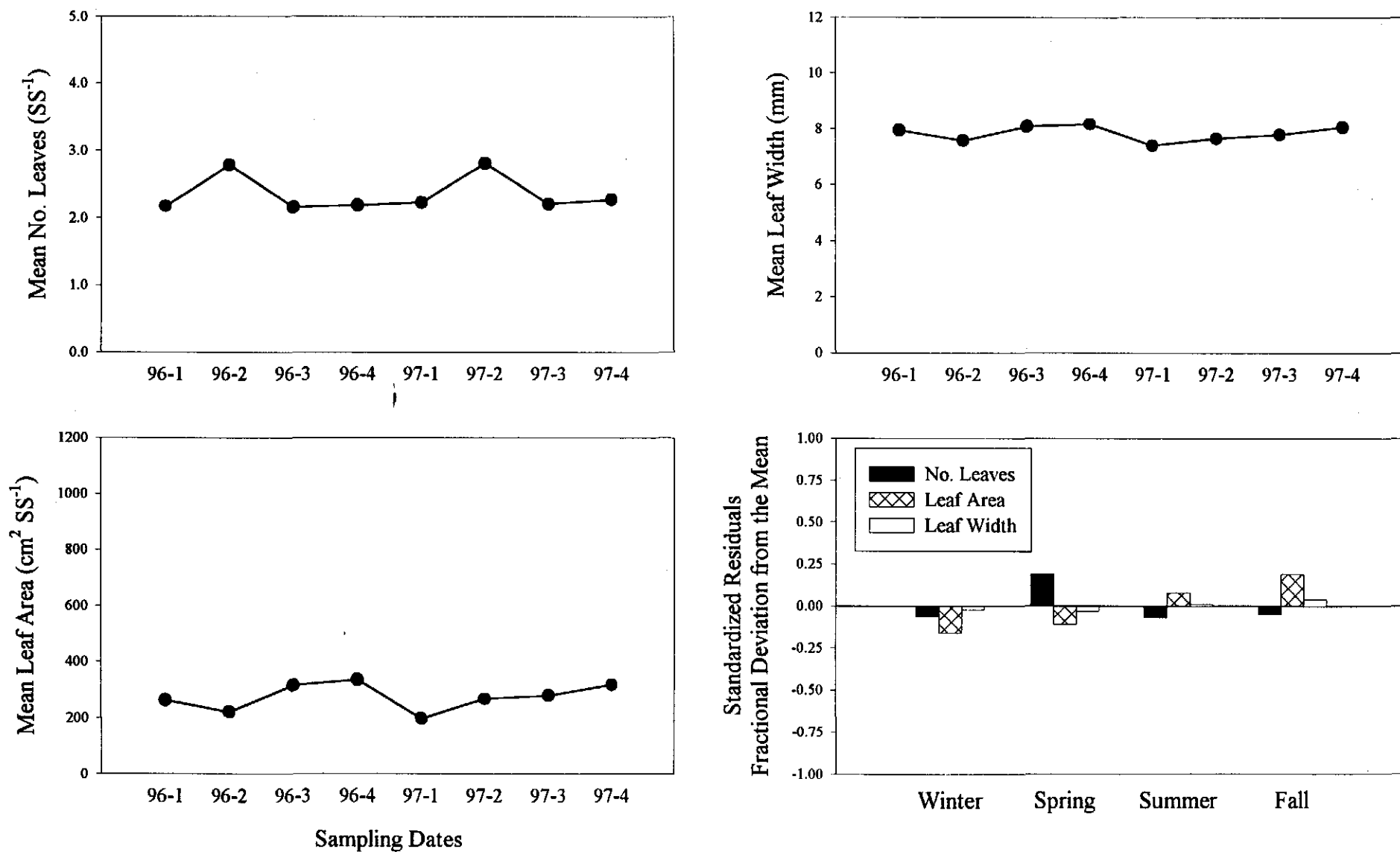
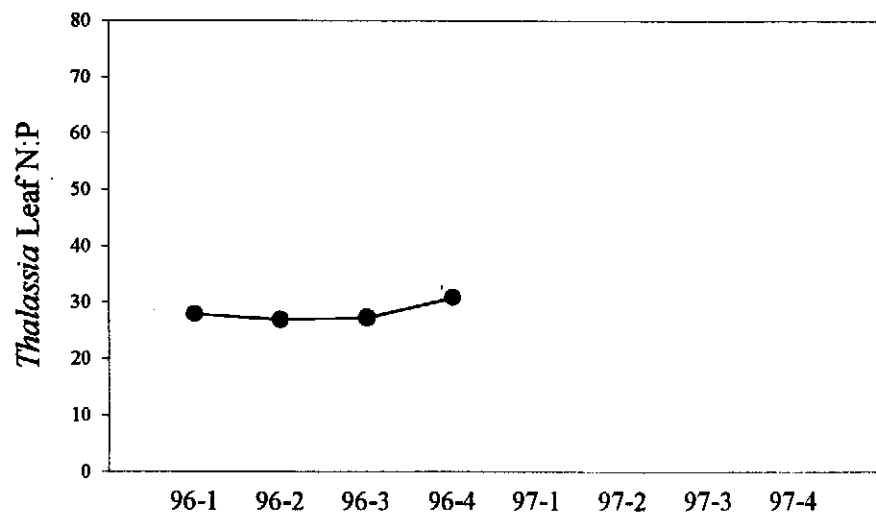
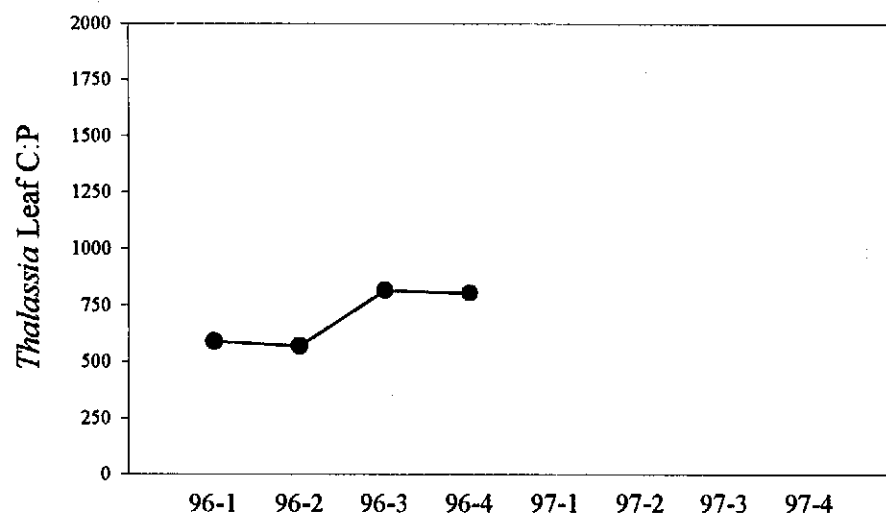
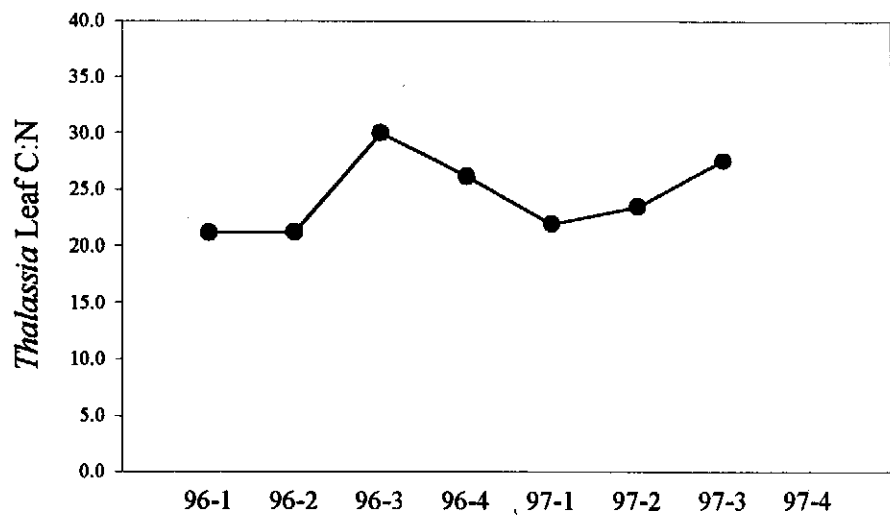


Figure 15d. Site 248. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 15e. Site 248. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

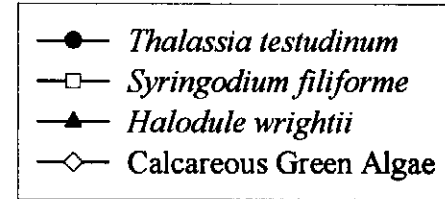
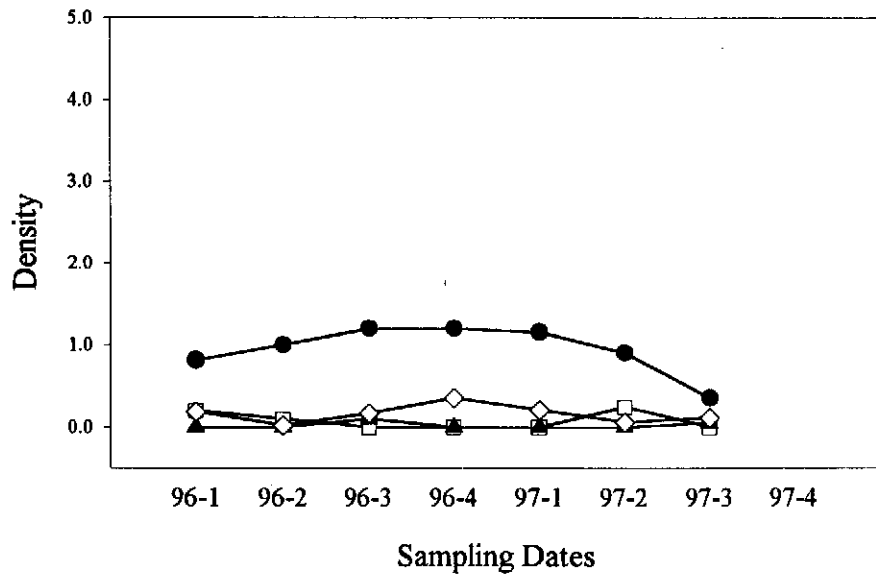
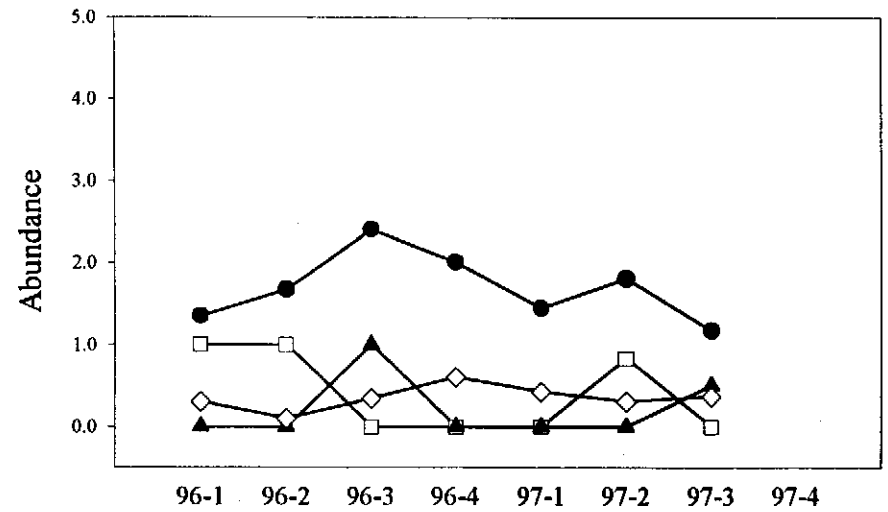
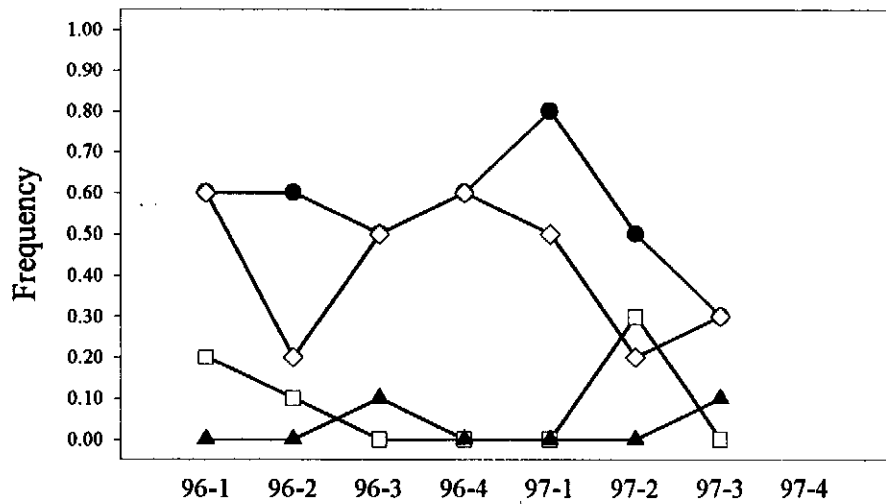
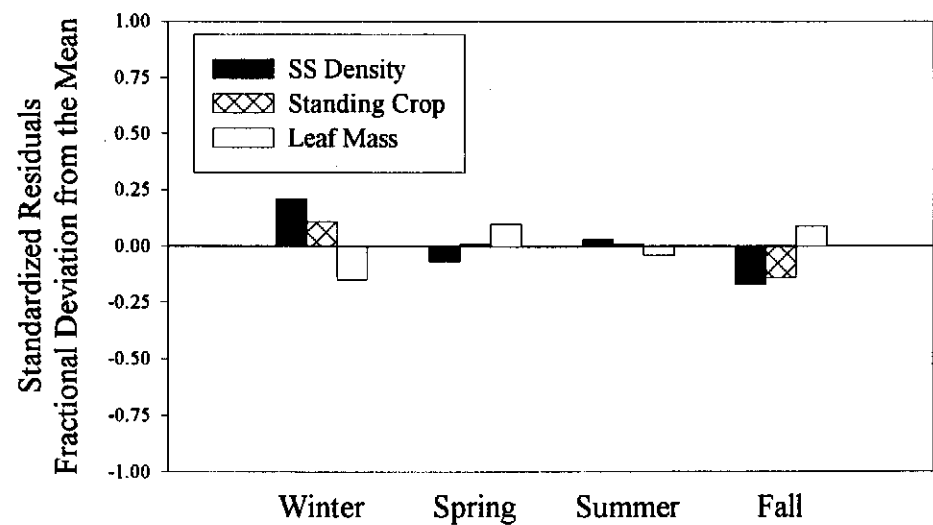
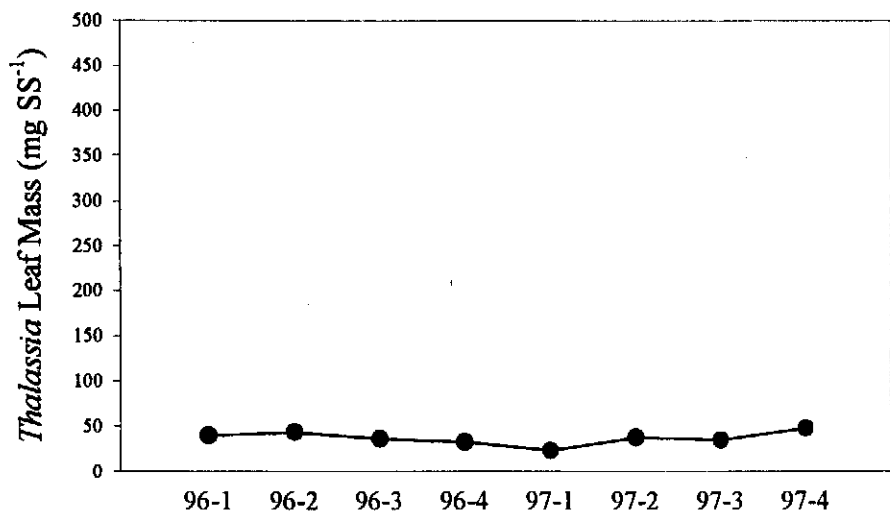
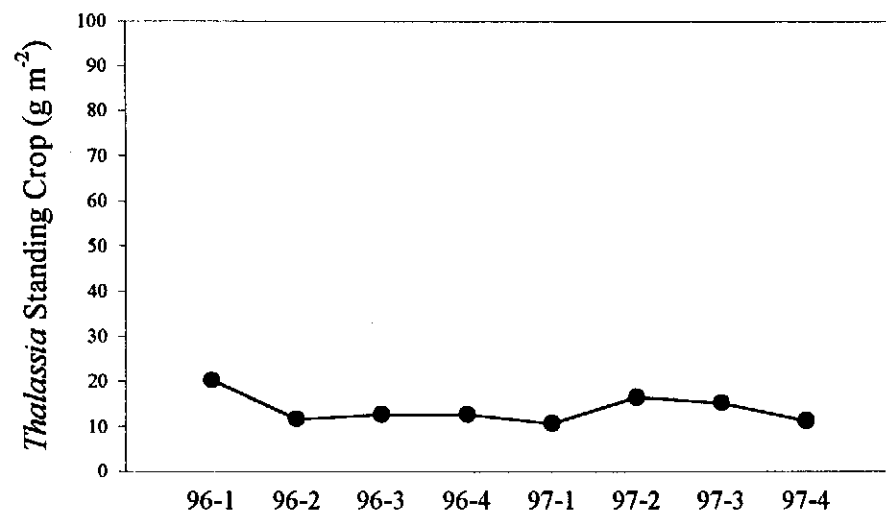
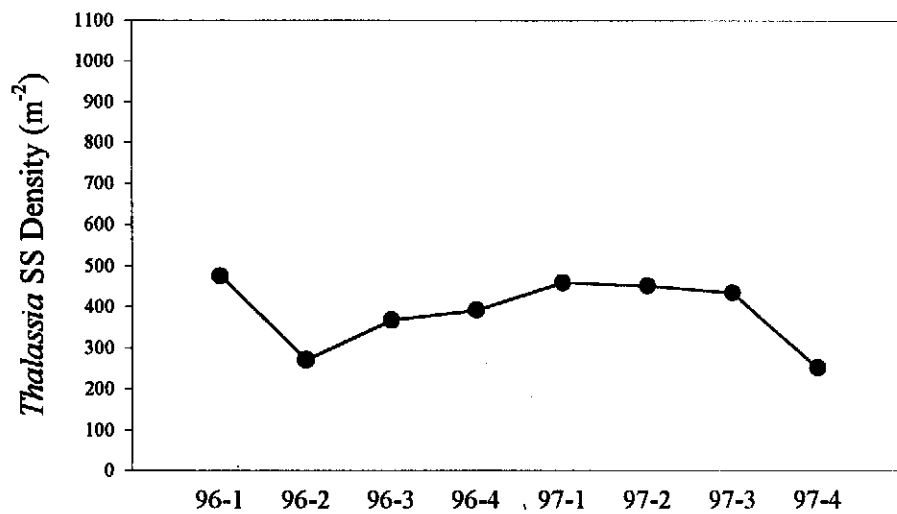
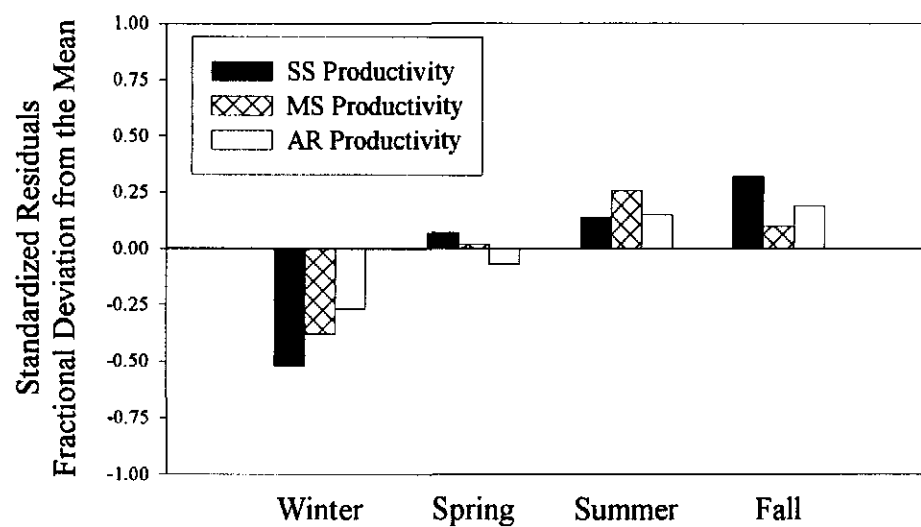
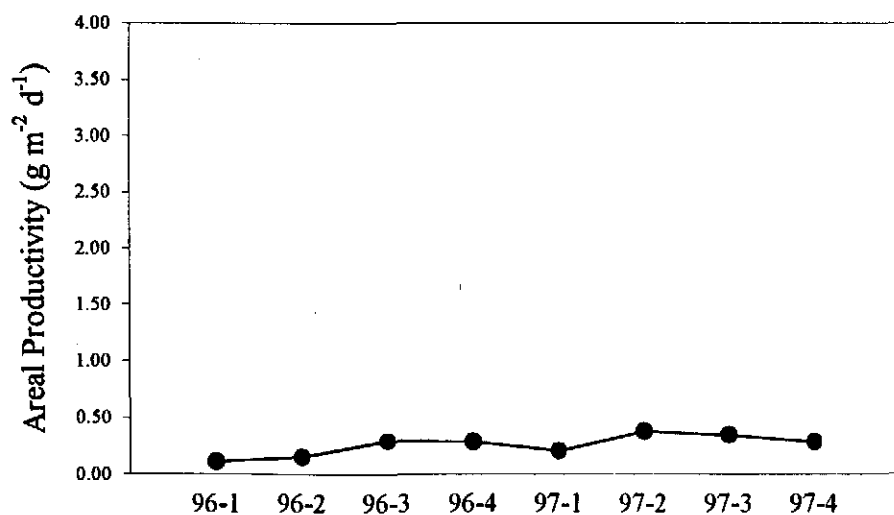
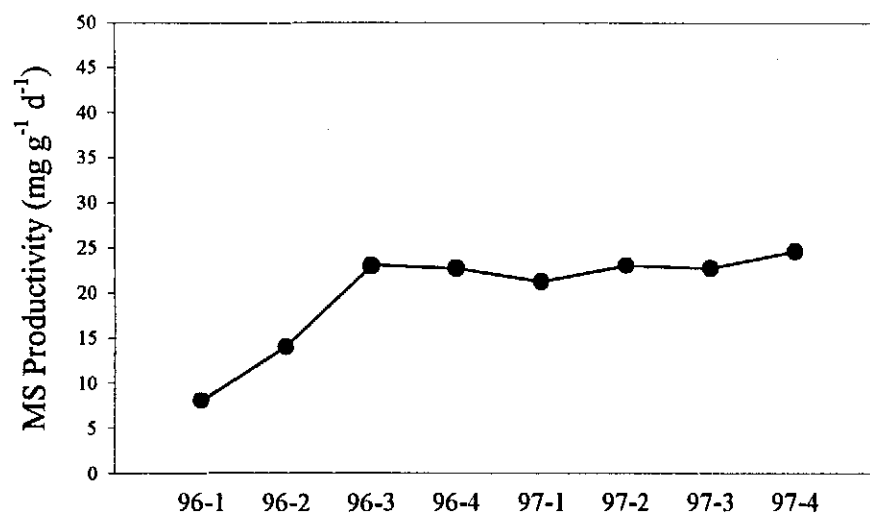
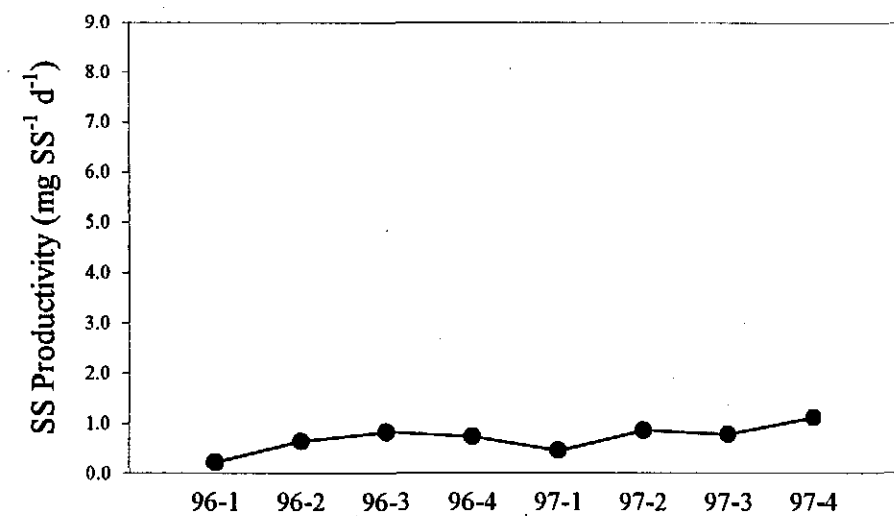


Figure 16a. Site 255. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 16b. Site 255. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 16c. Site 255. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

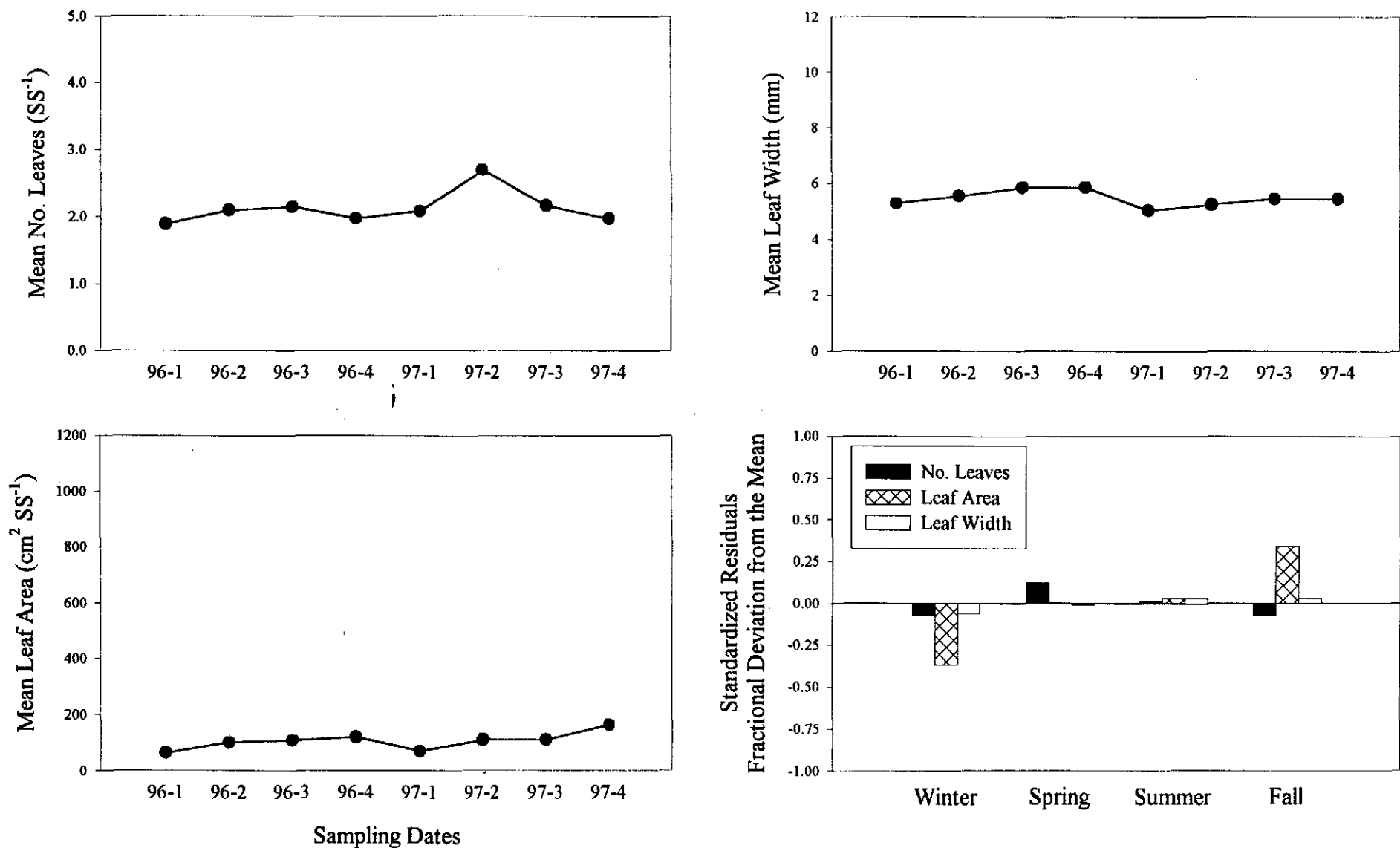
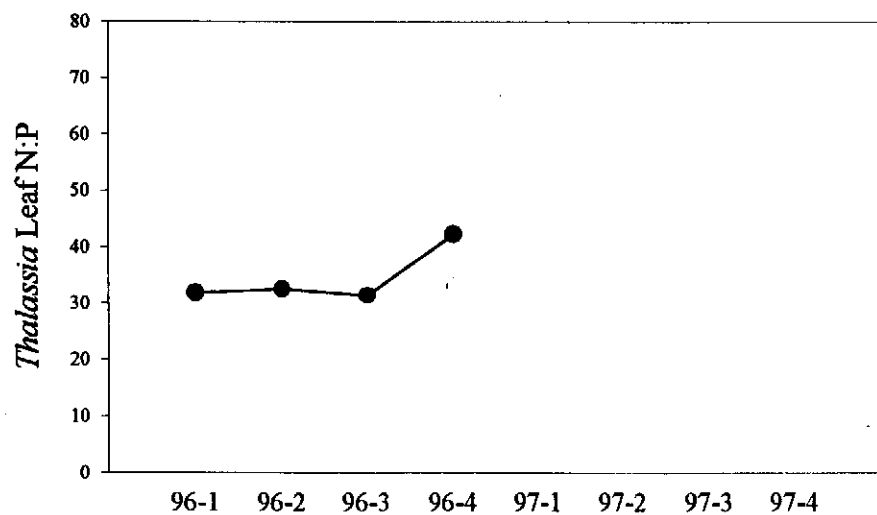
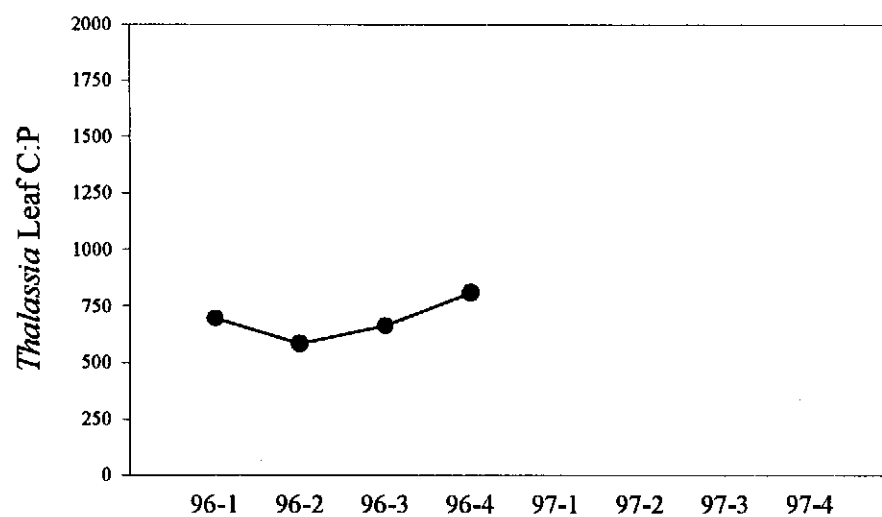
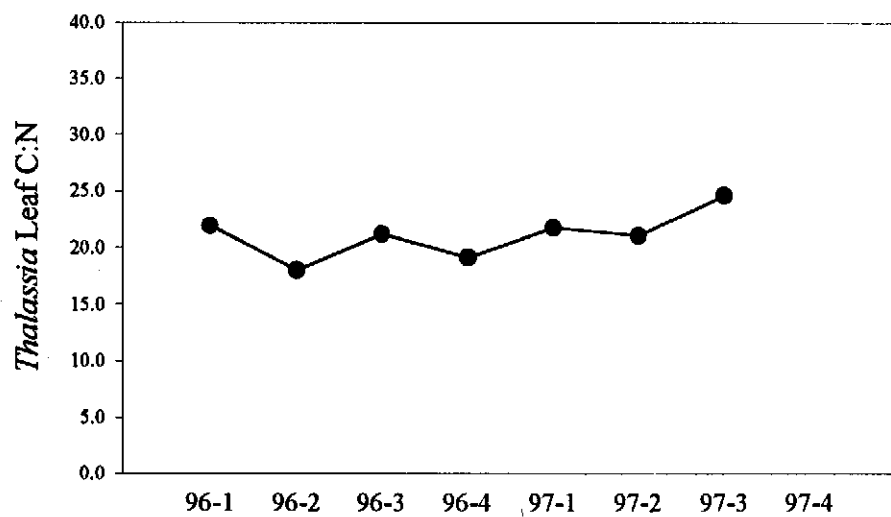


Figure 16d. Site 255. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 16e. Site 255. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

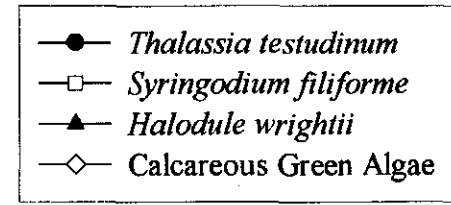
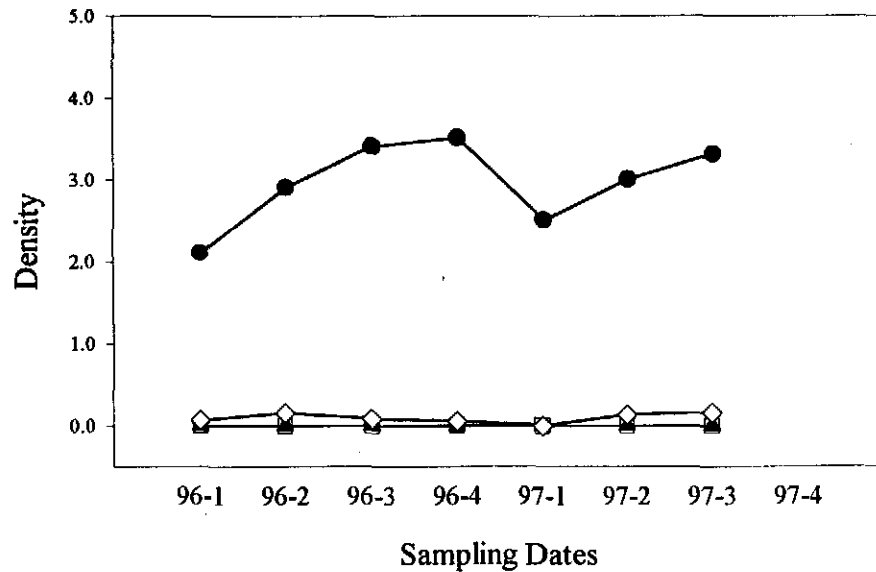
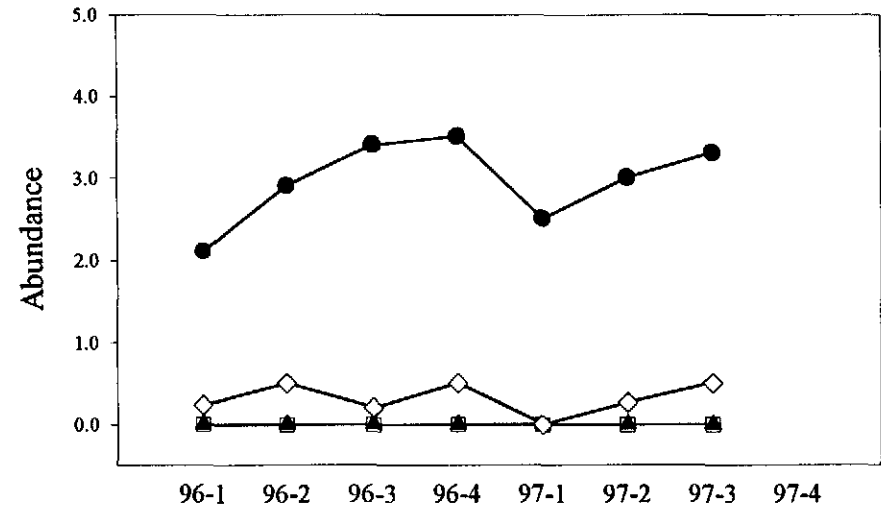
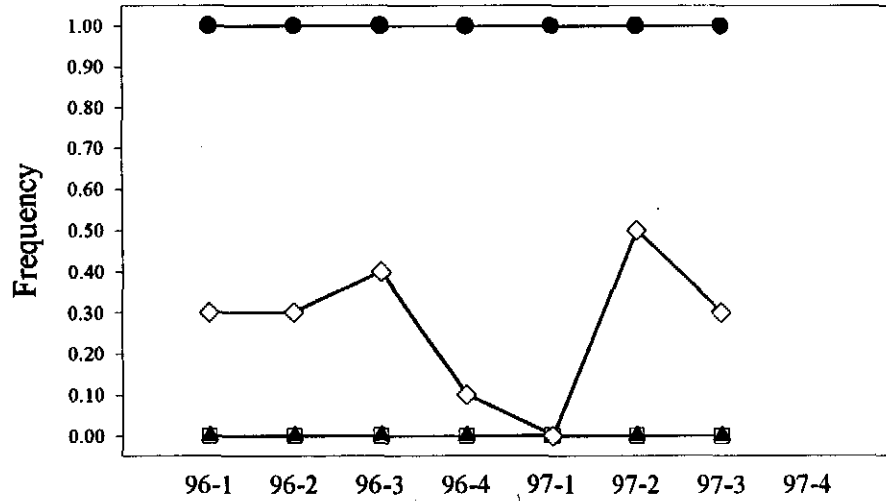
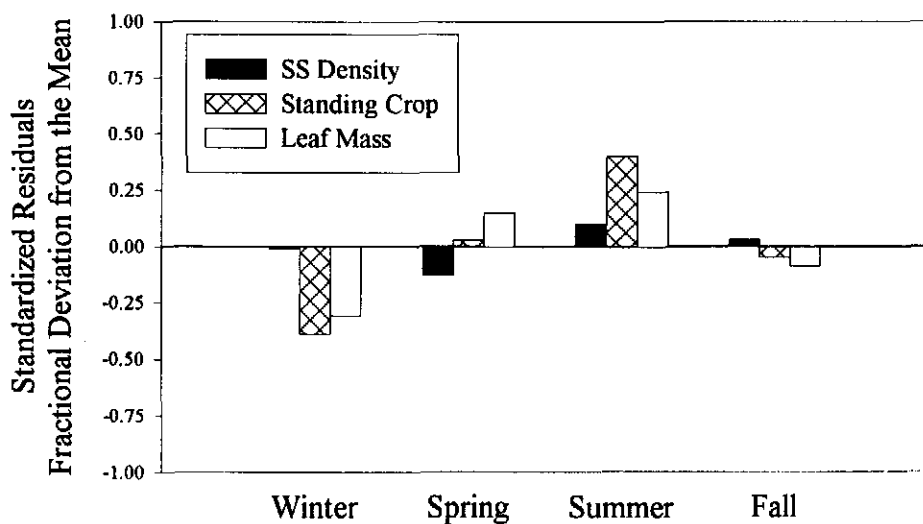
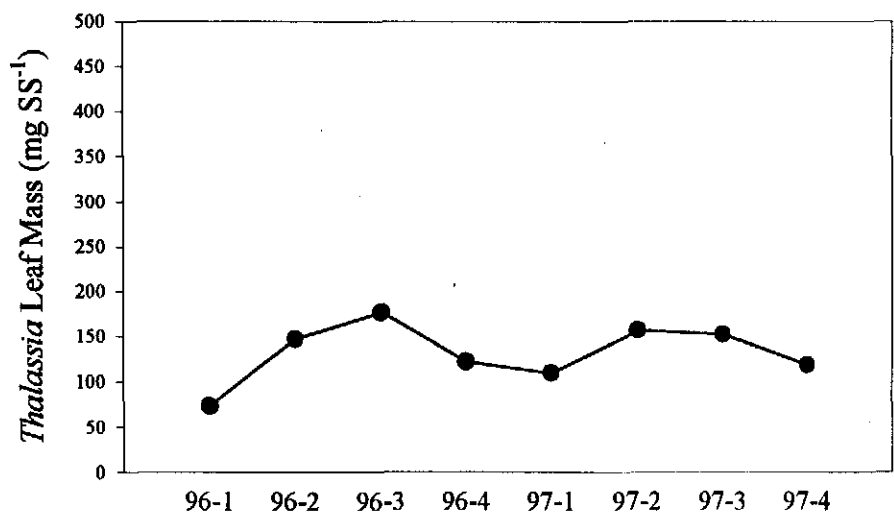
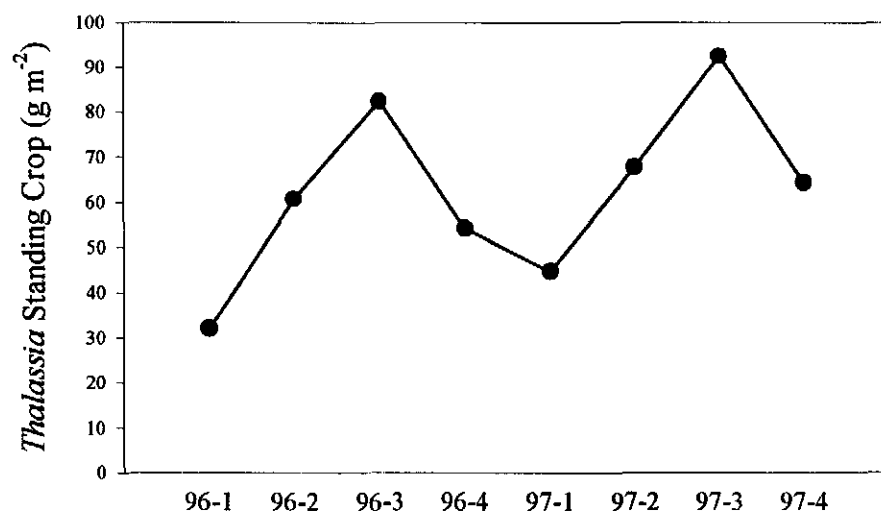
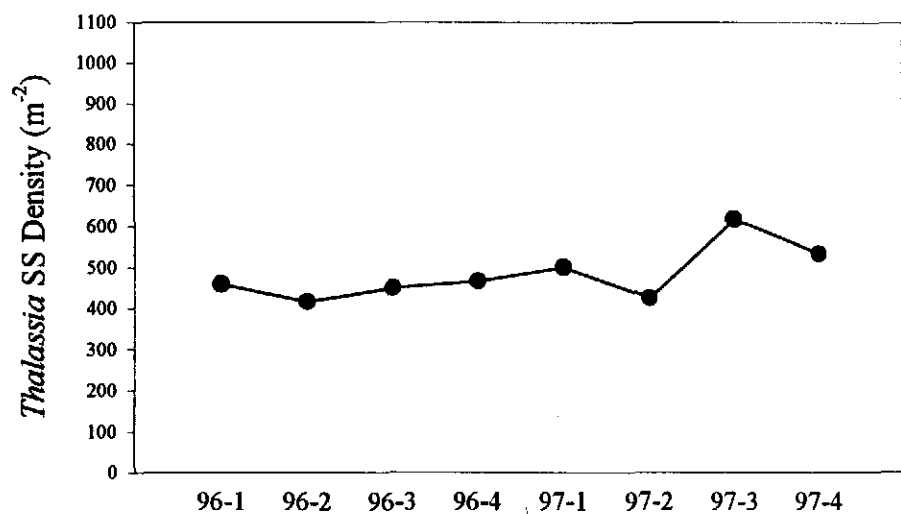
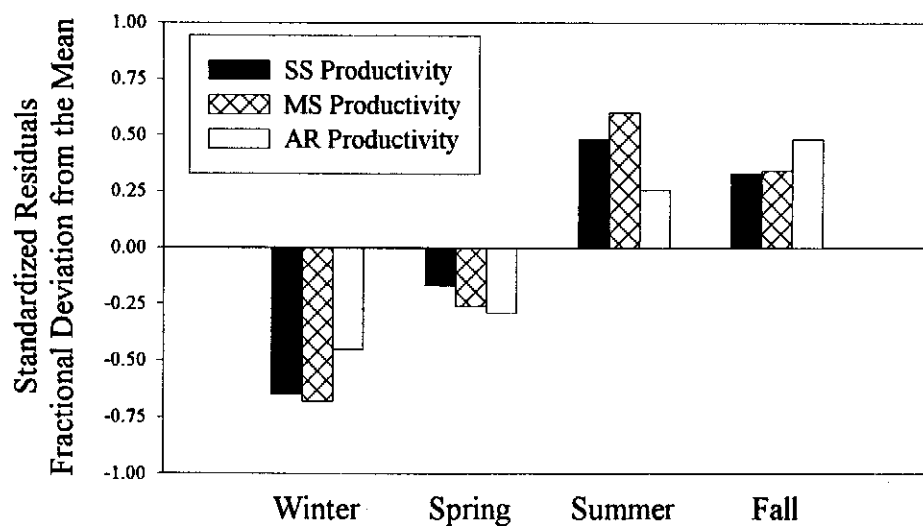
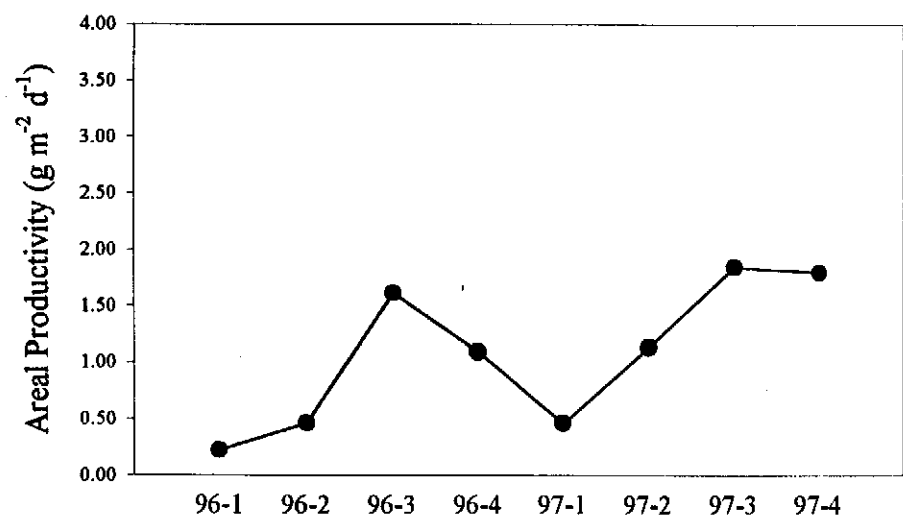
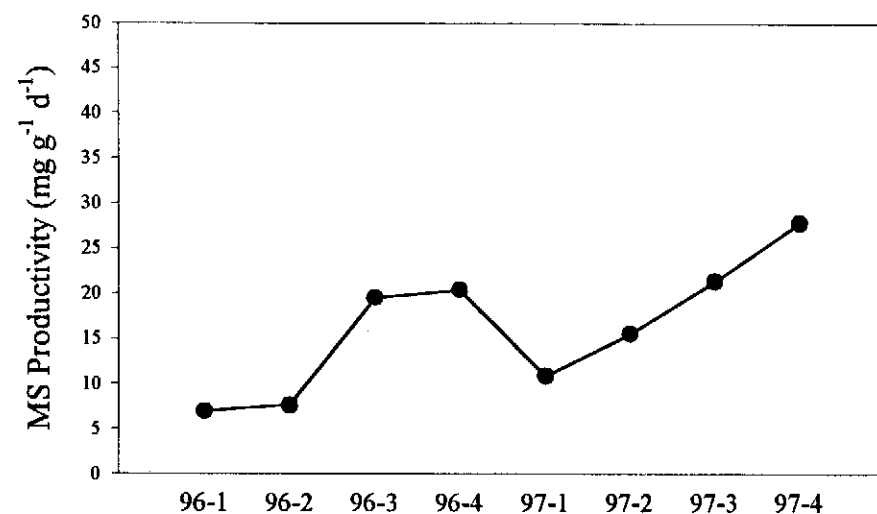
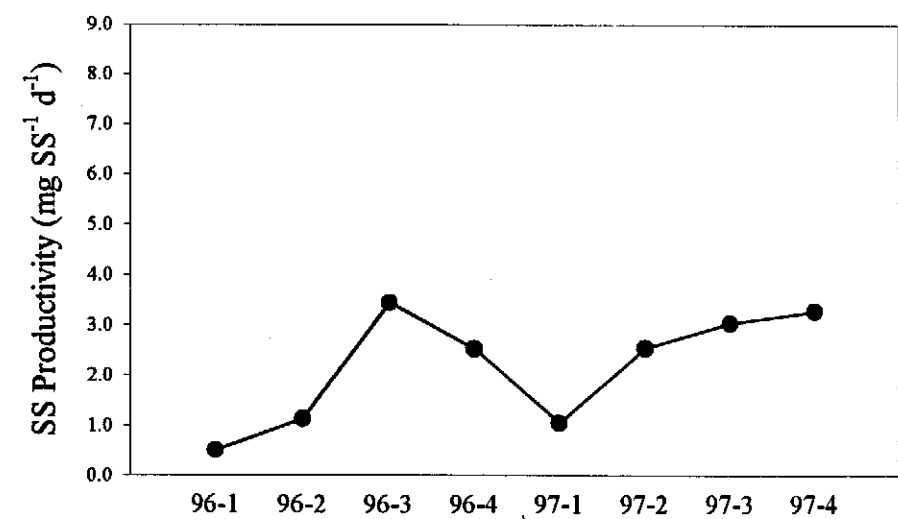


Figure 17a. Site 260. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 17b. Site 260. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 17c. Site 260. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

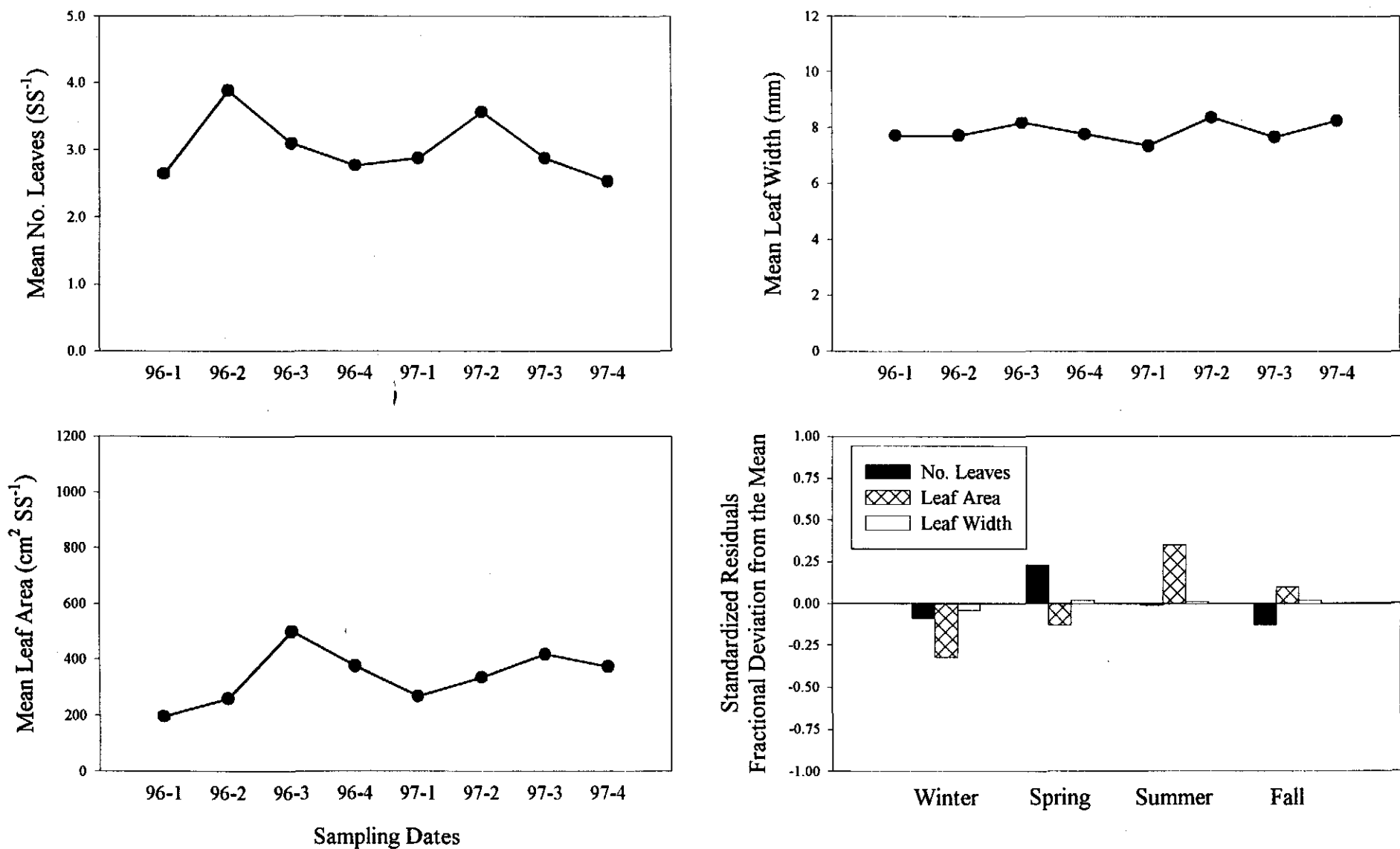


Figure 17d. Site 260. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

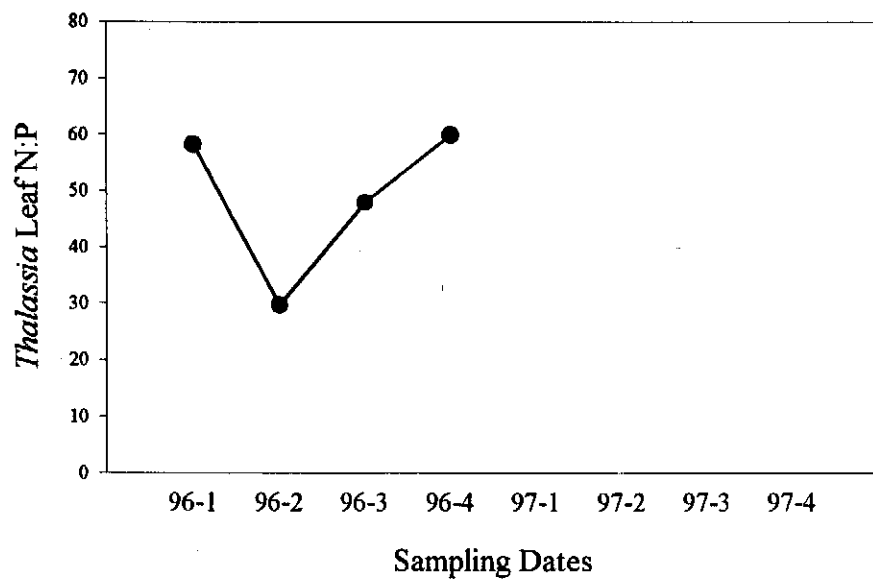
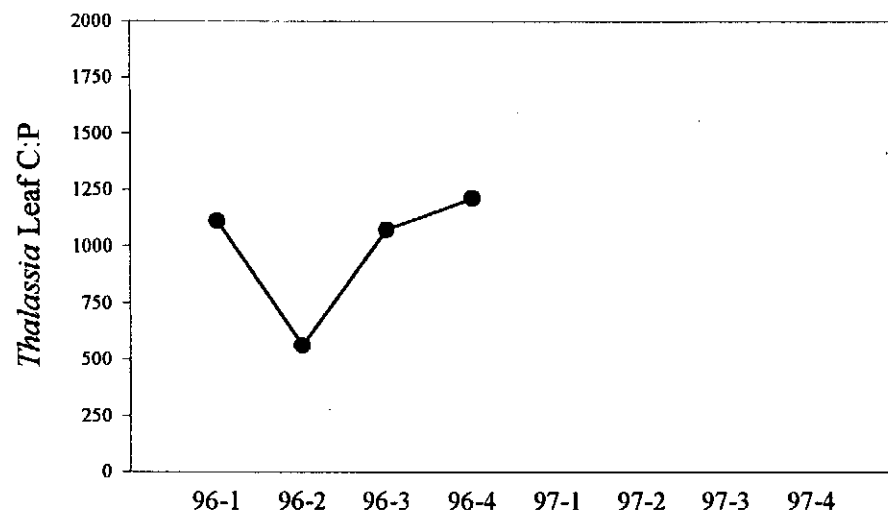
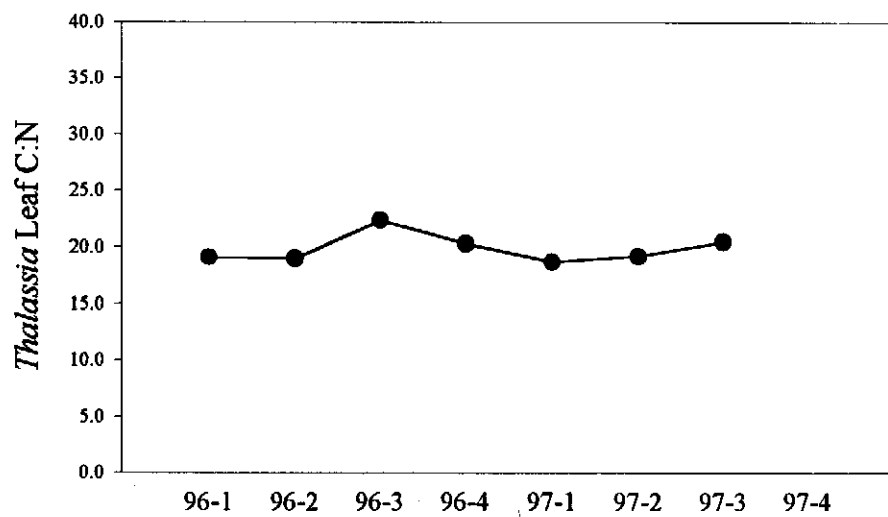


Figure 17e. Site 260. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

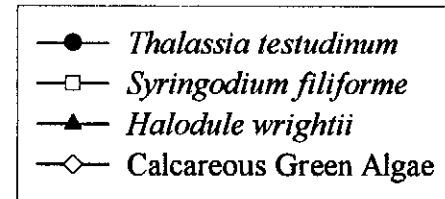
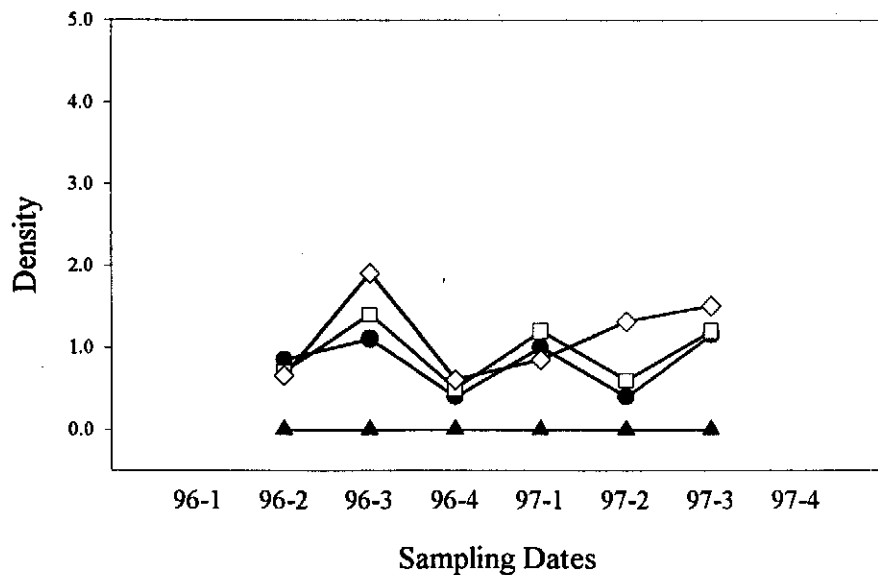
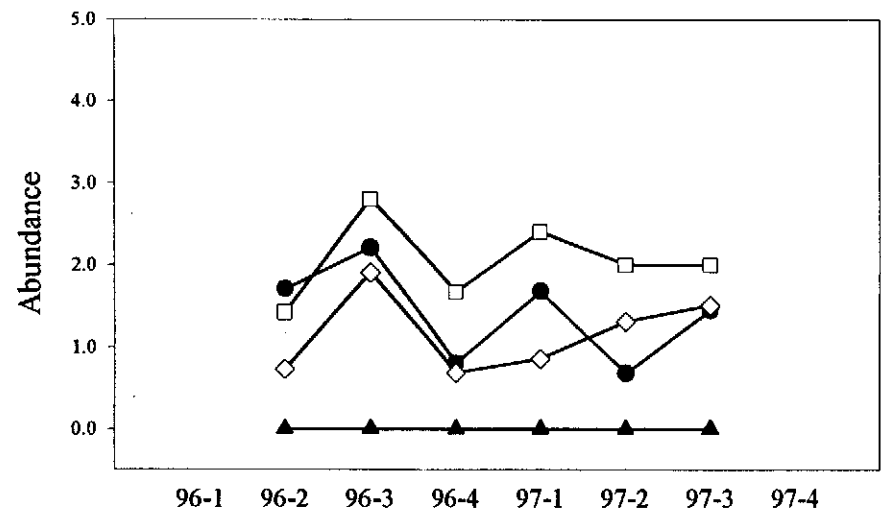
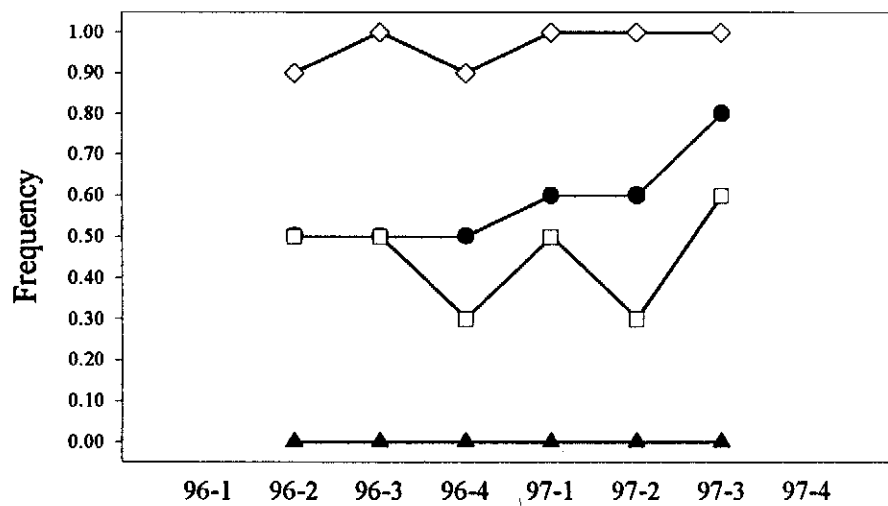
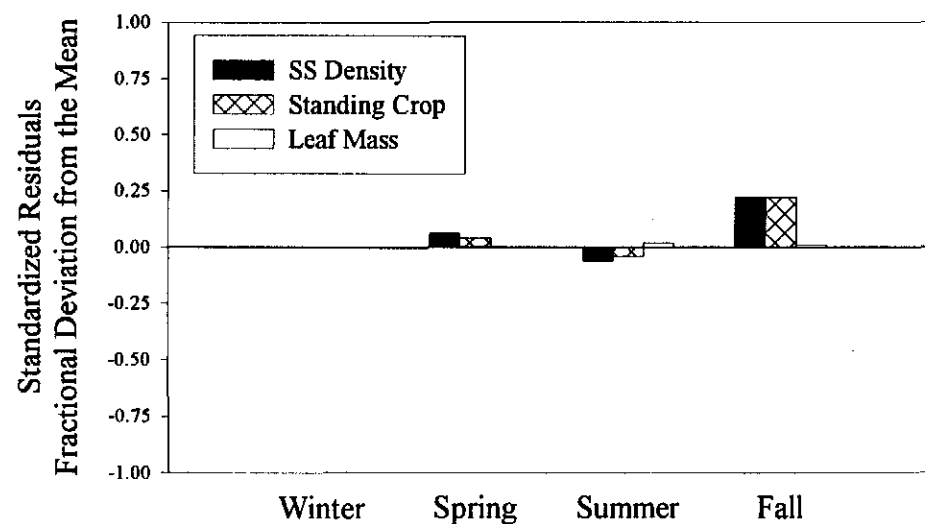
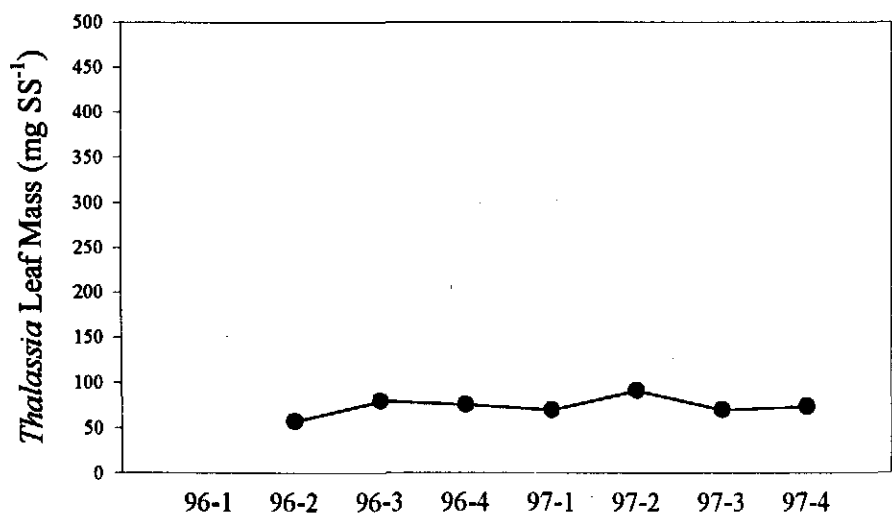
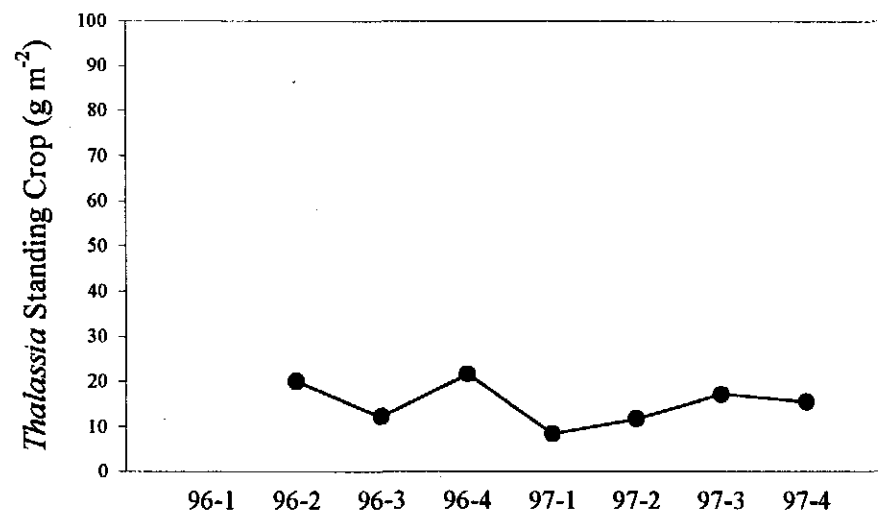
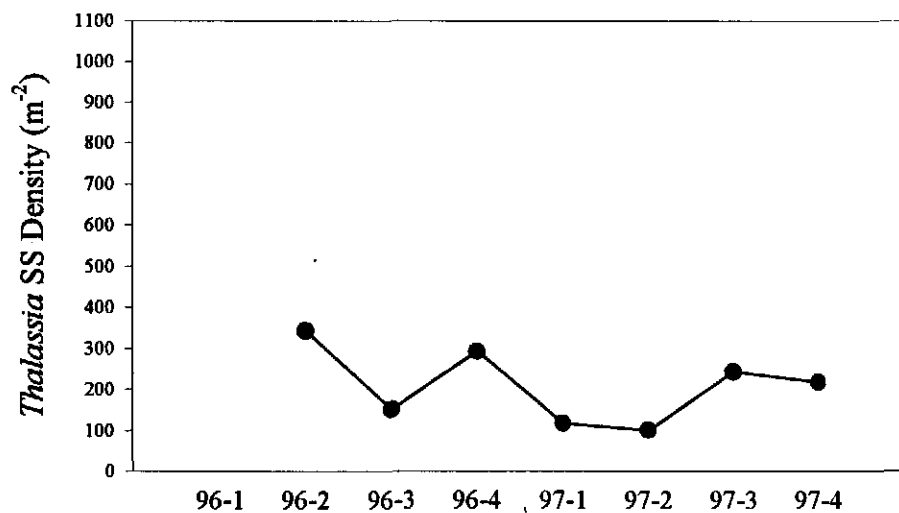
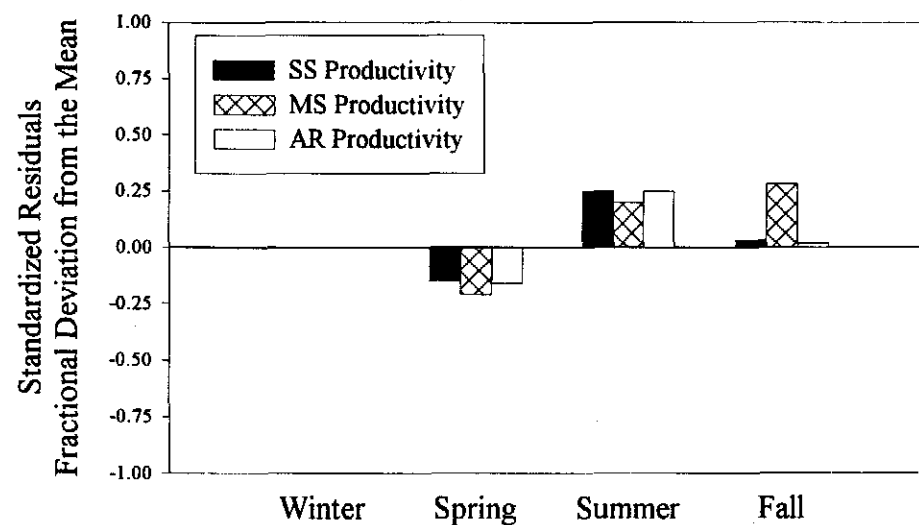
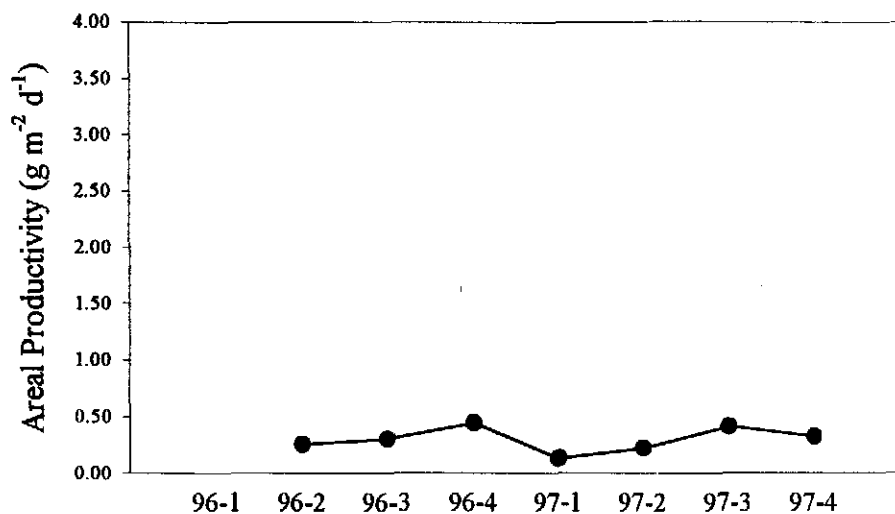
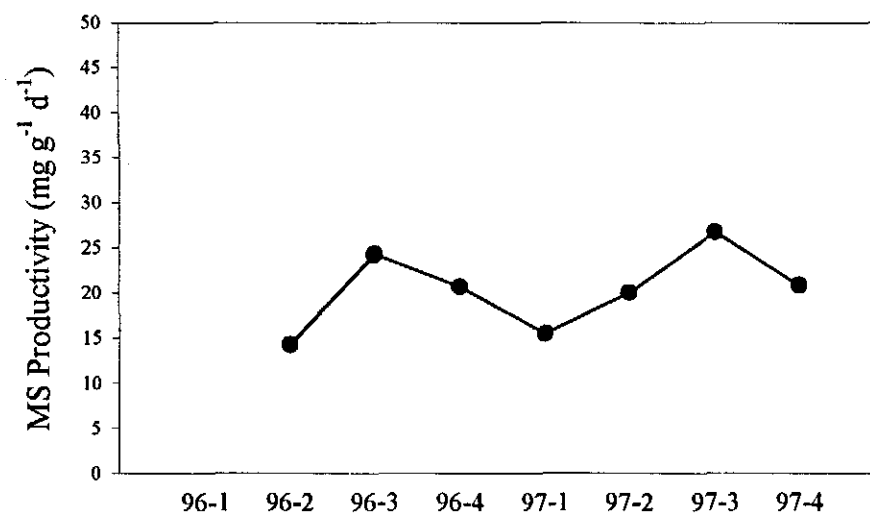
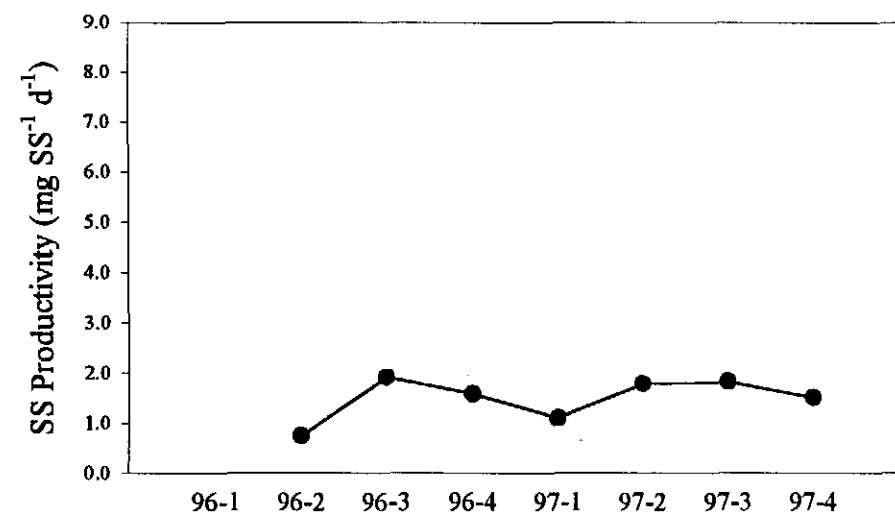


Figure 18a. Site 267. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 18b. Site 267. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 18c. Site 267. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

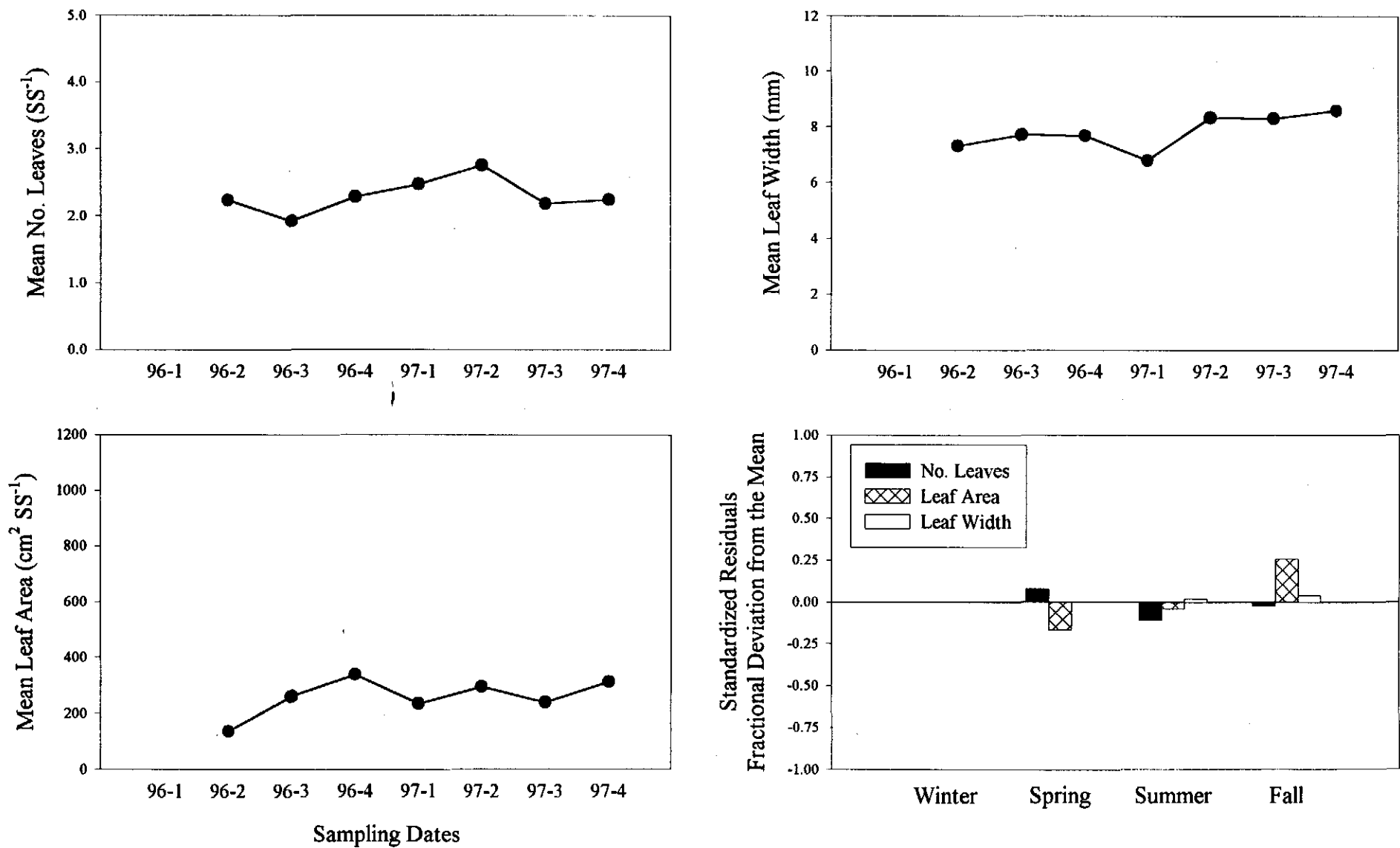
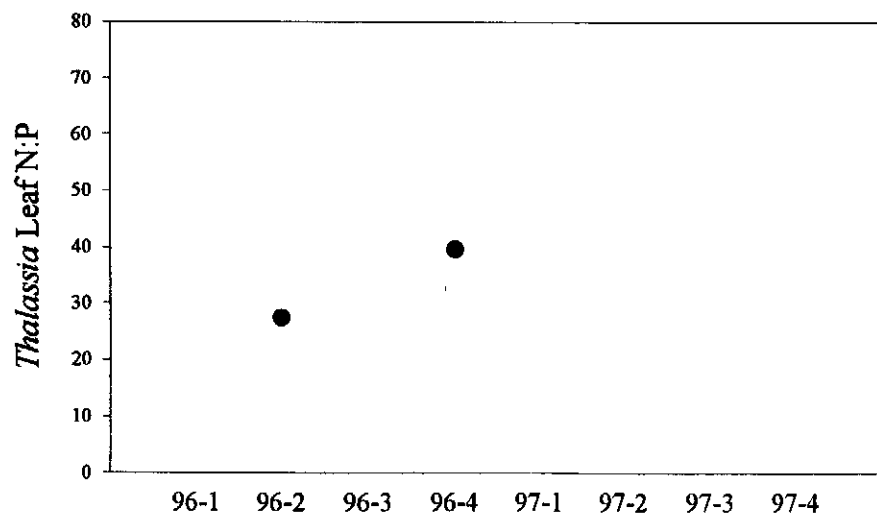
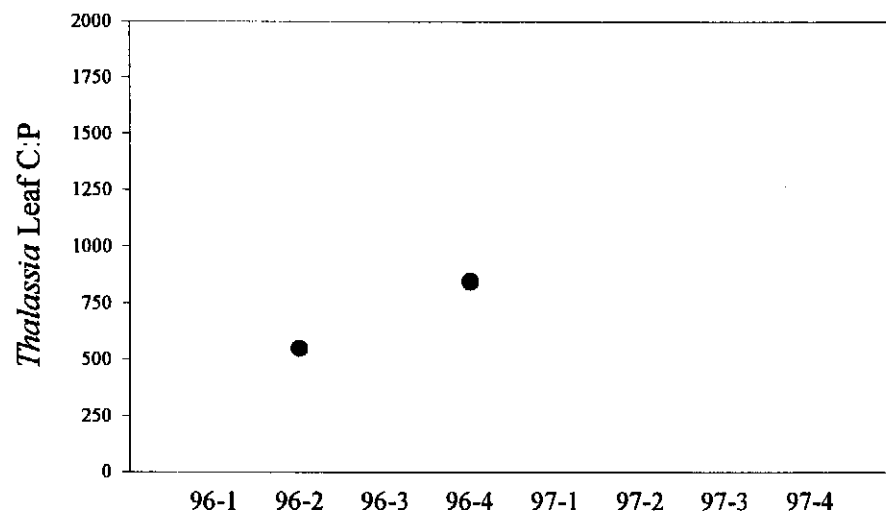
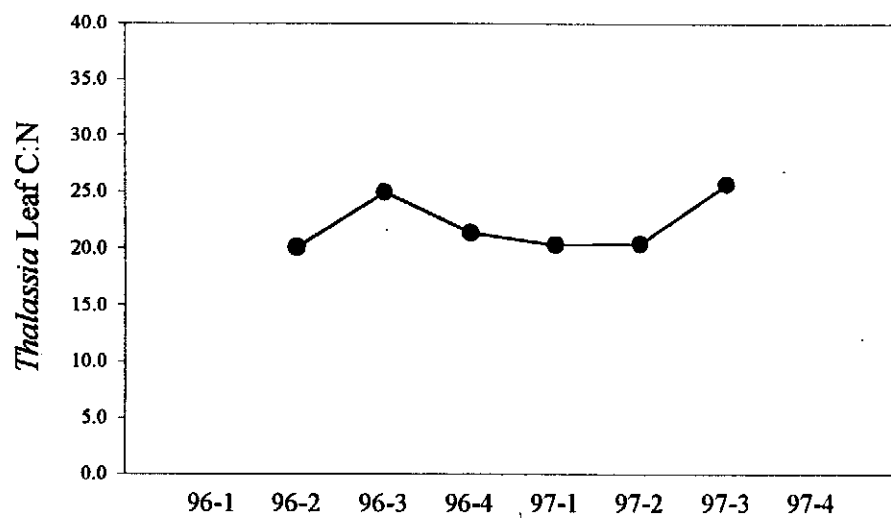


Figure 18d. Site 267. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 18e. Site 267. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

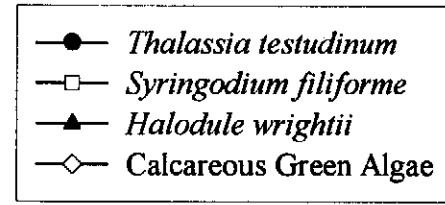
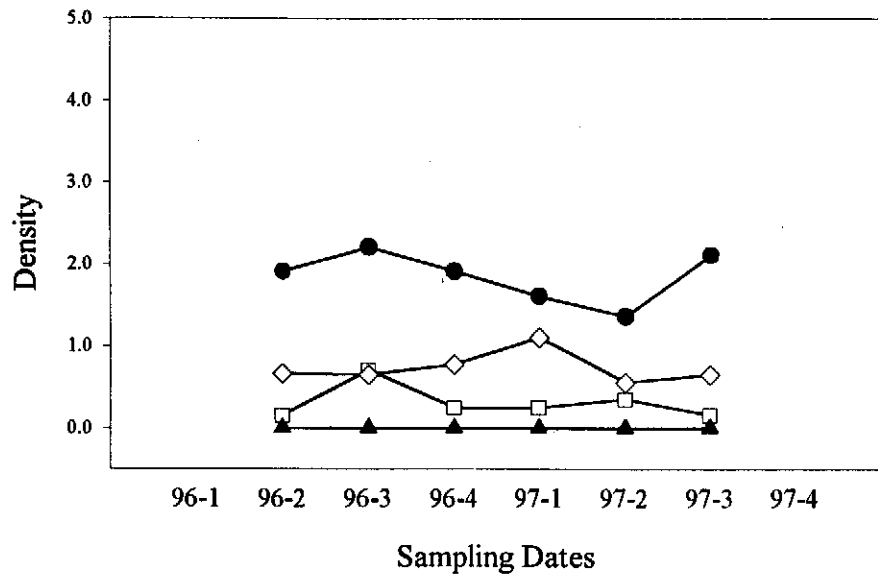
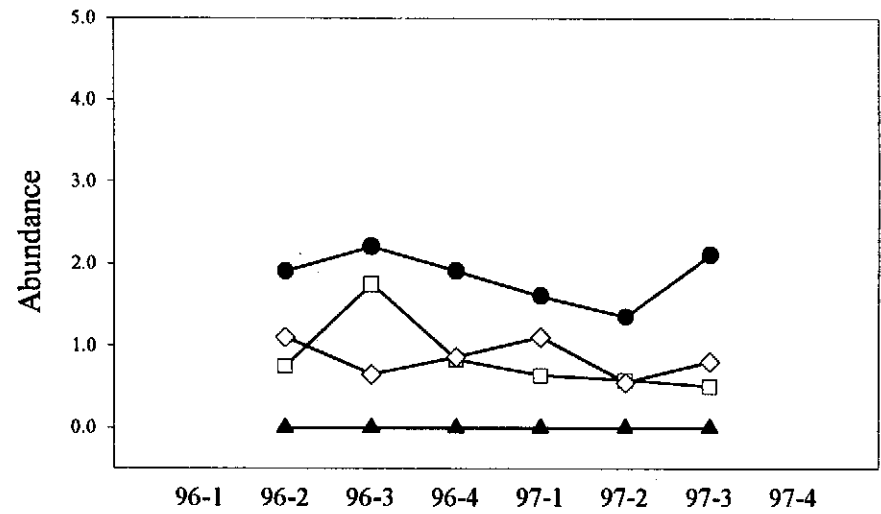
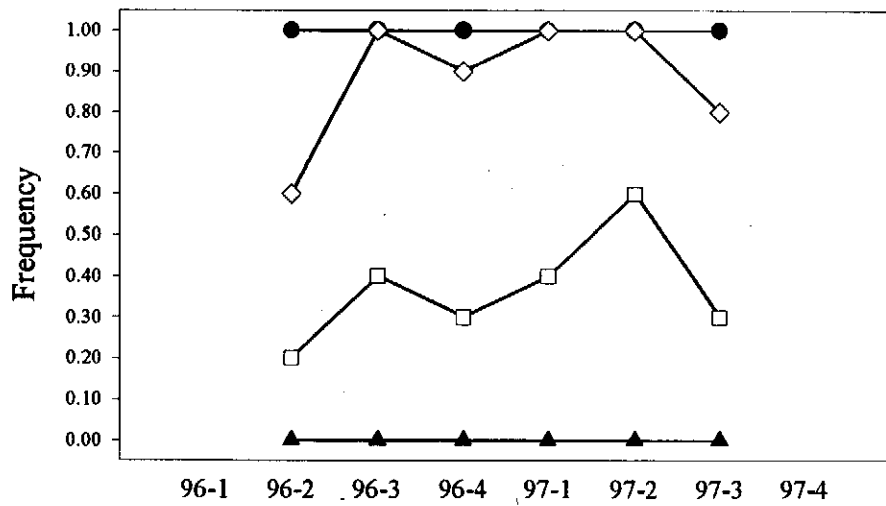
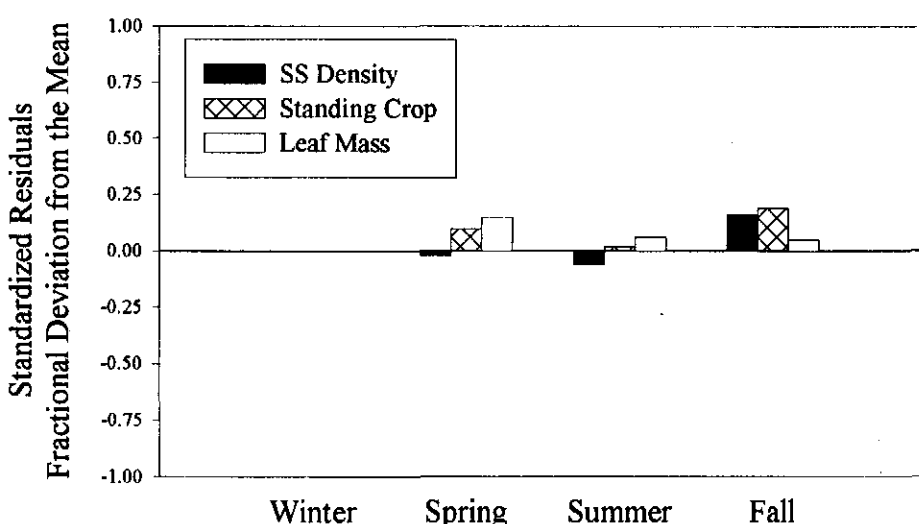
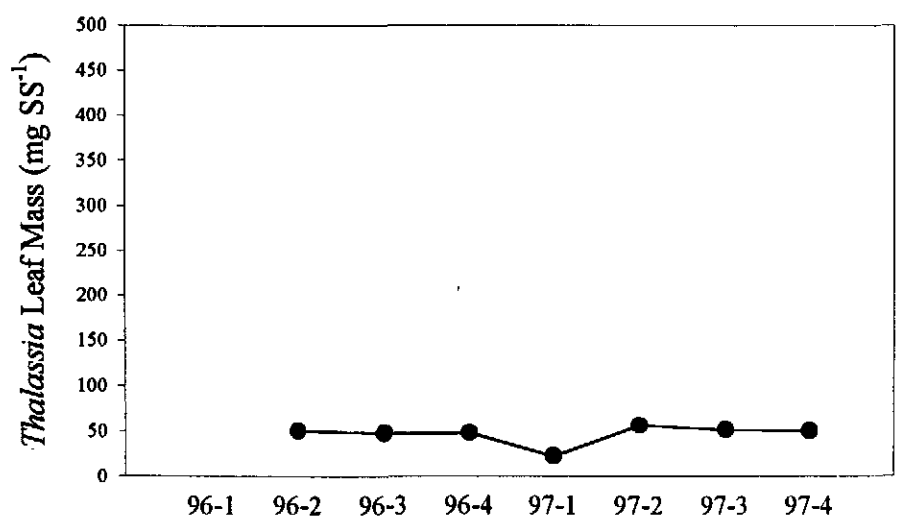
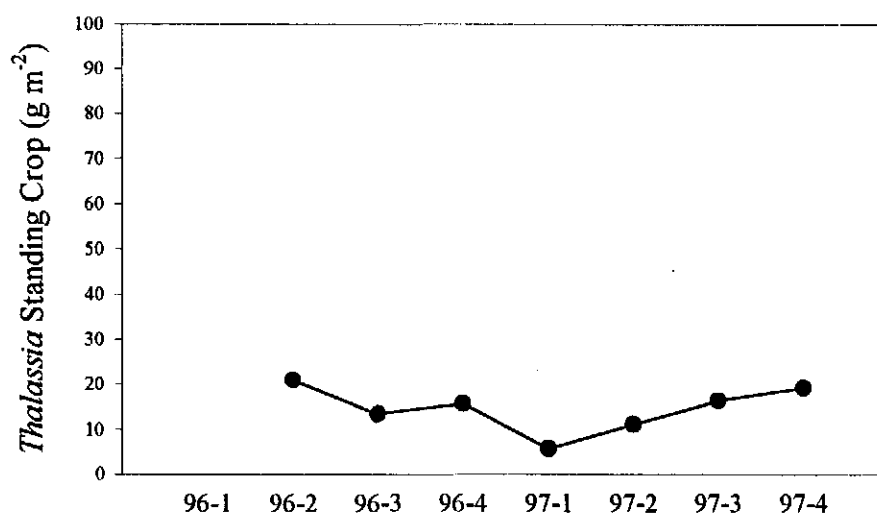
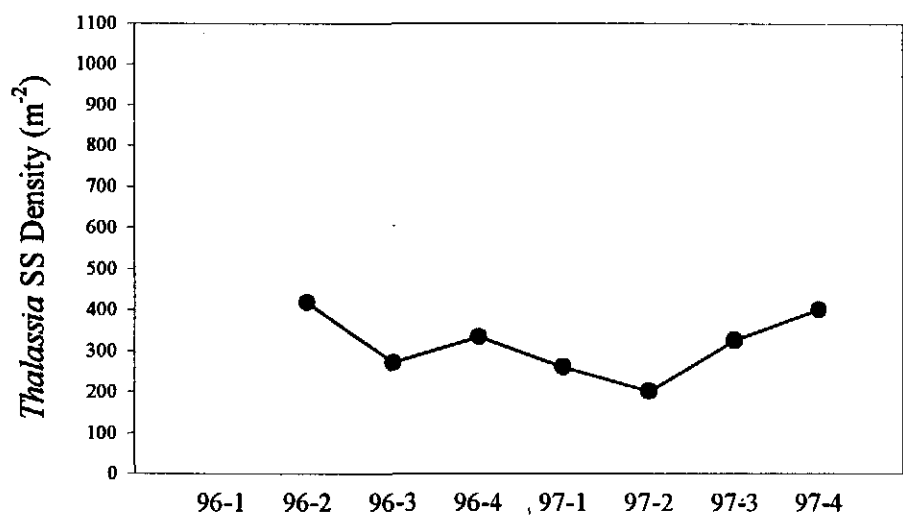
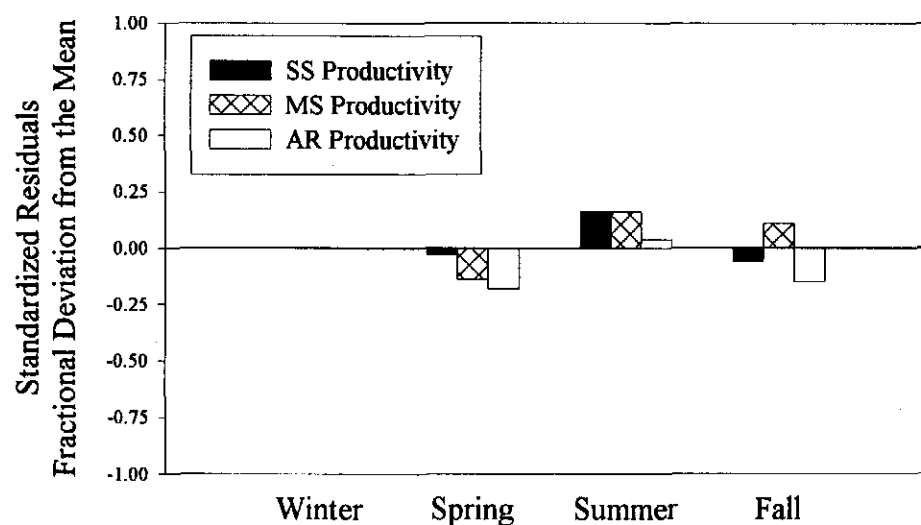
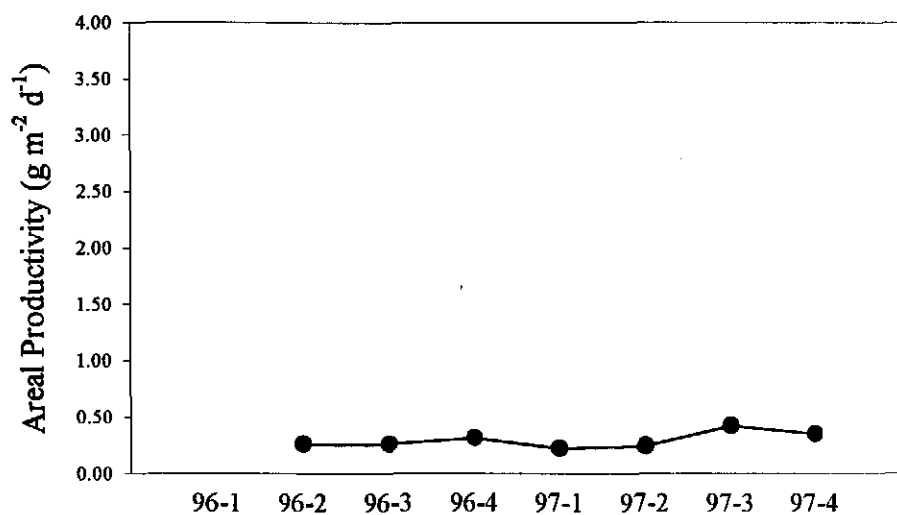
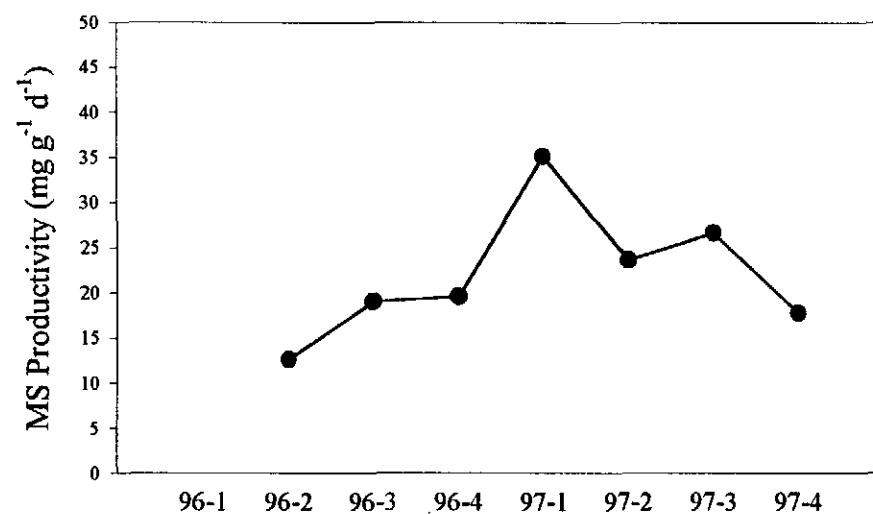
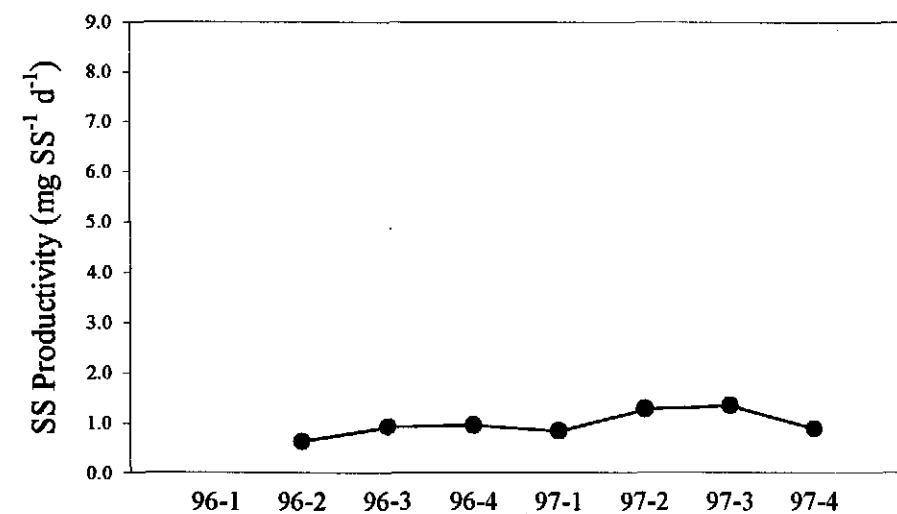


Figure 19a. Site 269. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 19b. Site 269. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 19c. Site 269. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

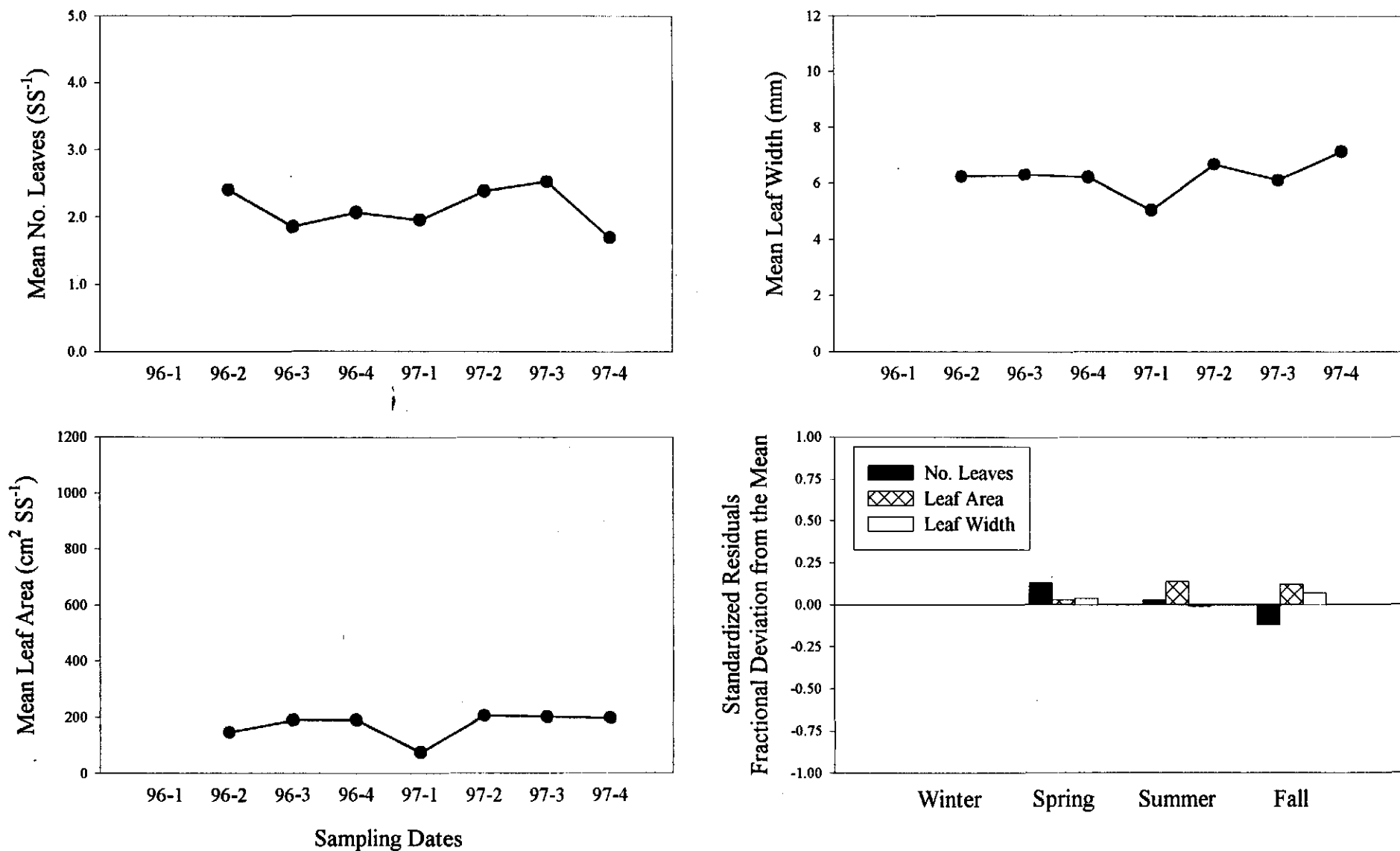


Figure 19d. Site 269. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

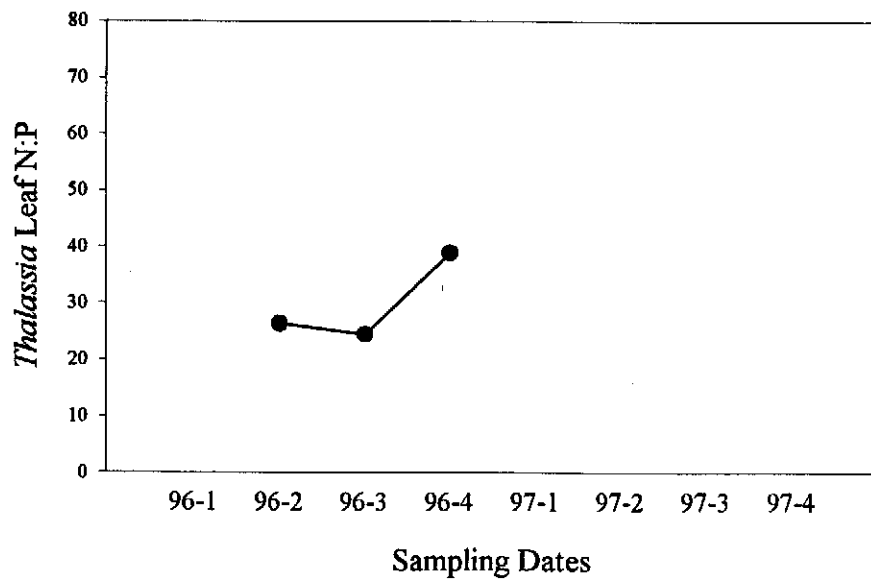
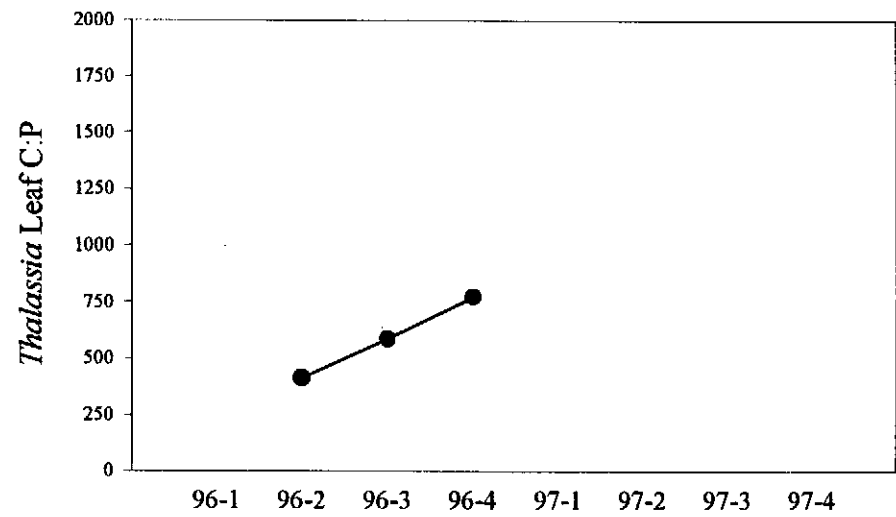
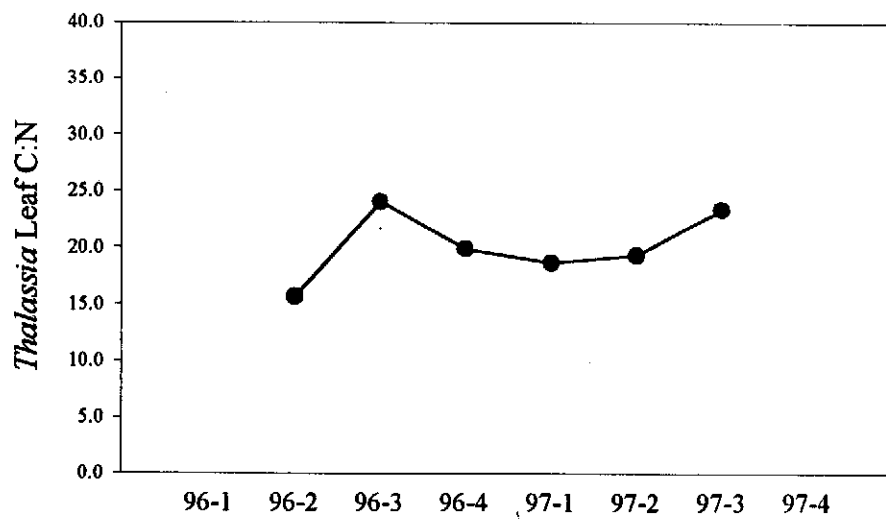
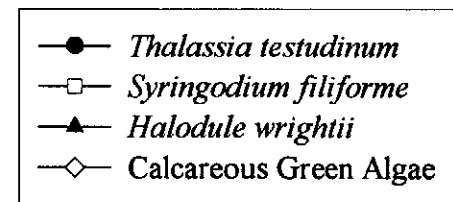
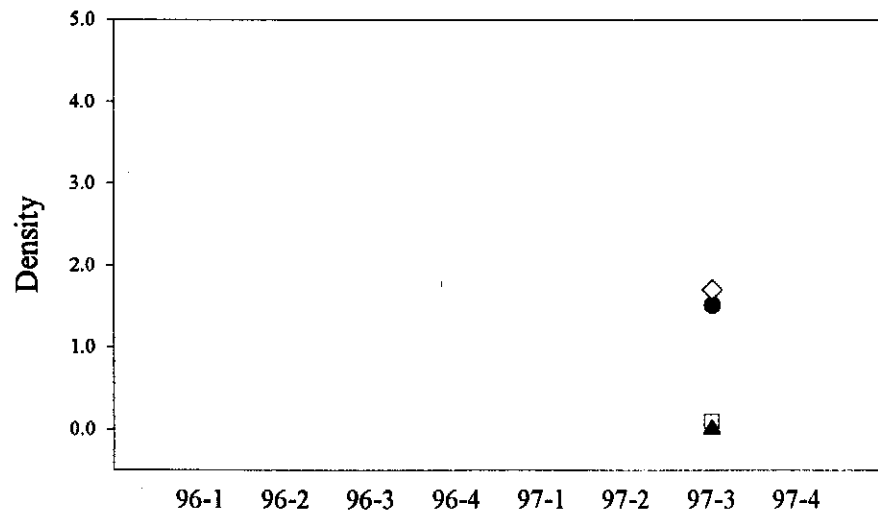
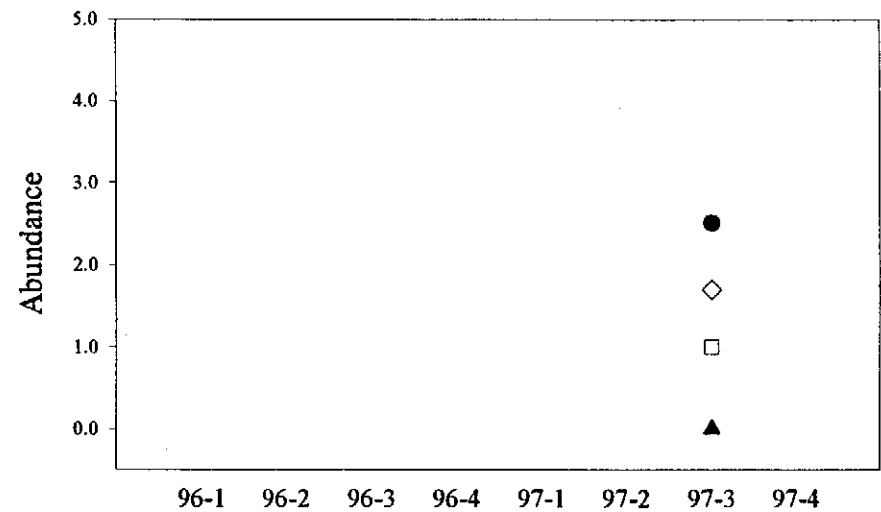
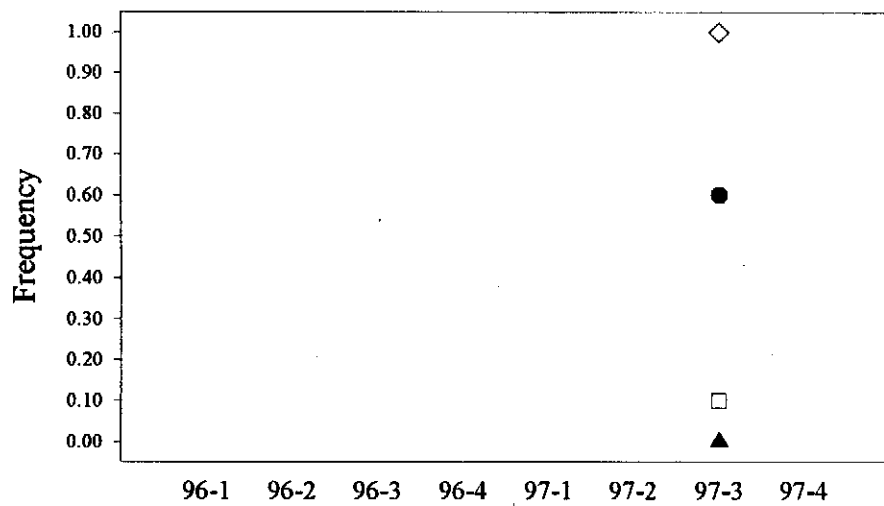


Figure 19e. Site 269. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



Sampling Dates

Figure 20a. Site 271. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.

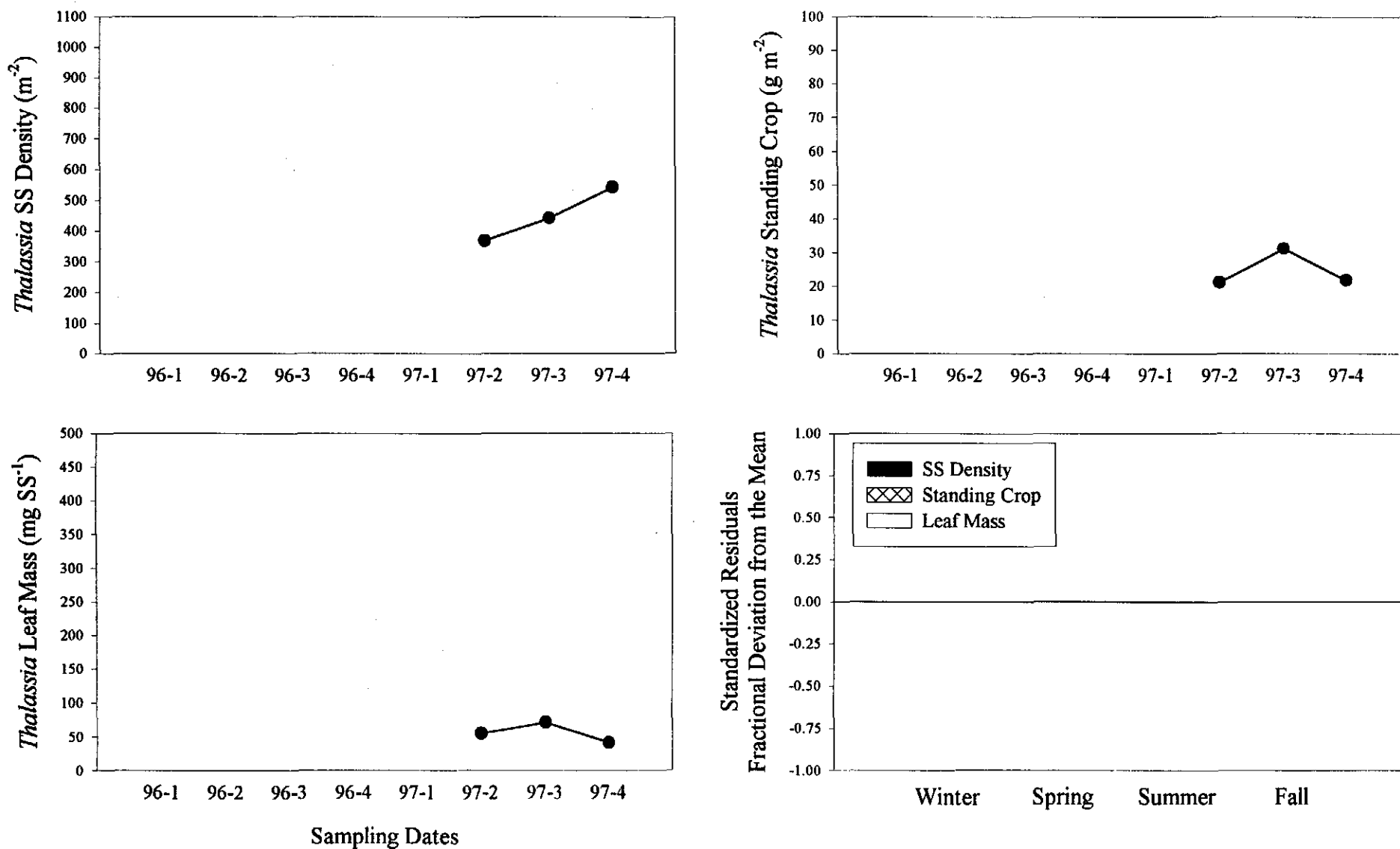


Figure 20b. Site 271. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

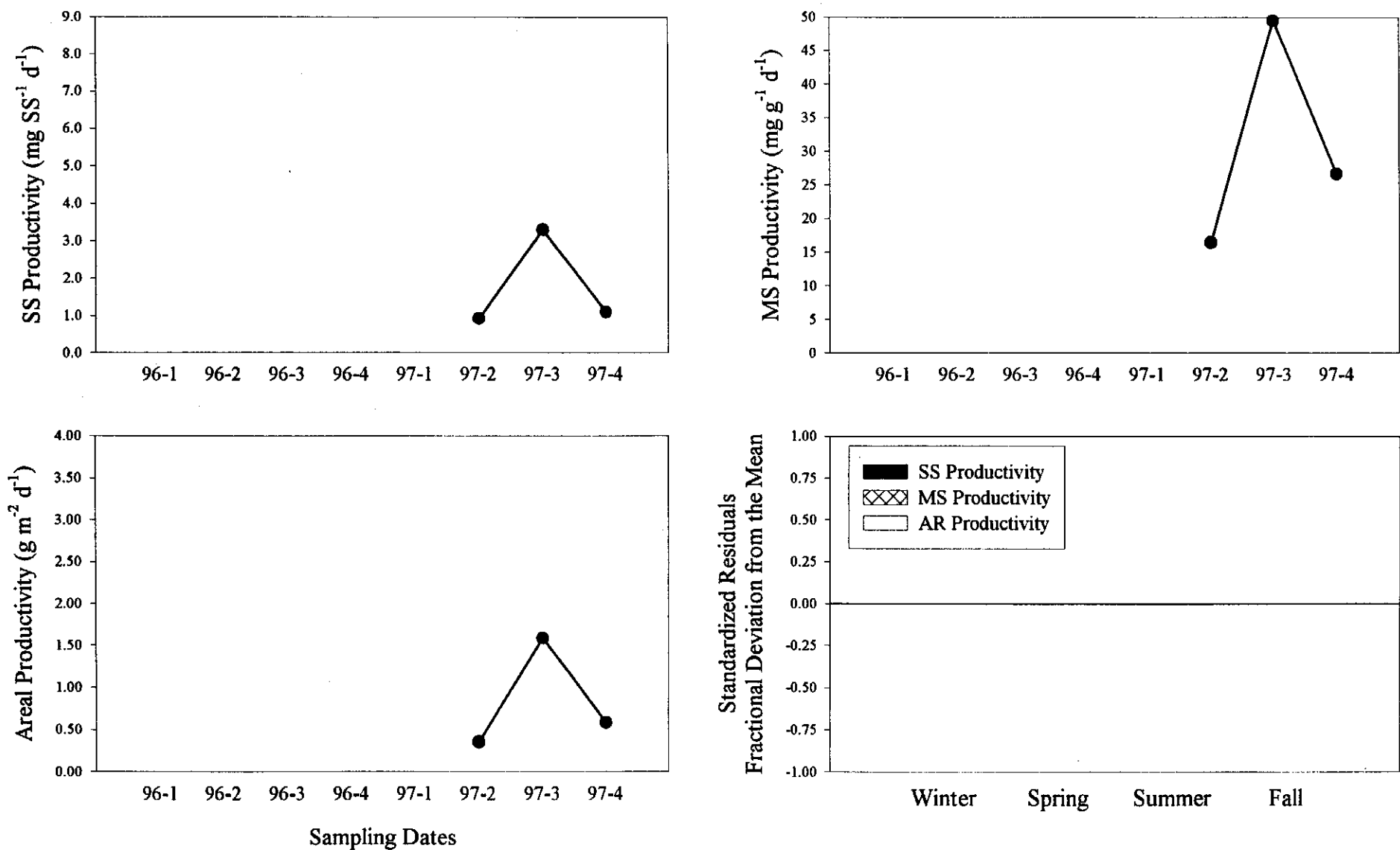


Figure 20c. Site 271. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

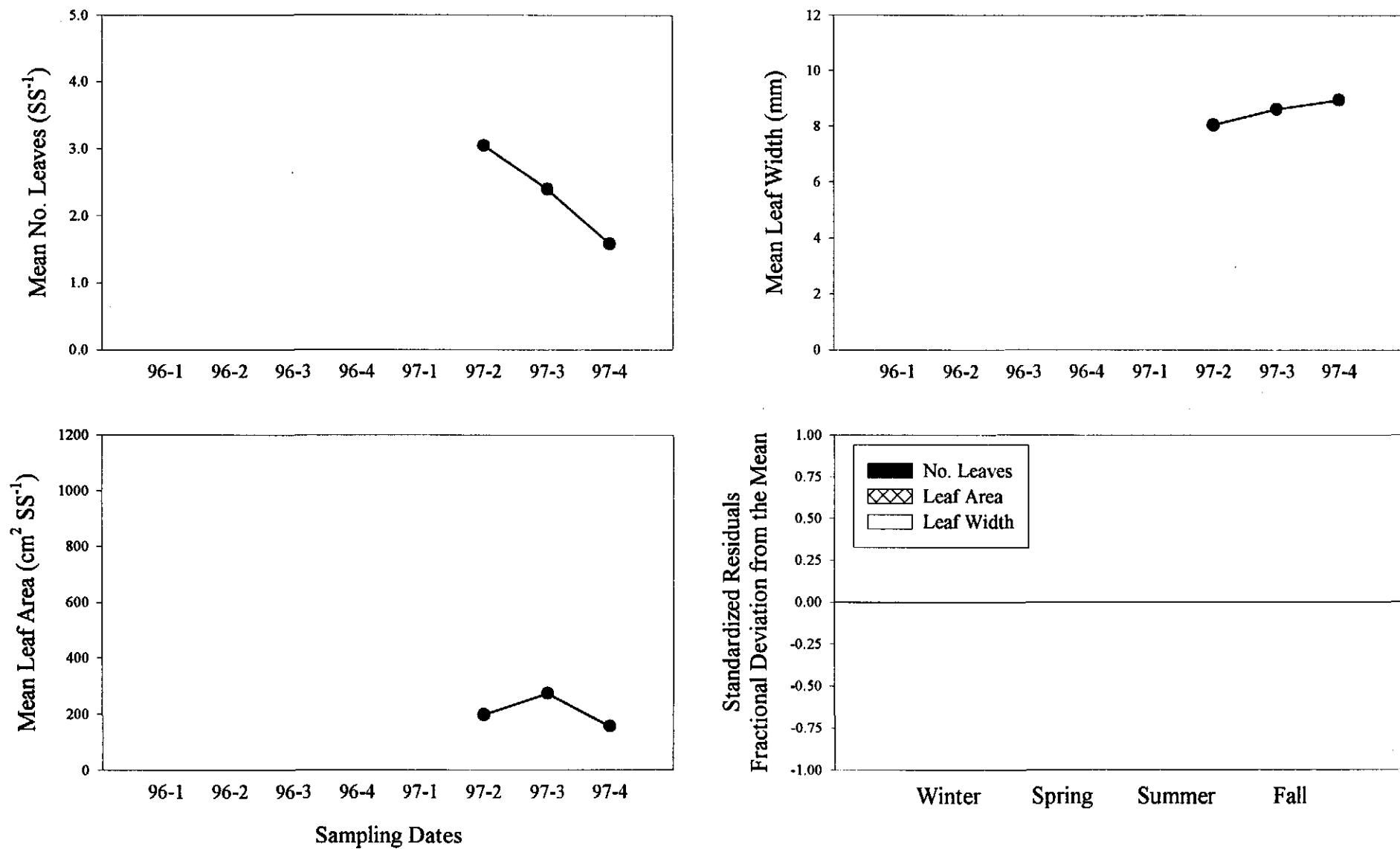
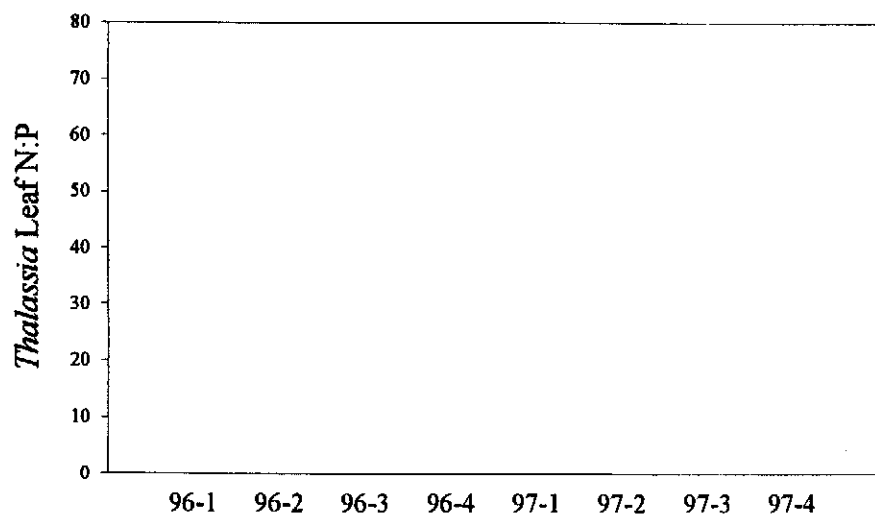
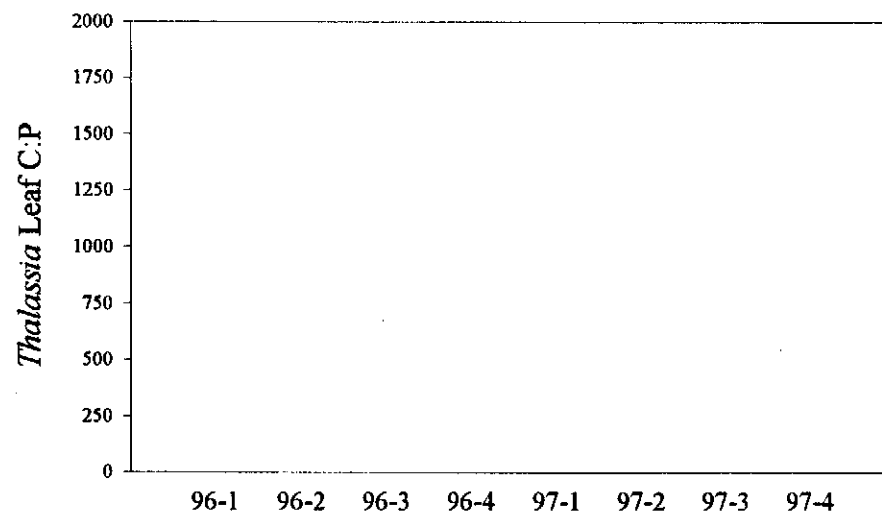
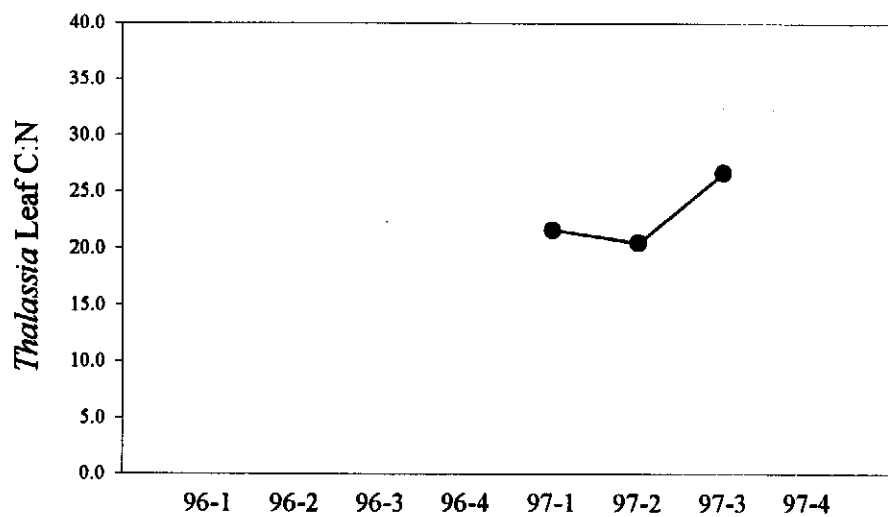
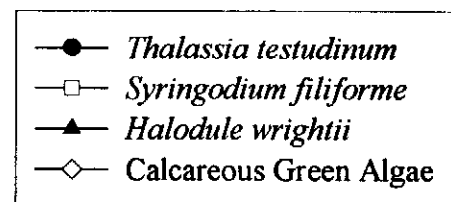
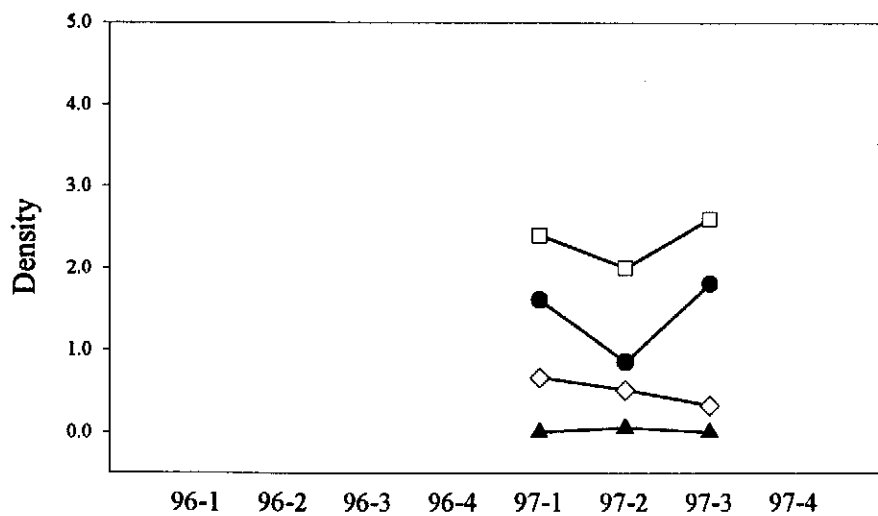
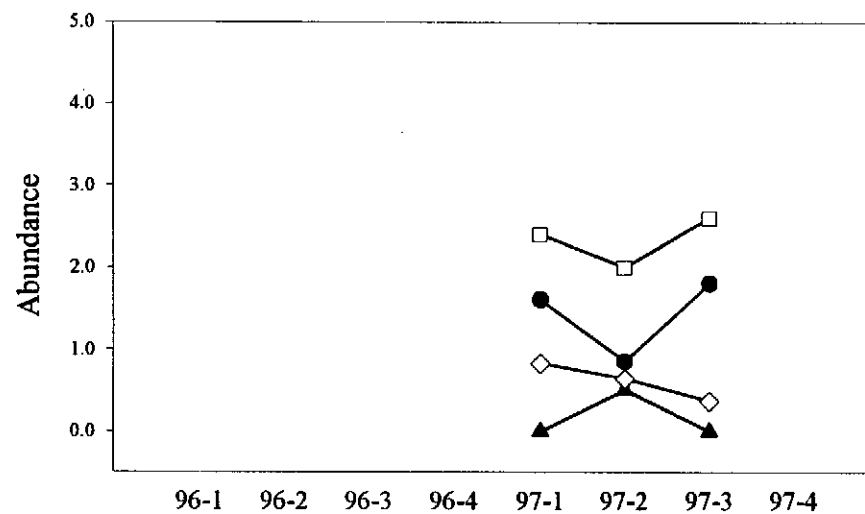
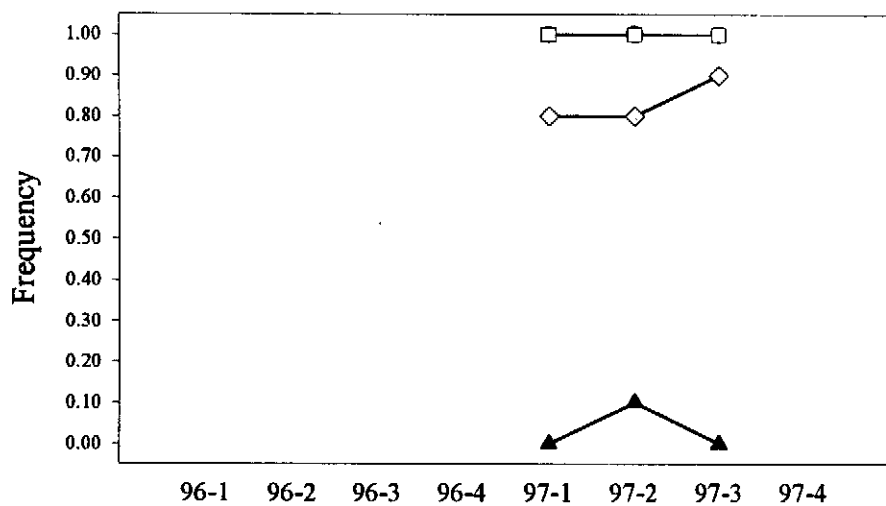


Figure 20d. Site 271. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



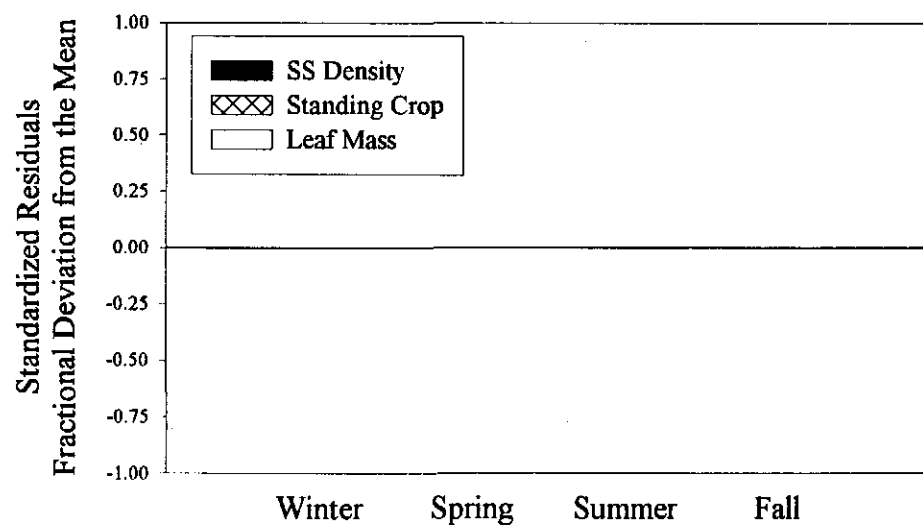
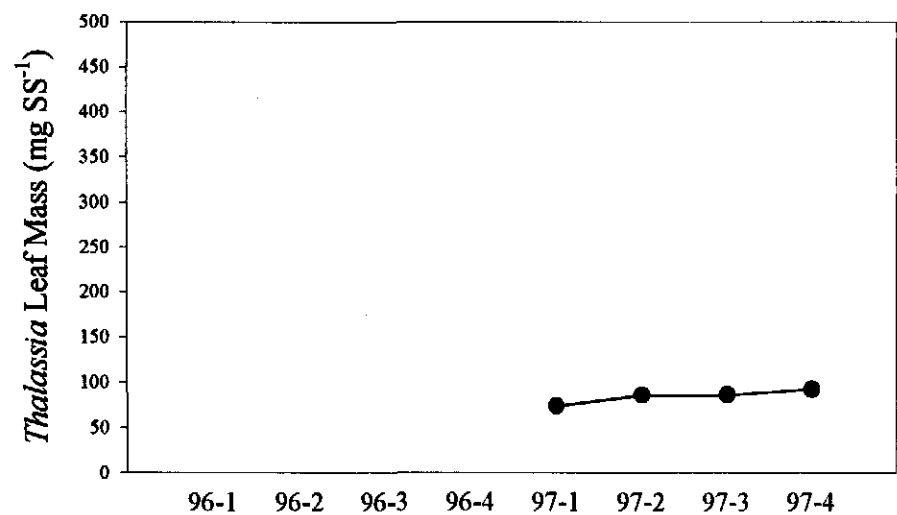
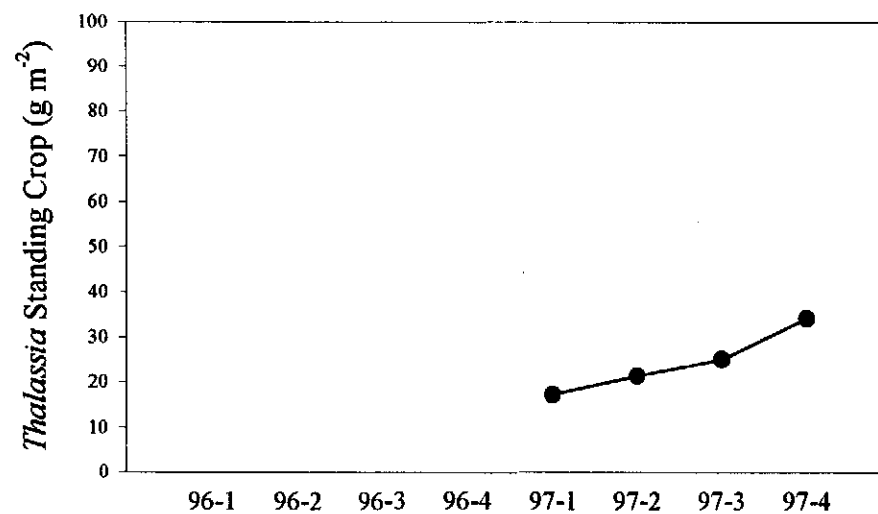
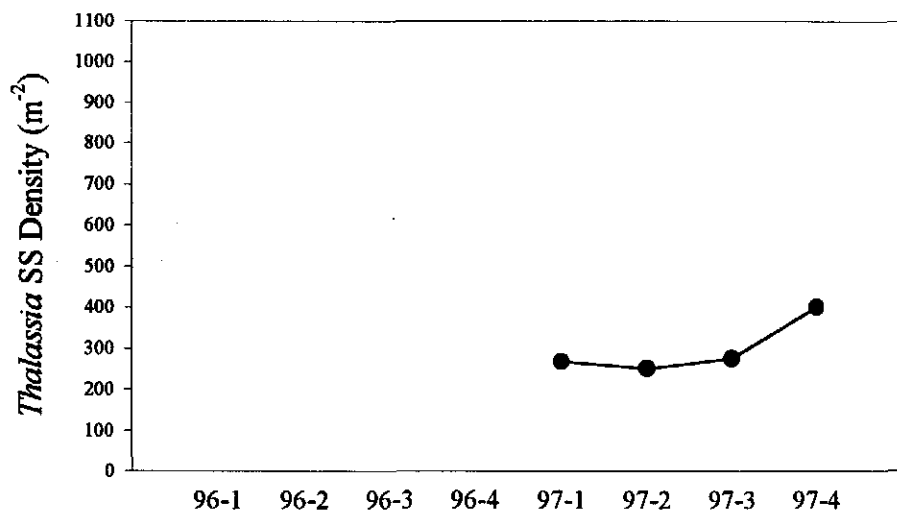
Sampling Dates

Figure 20e. Site 271. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



Sampling Dates

Figure 21a. Site 276. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 21b. Site 276. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

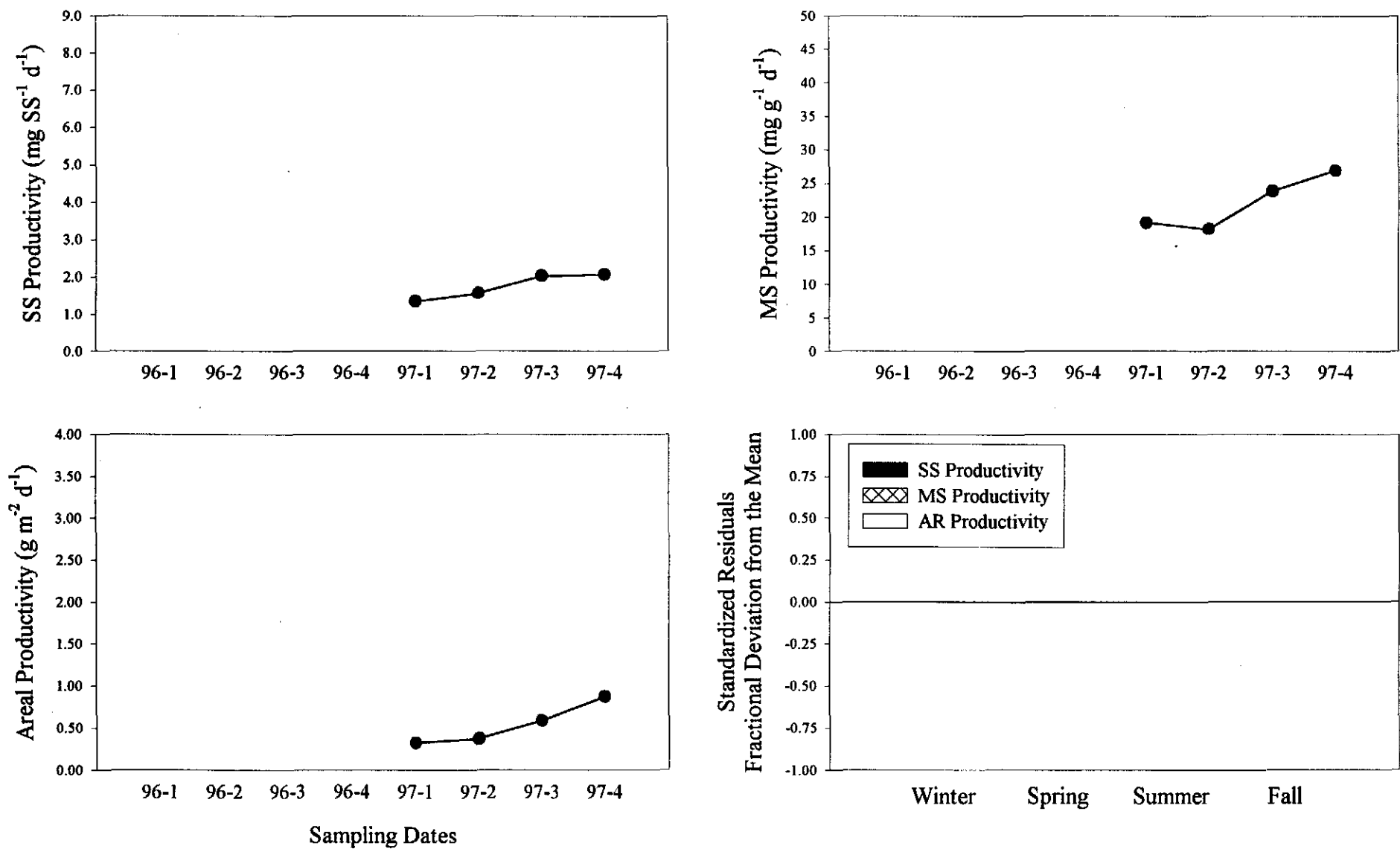


Figure 21c. Site 276. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

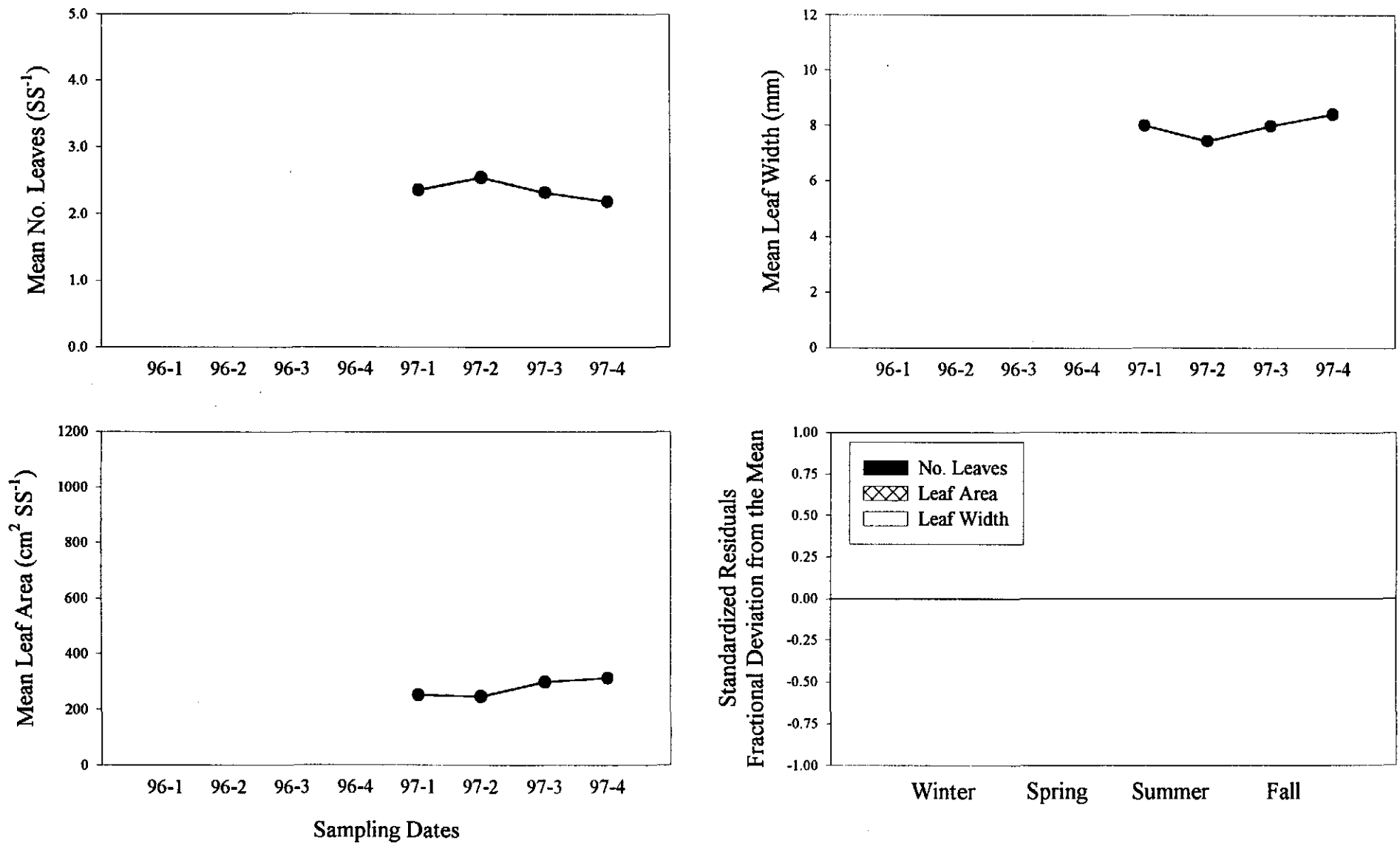
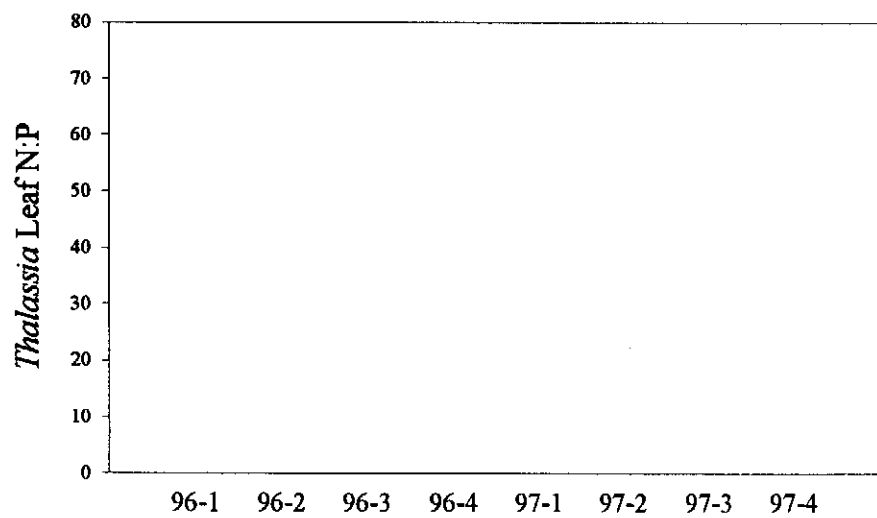
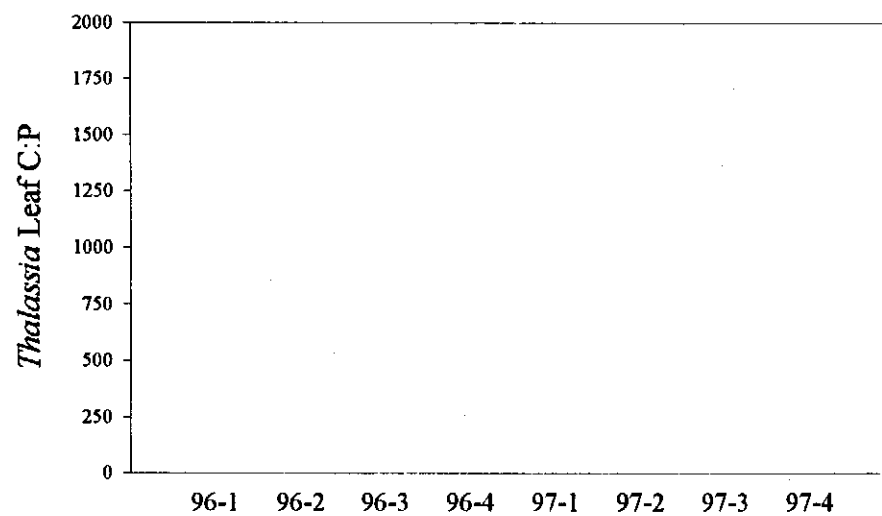
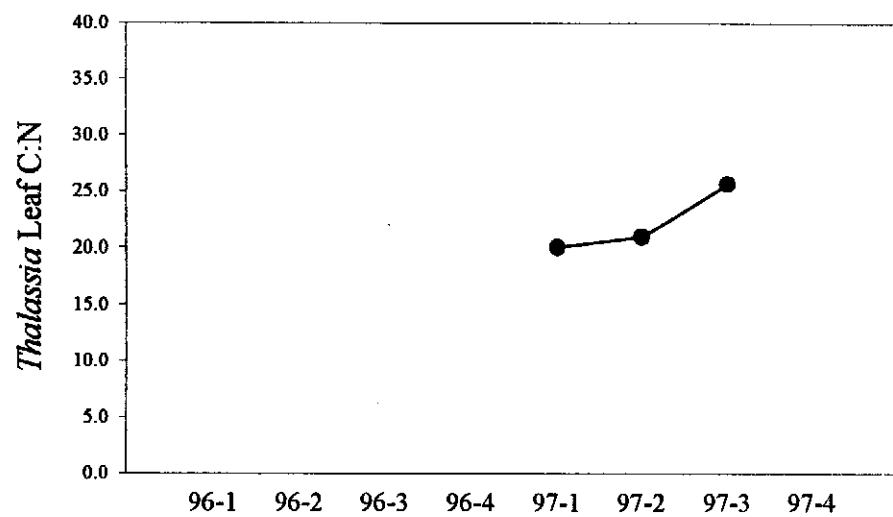


Figure 21d. Site 276. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 21e. Site 276. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

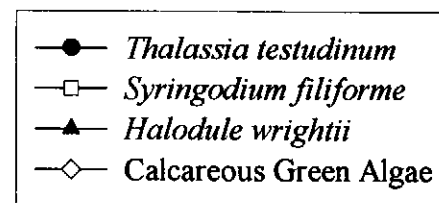
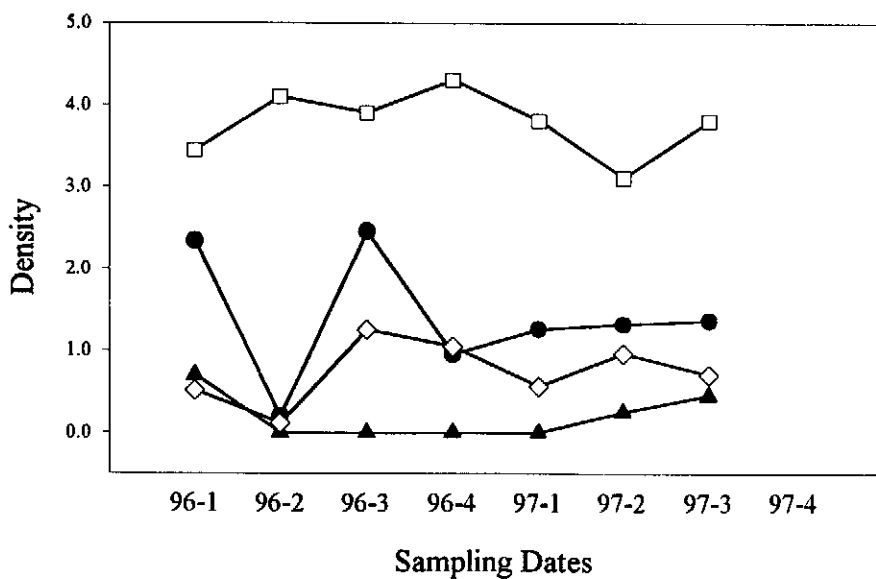
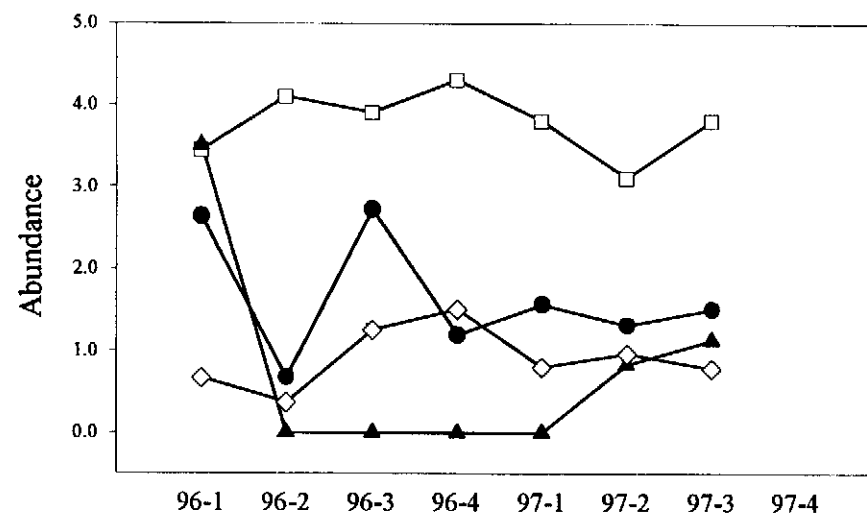
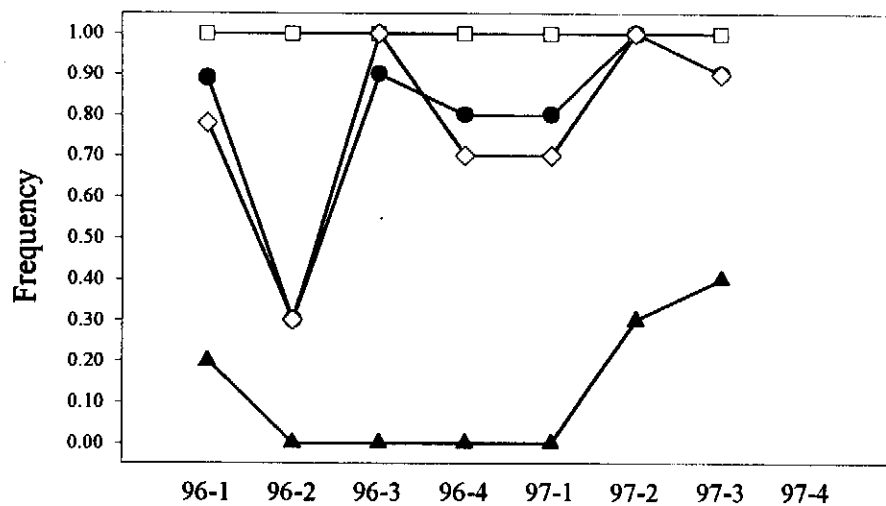
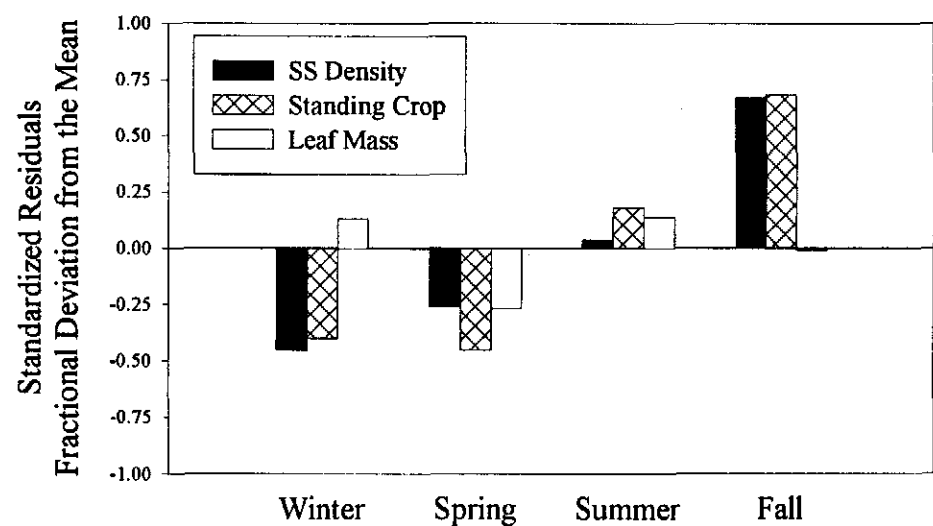
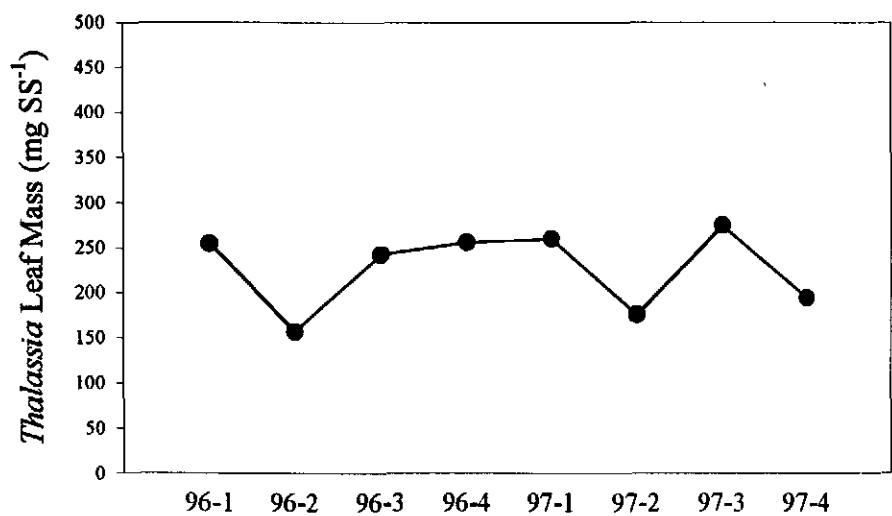
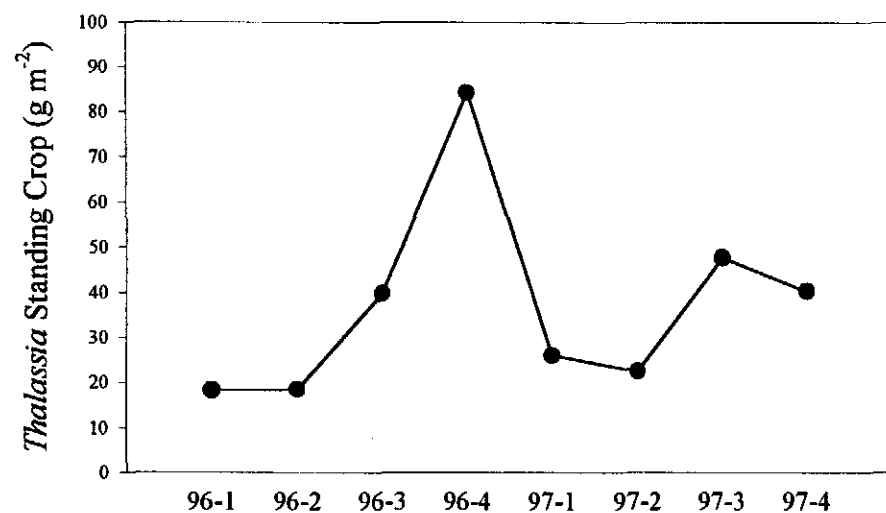
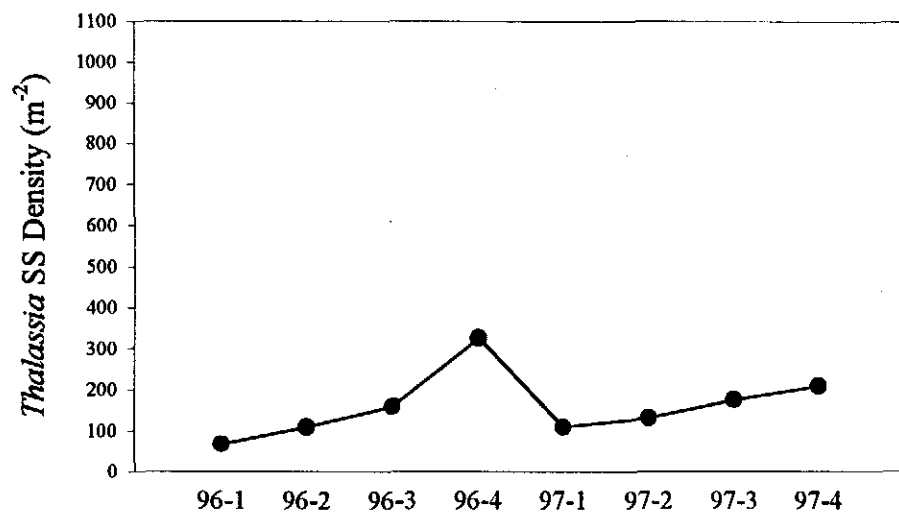
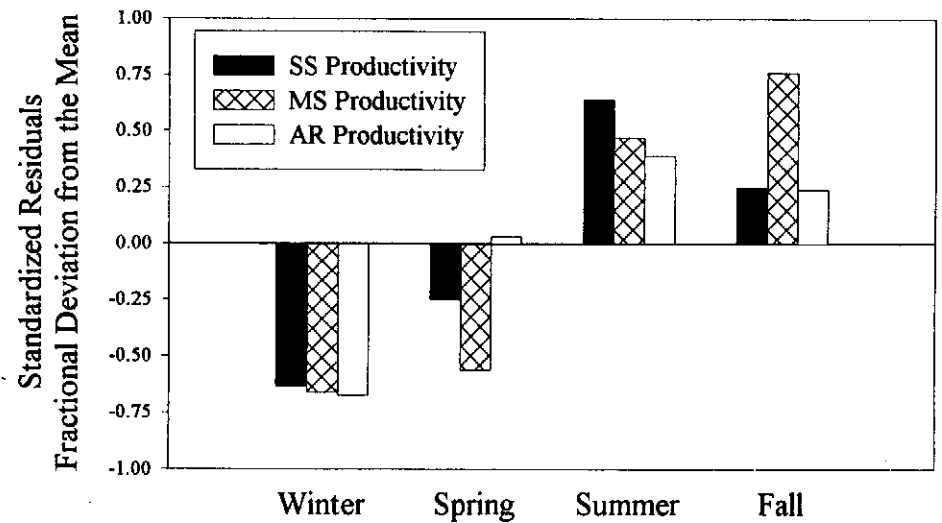
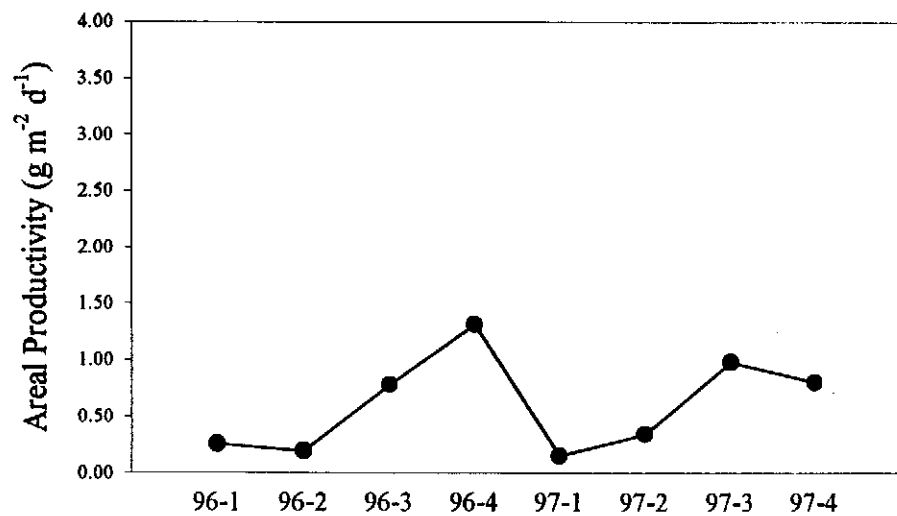
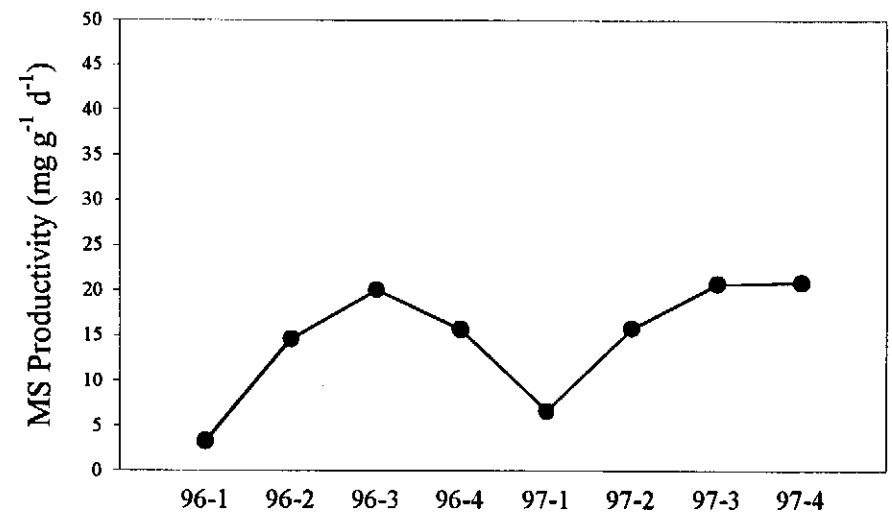
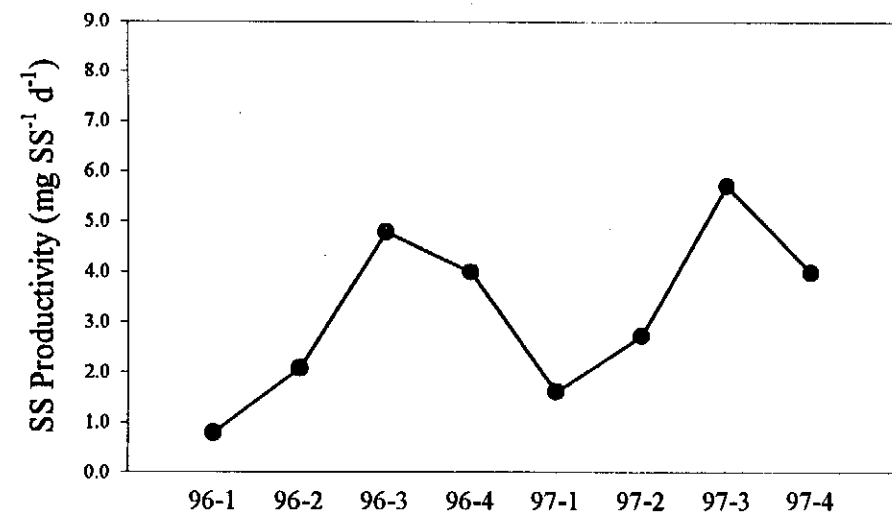


Figure 22a. Site 284. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 22b. Site 284. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 22c. Site 284. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

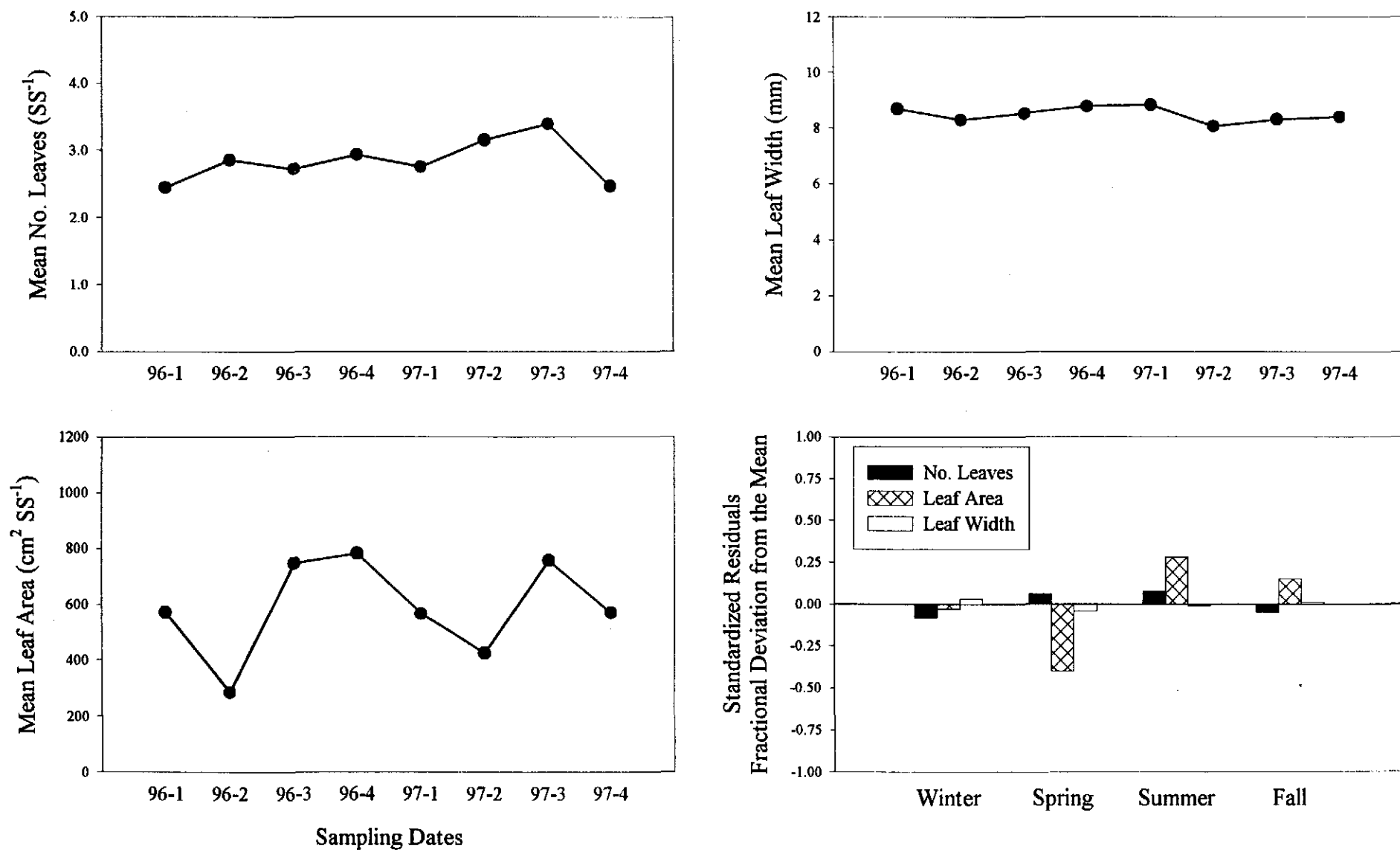
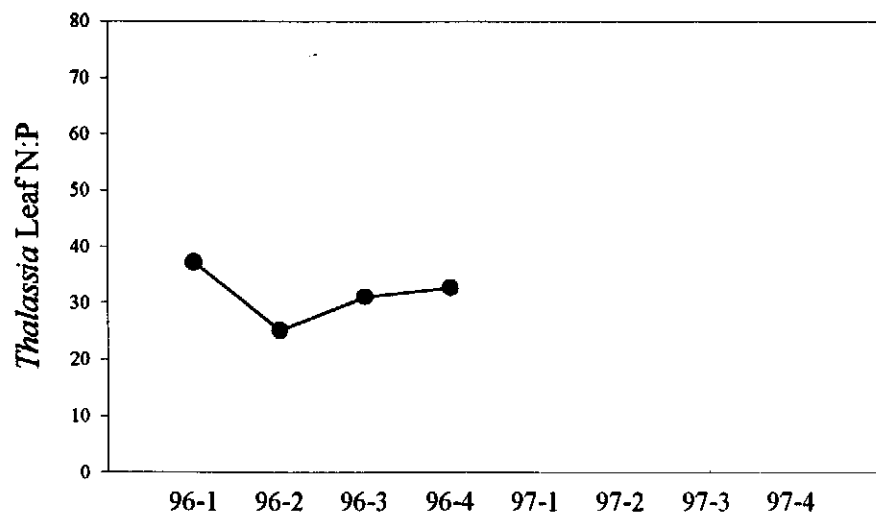
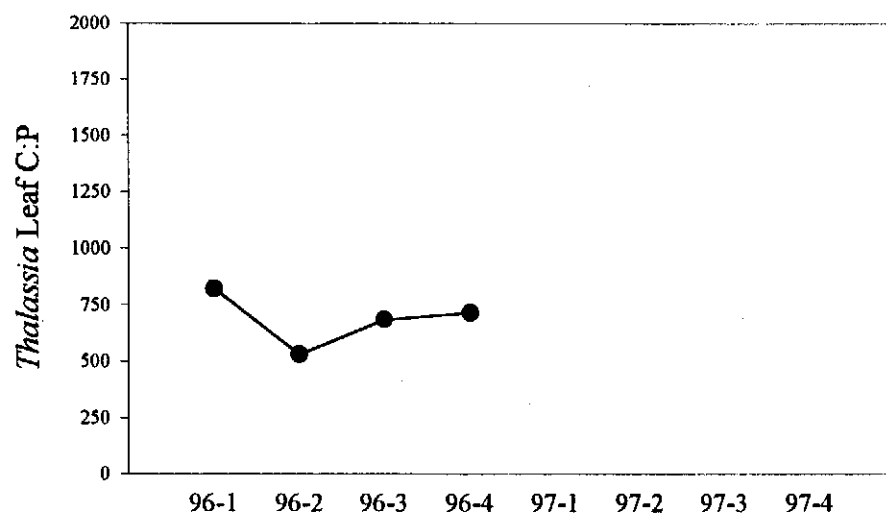
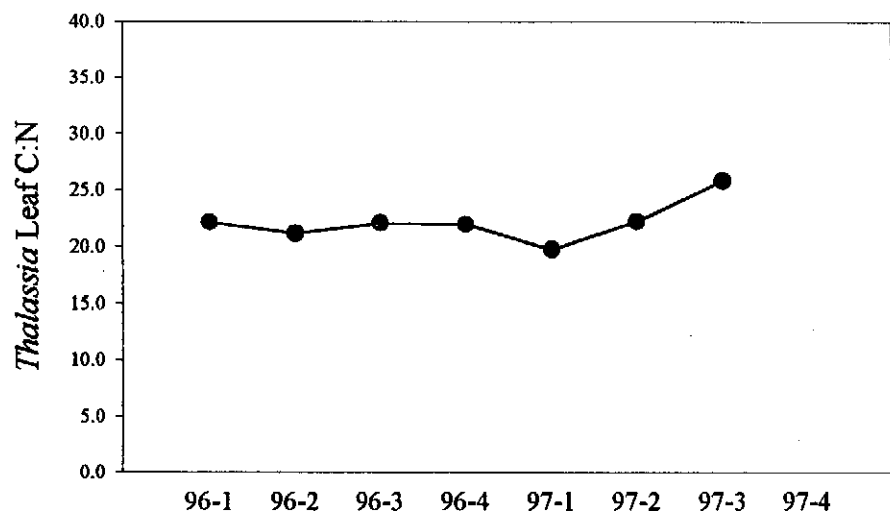


Figure 22d. Site 284. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 22e. Site 284. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

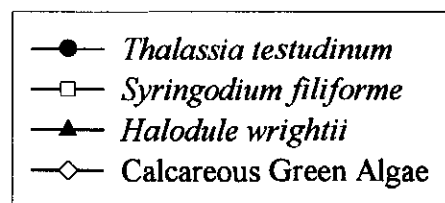
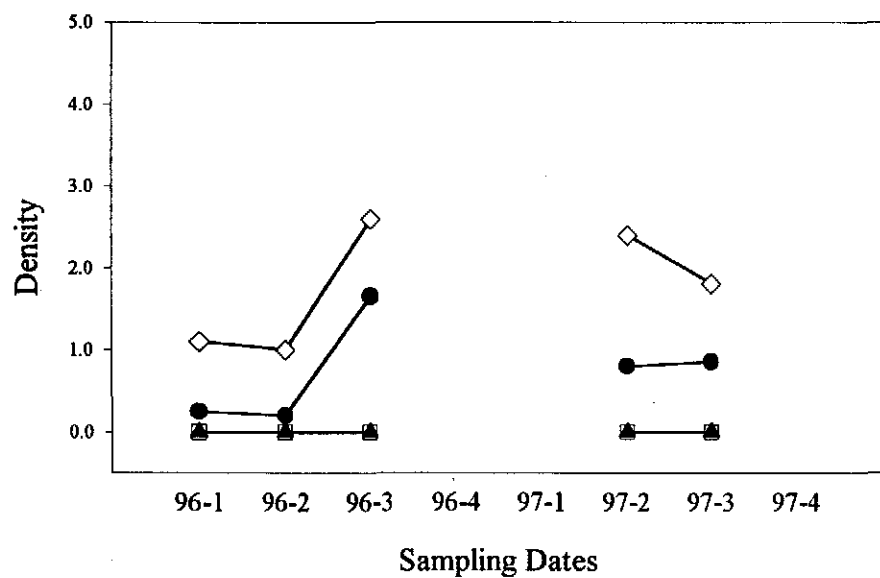
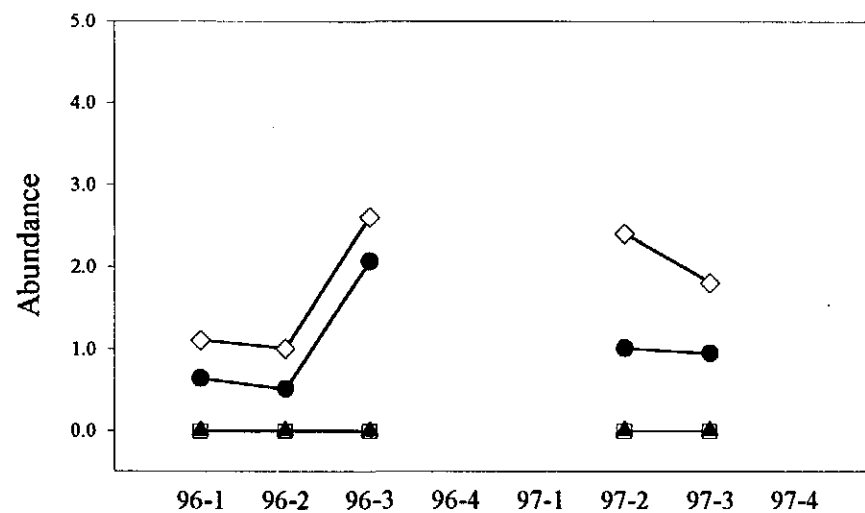
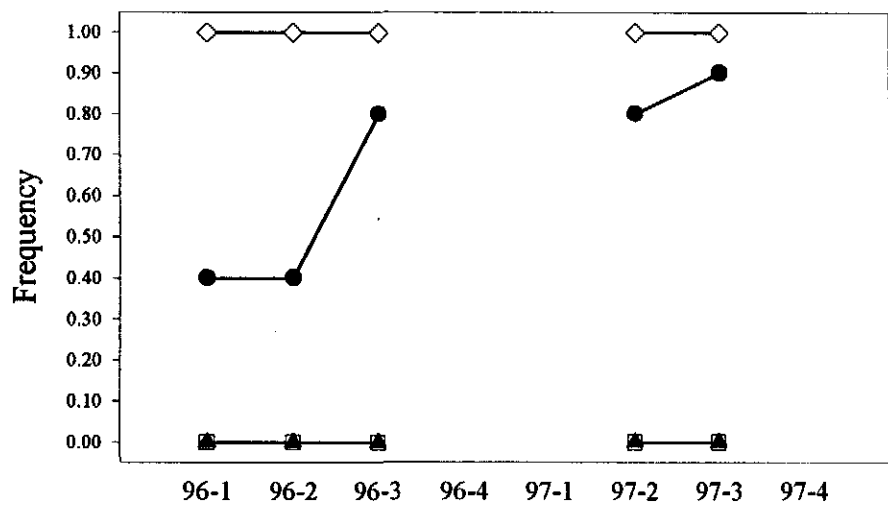
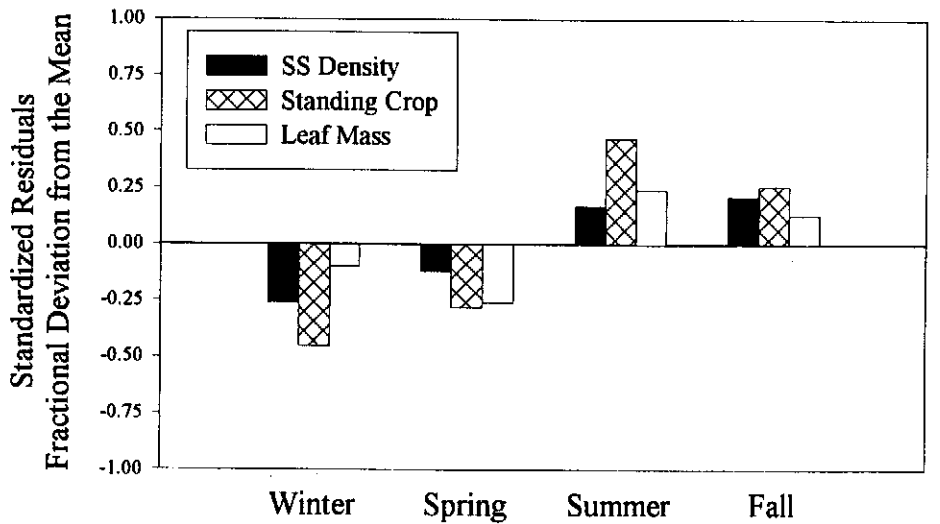
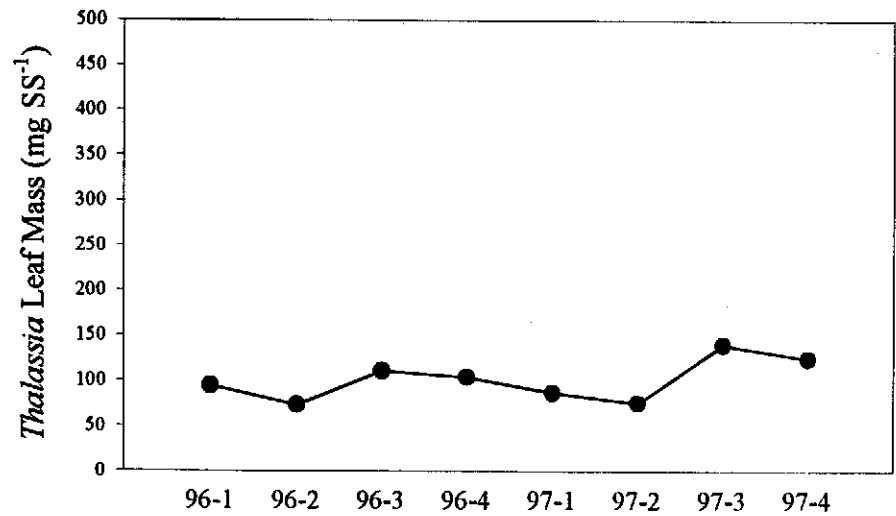
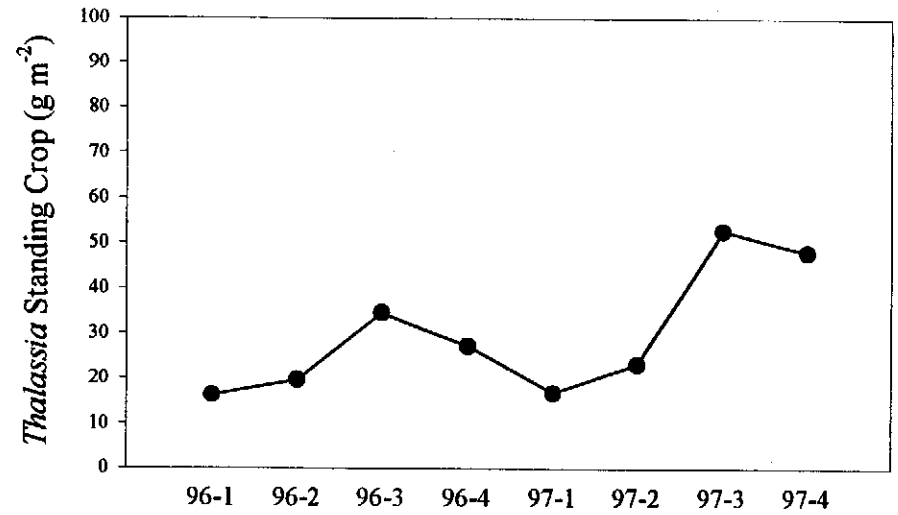
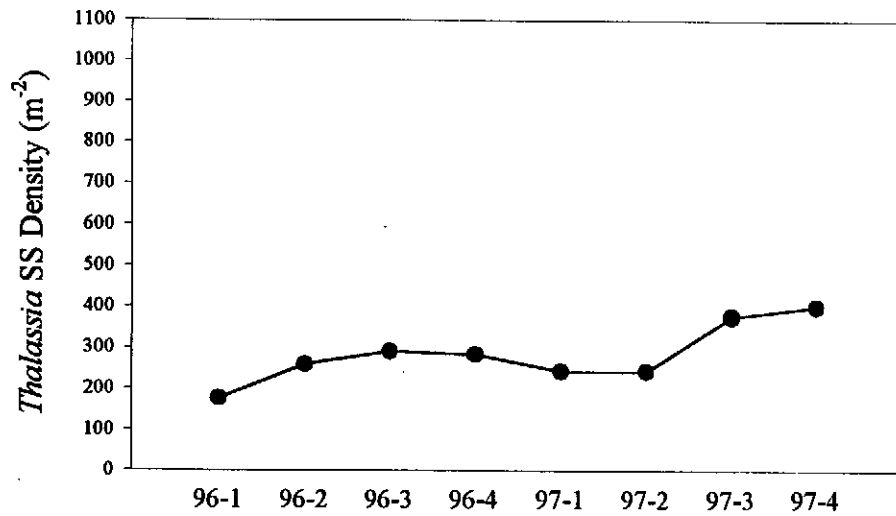
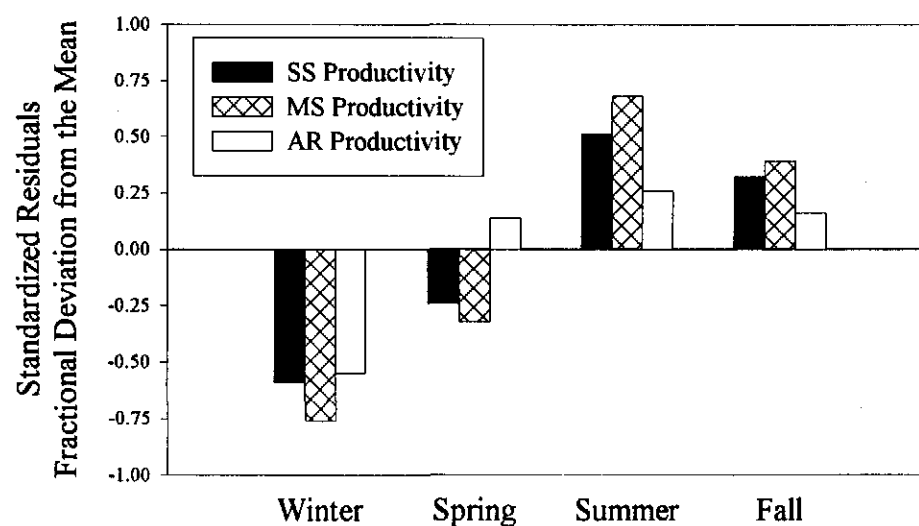
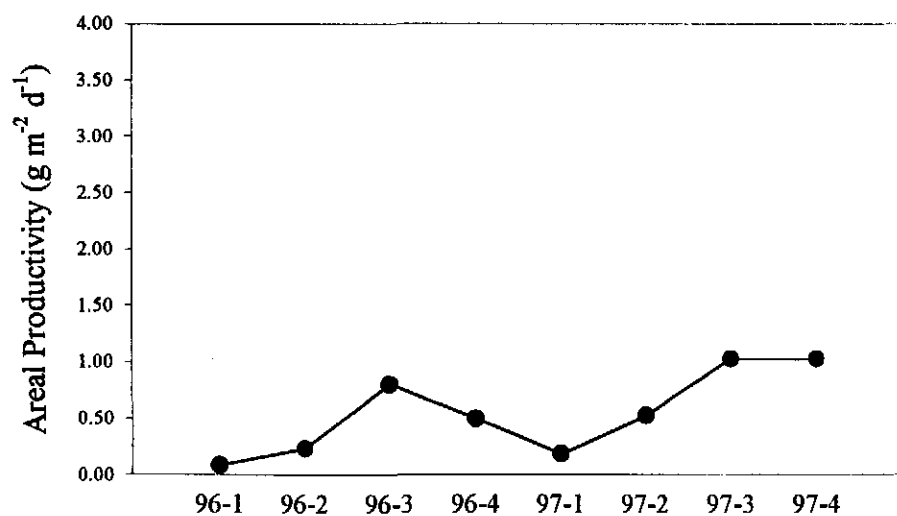
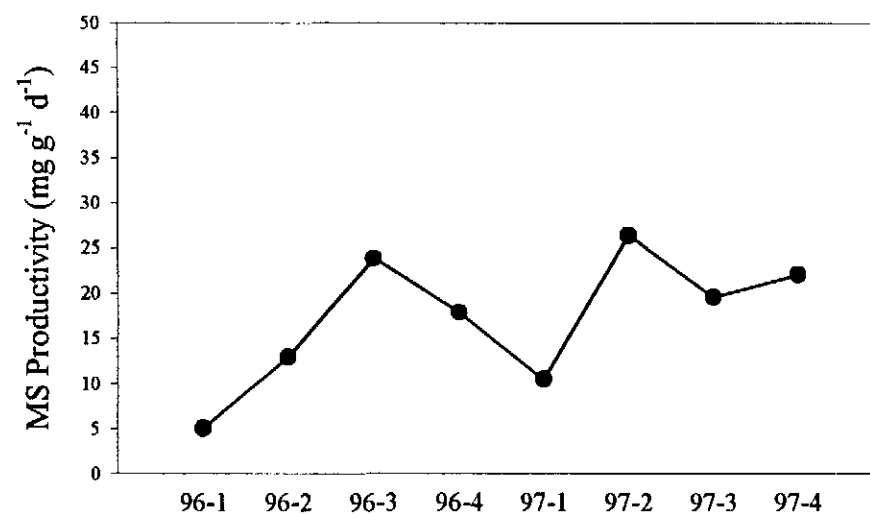
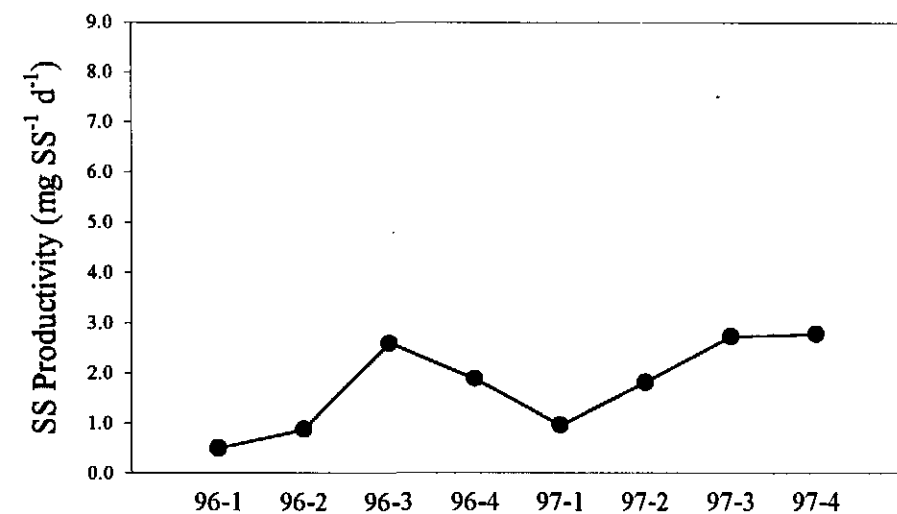


Figure 23a. Site 285. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 23b. Site 285. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 23c. Site 285. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

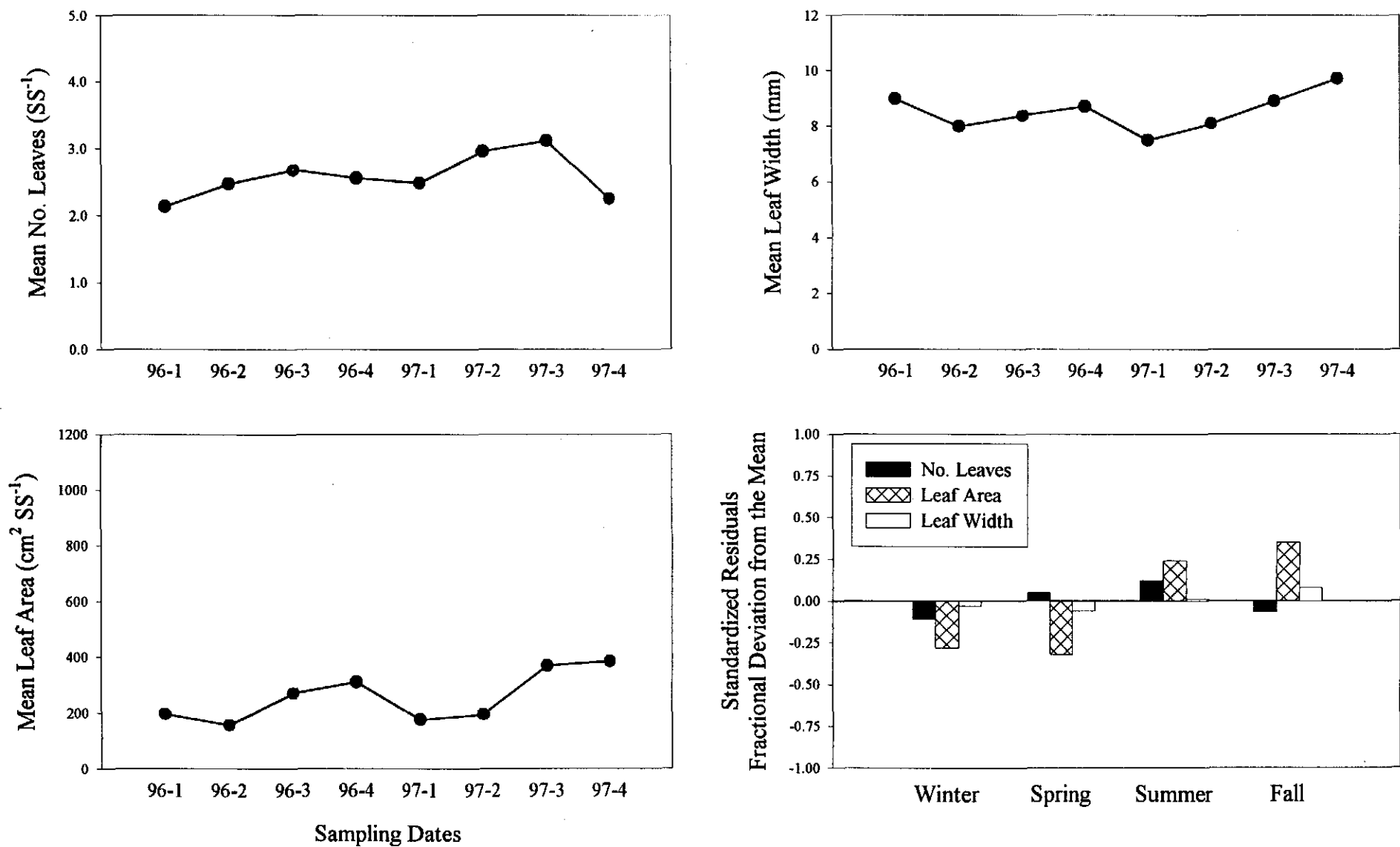
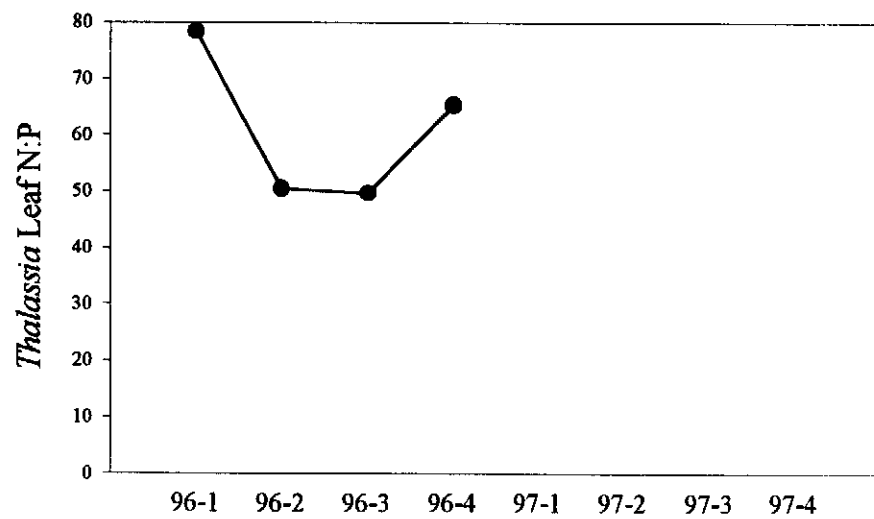
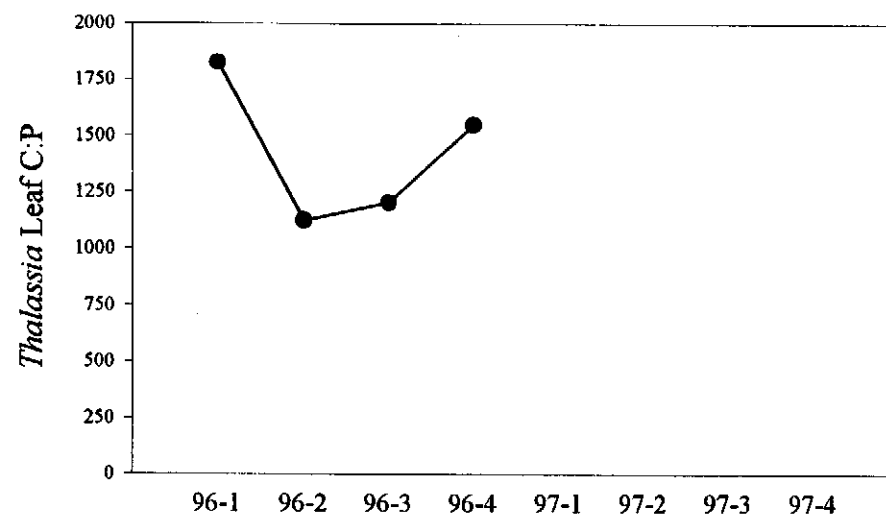
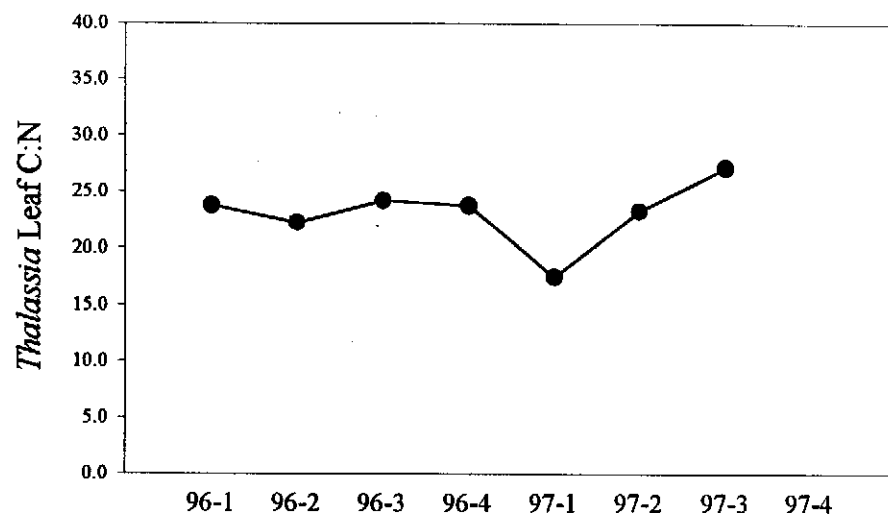


Figure 23d. Site 285. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 23e. Site 285. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

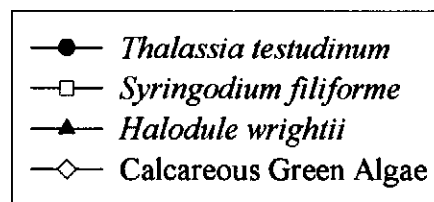
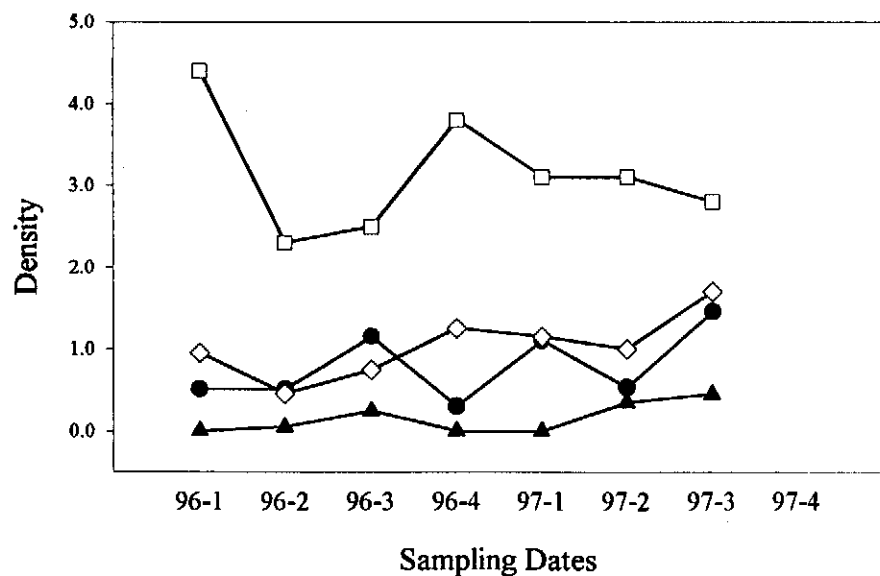
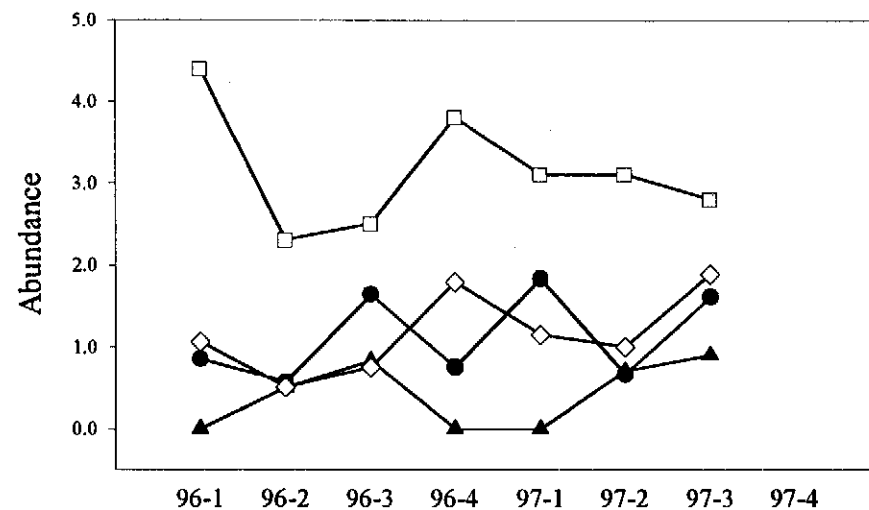
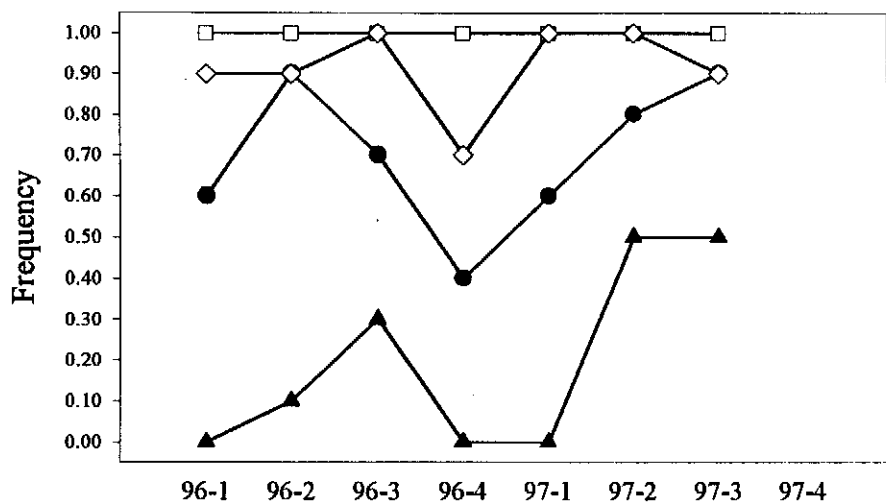
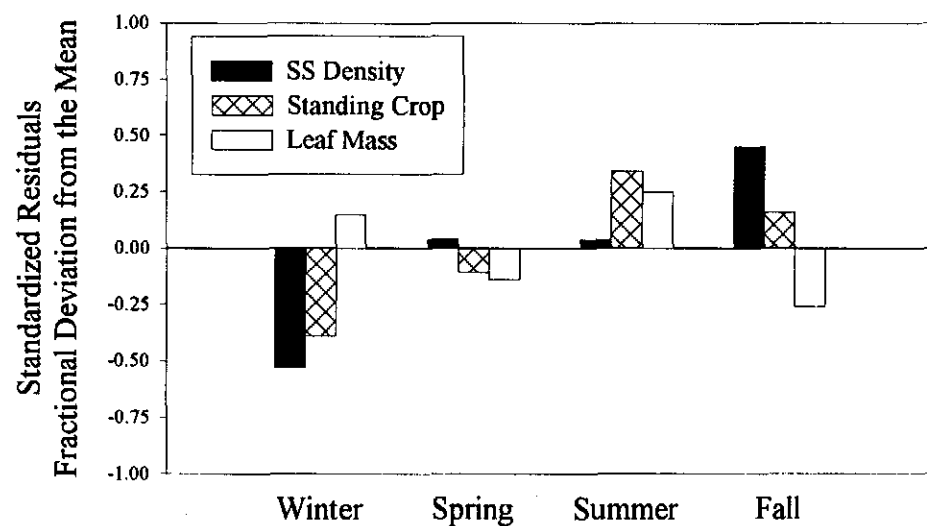
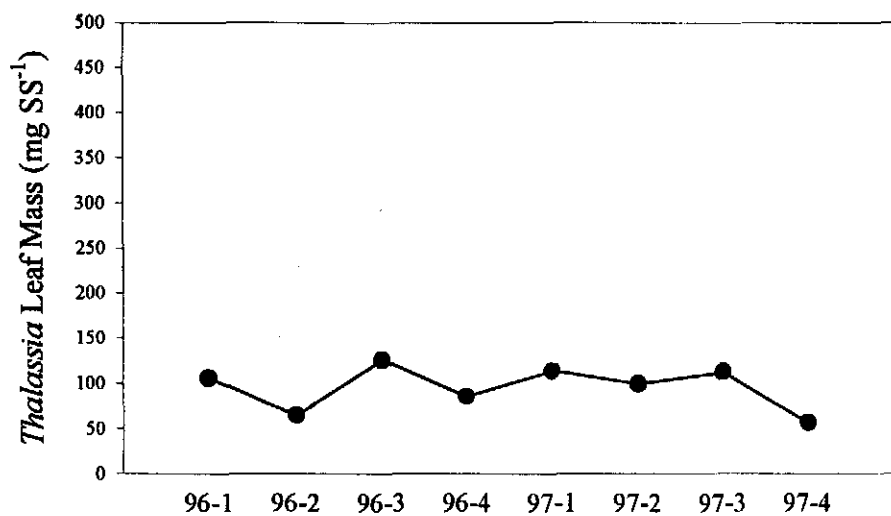
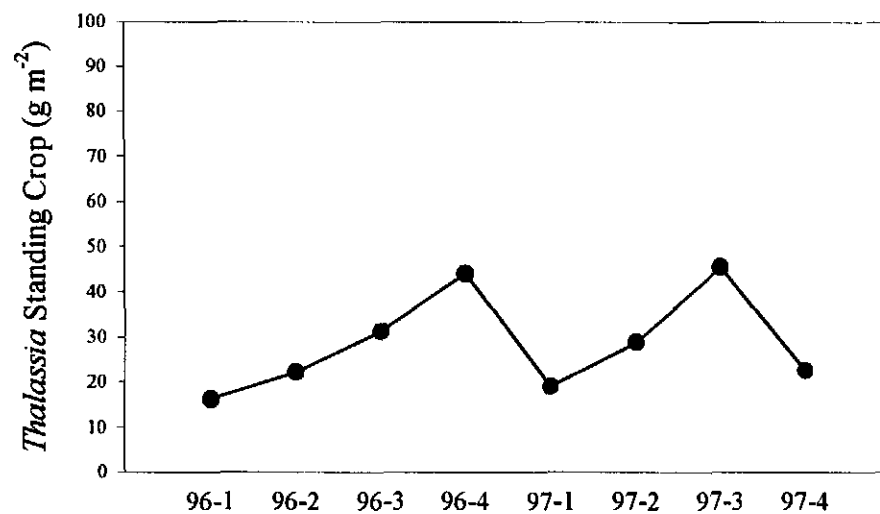
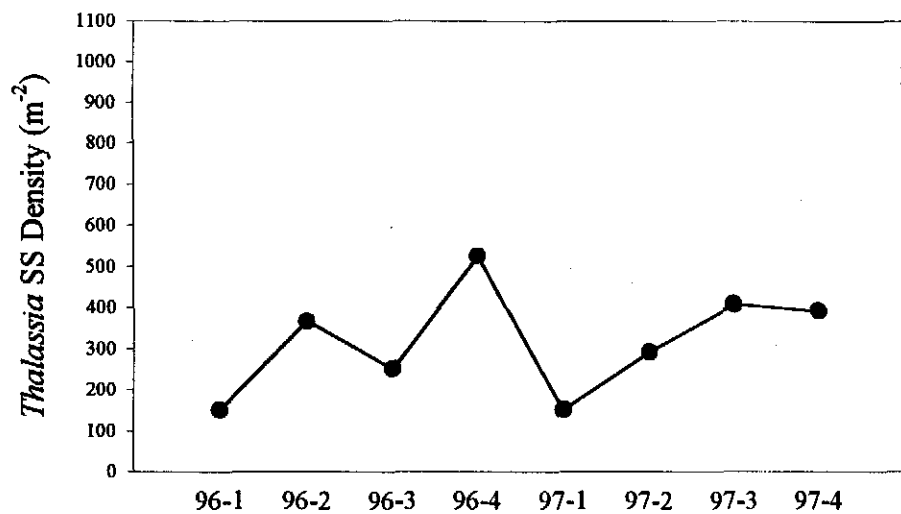
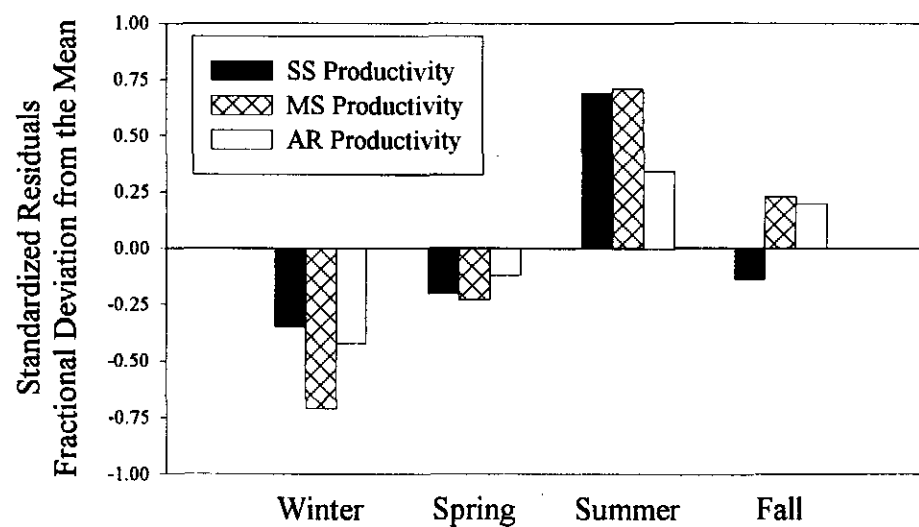
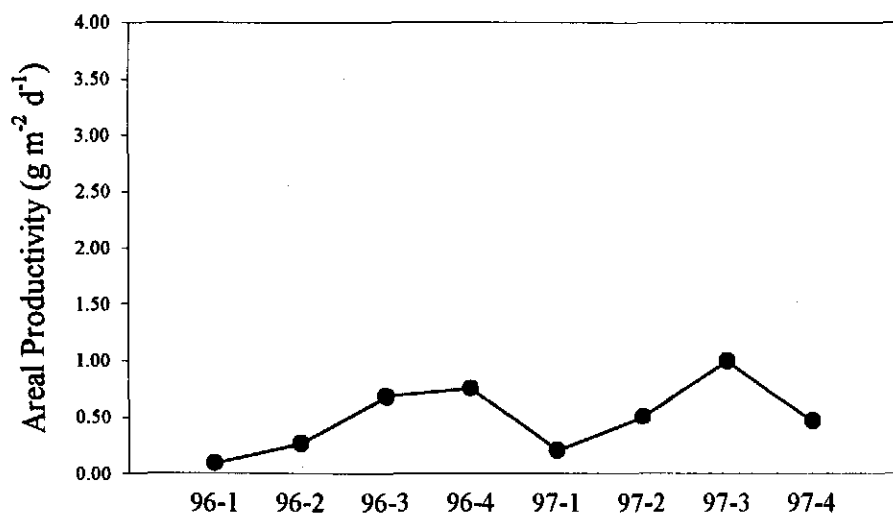
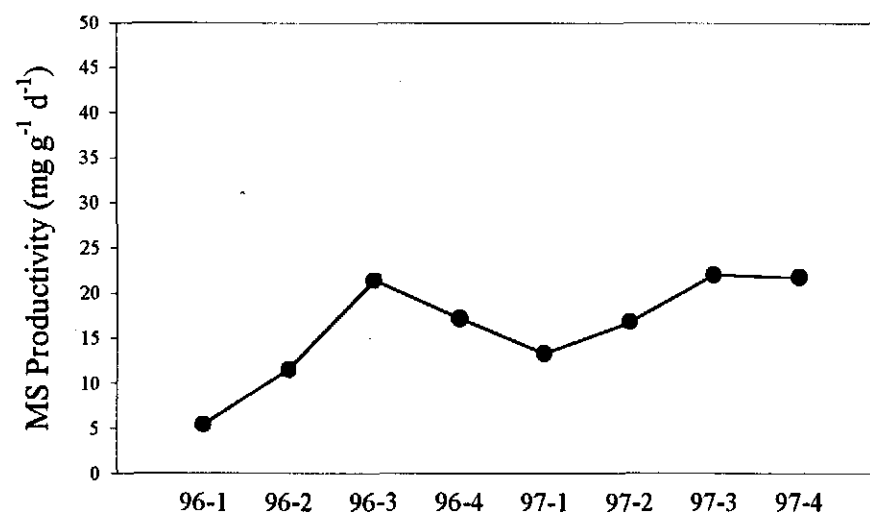
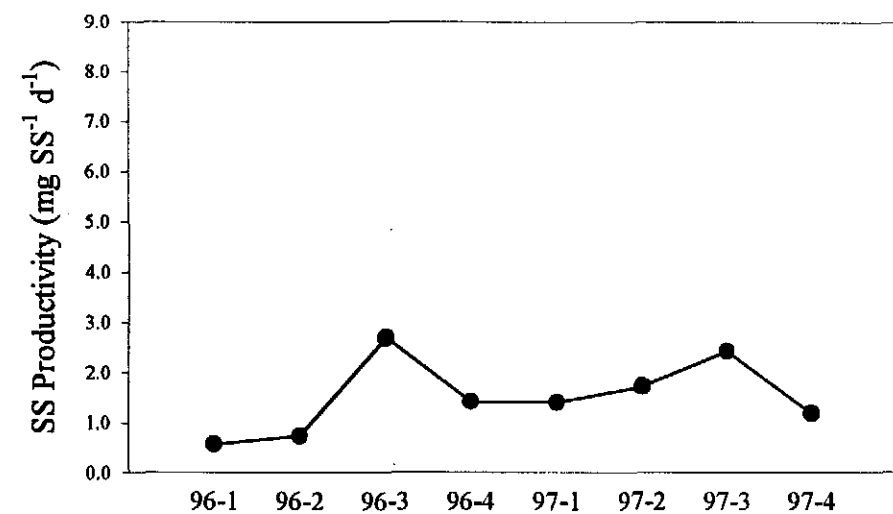


Figure 24a. Site 287. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 24b. Site 287. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 24c. Site 287. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

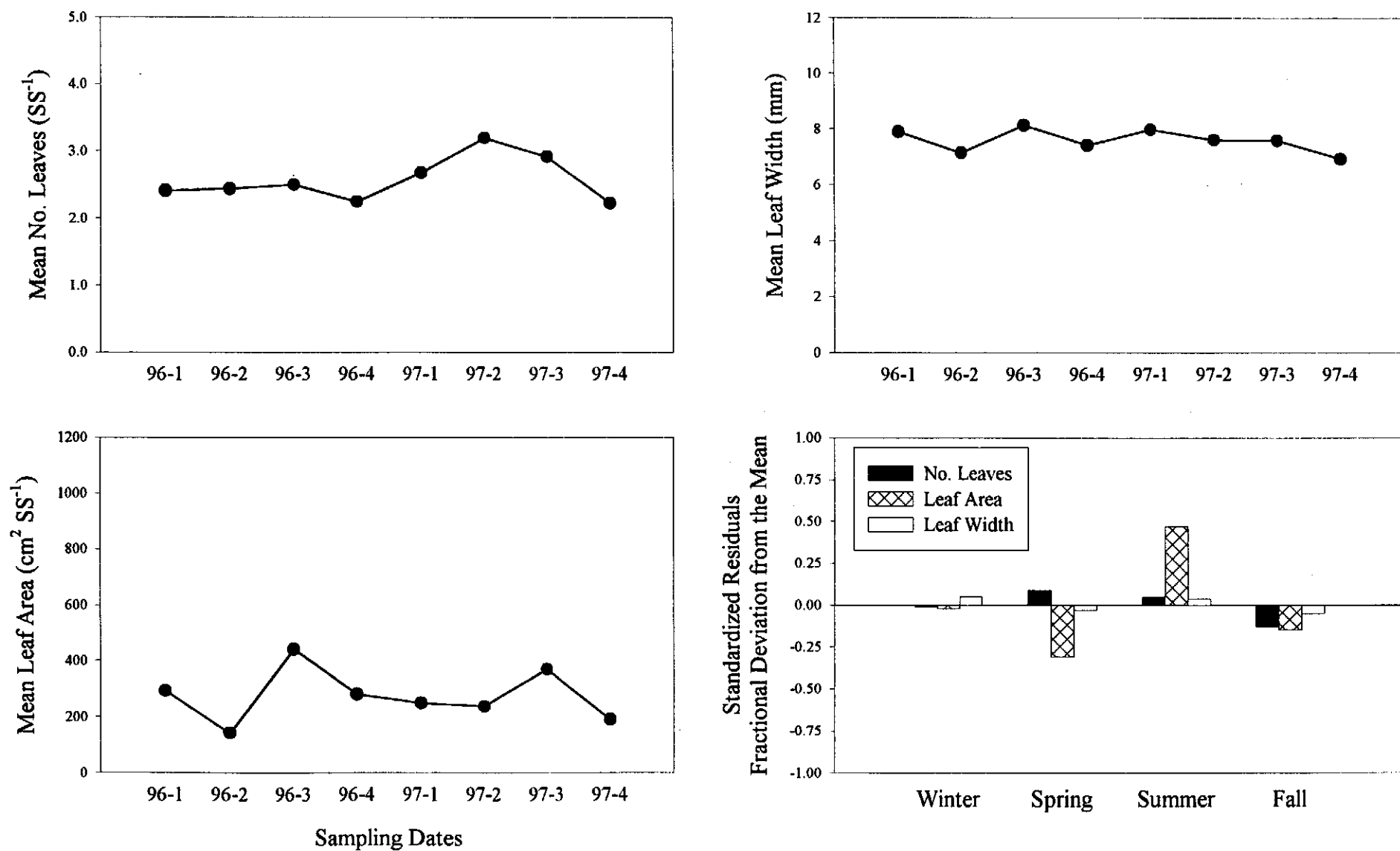
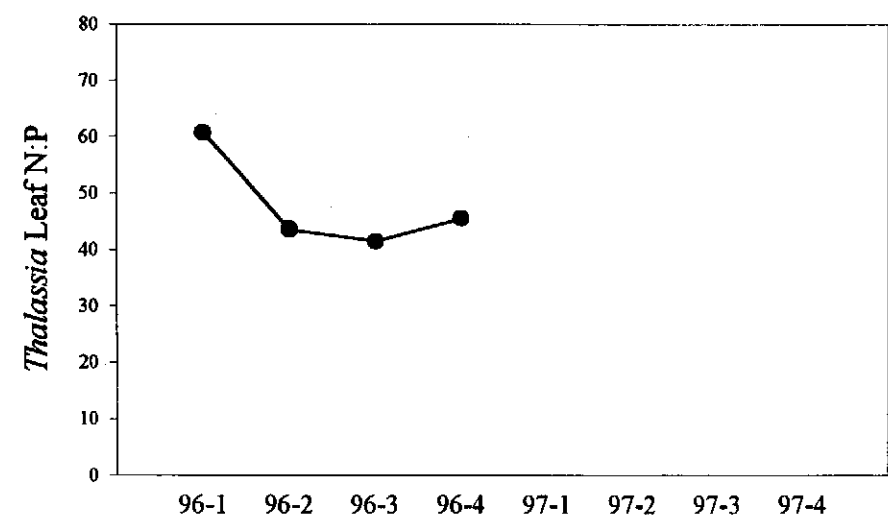
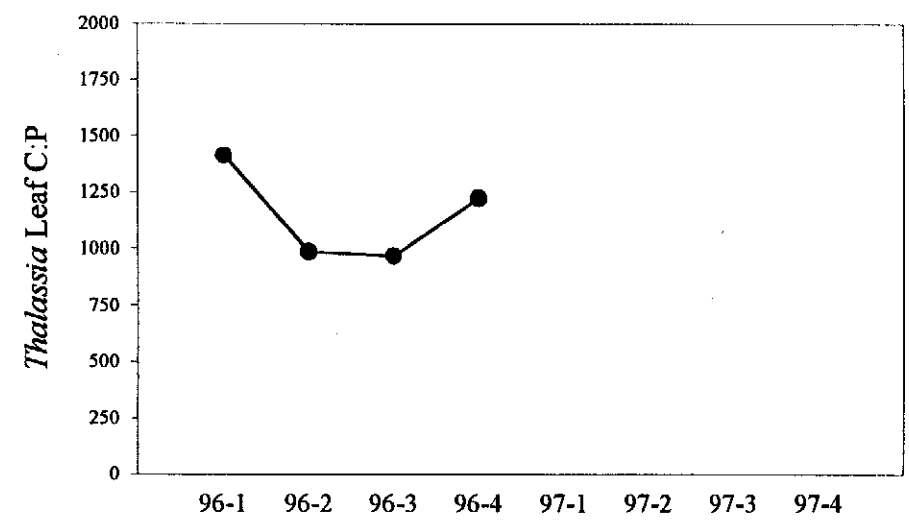
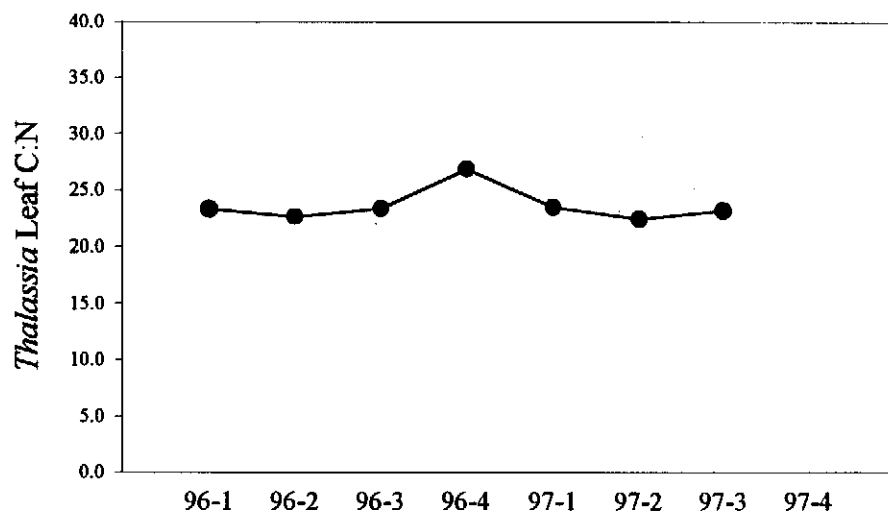
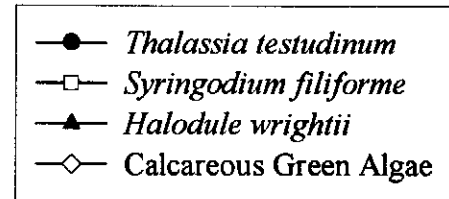
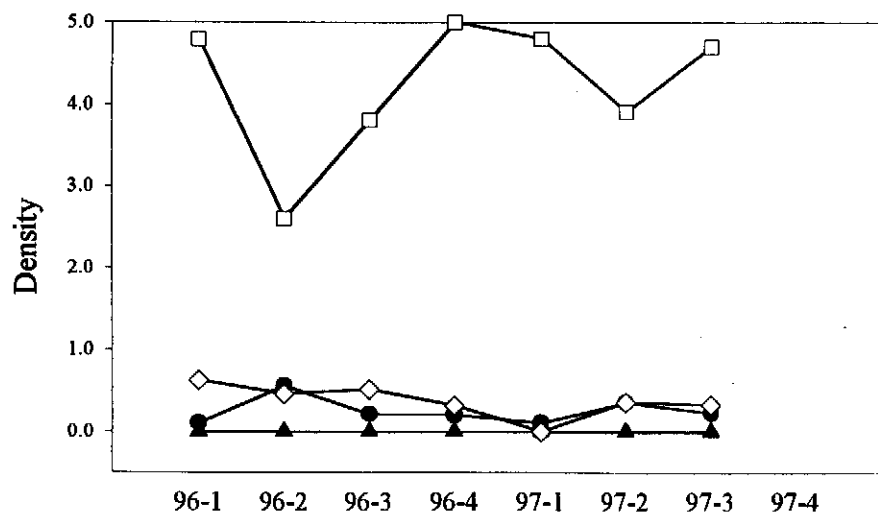
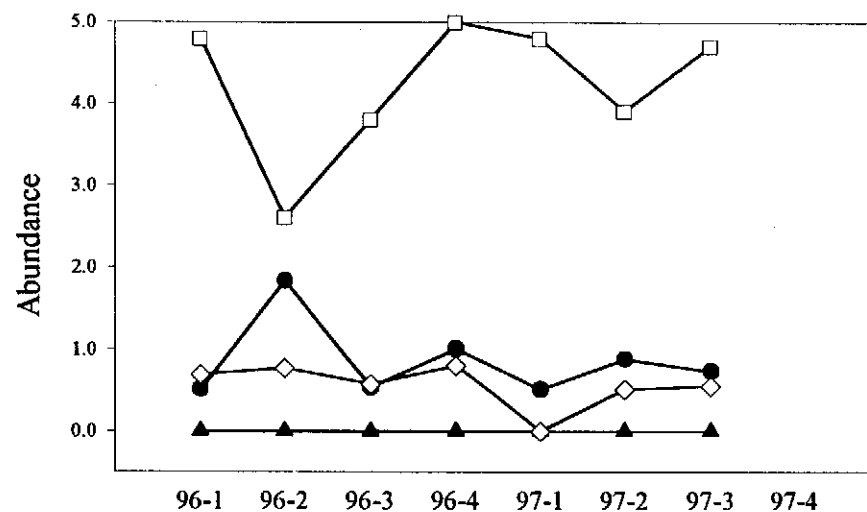
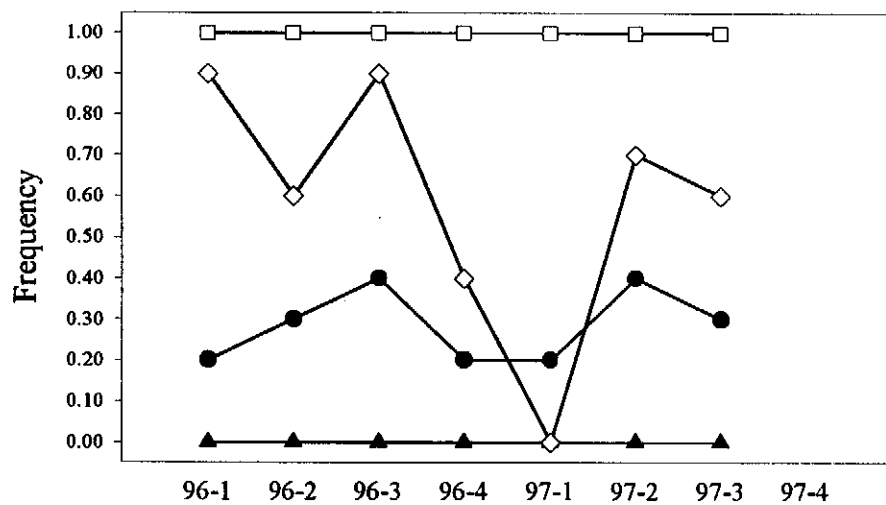


Figure 24d. Site 287. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



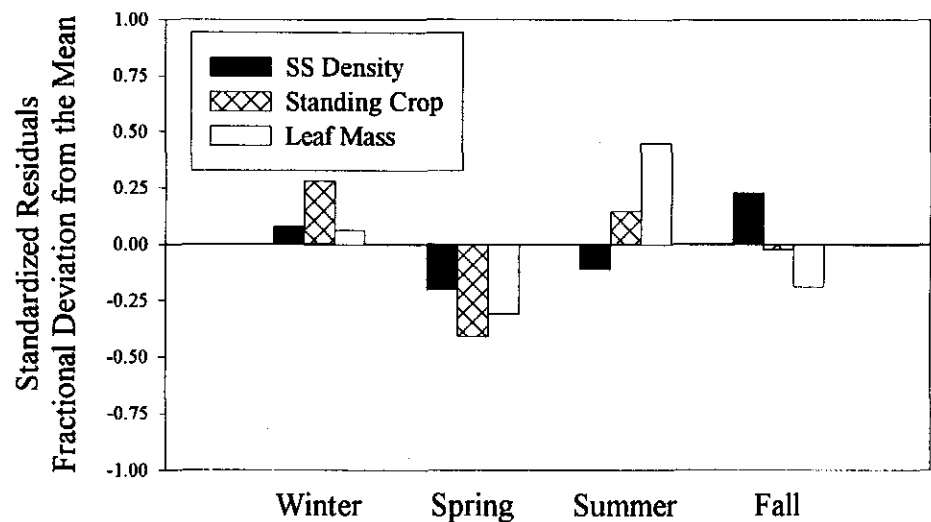
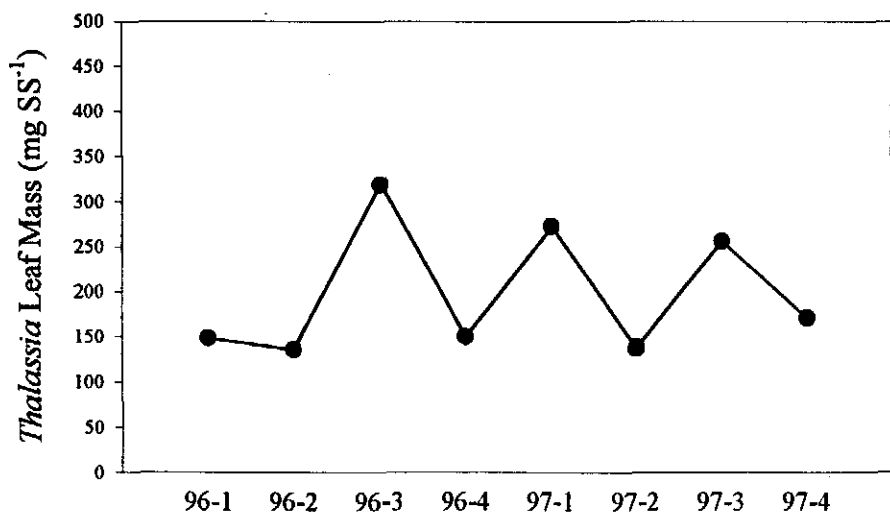
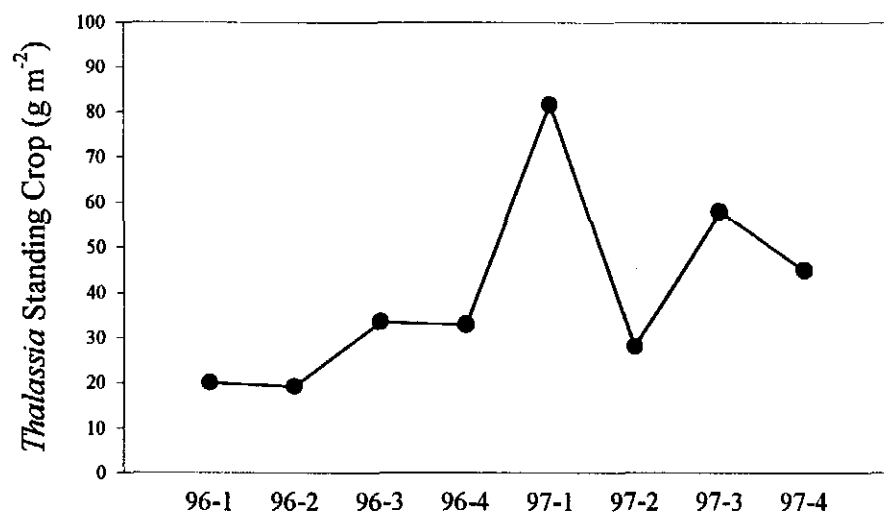
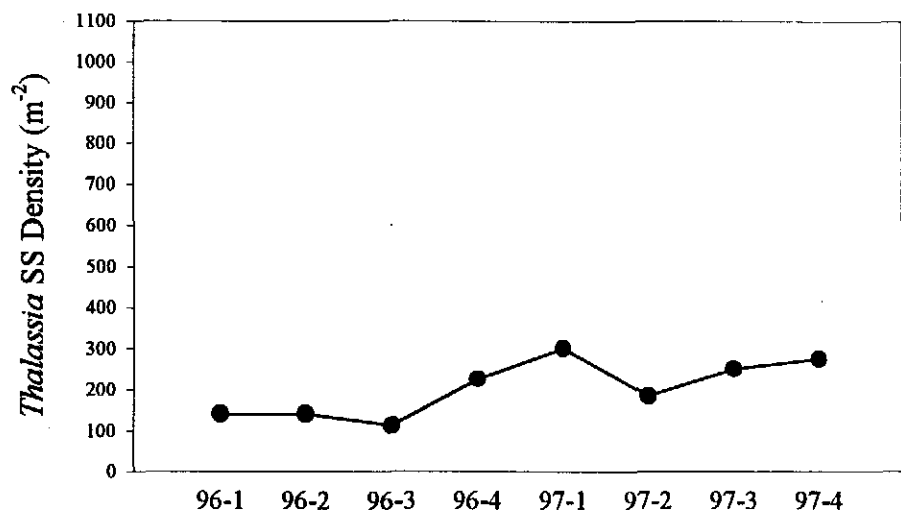
Sampling Dates

Figure 24e. Site 287. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



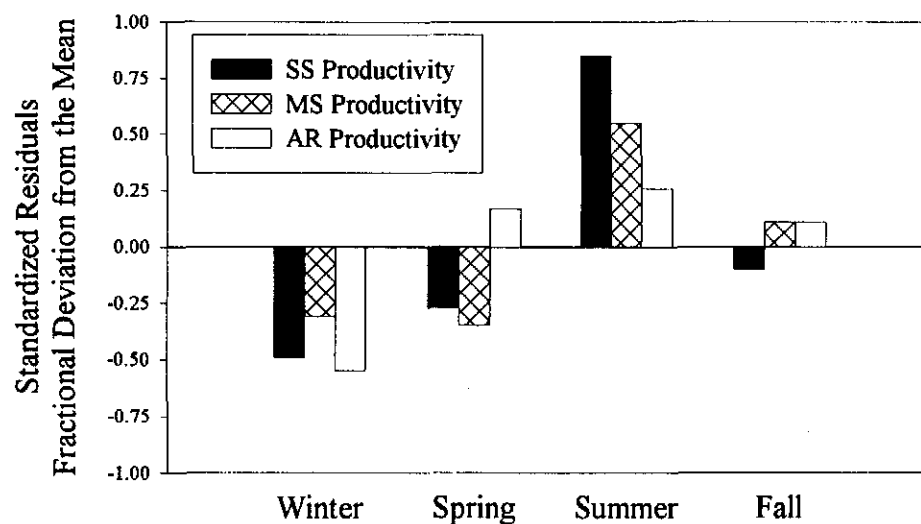
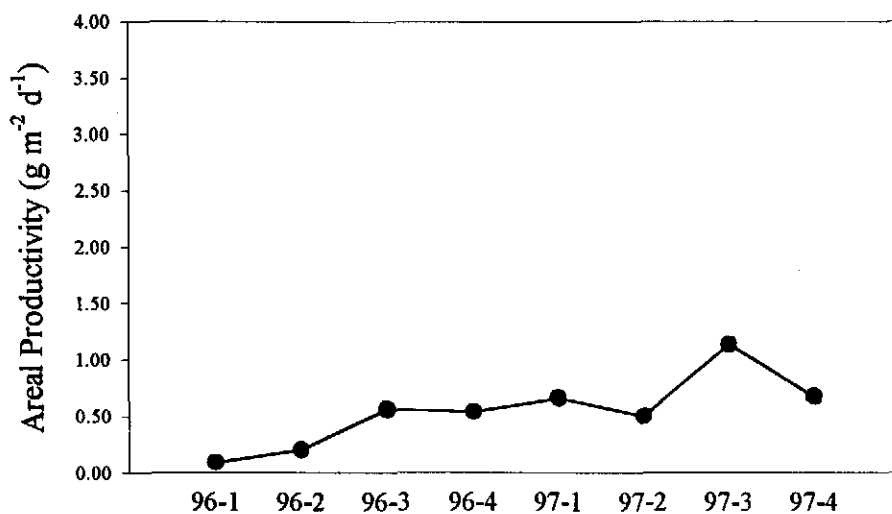
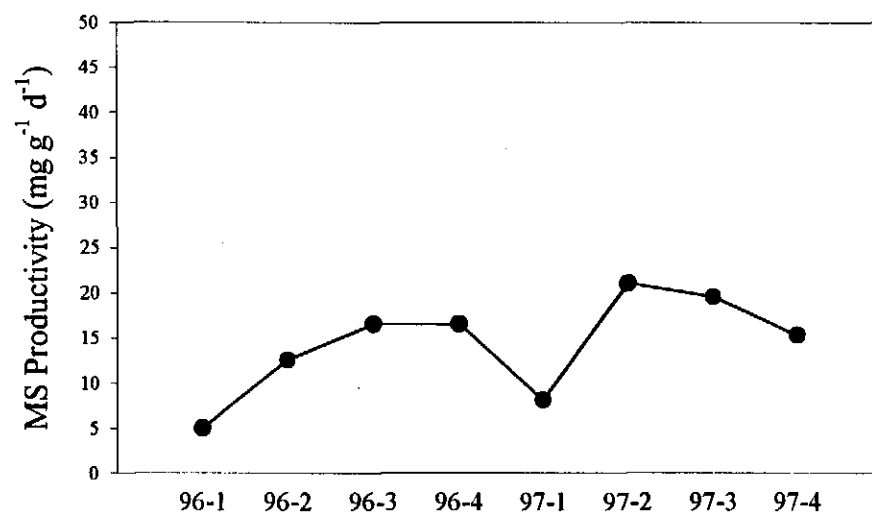
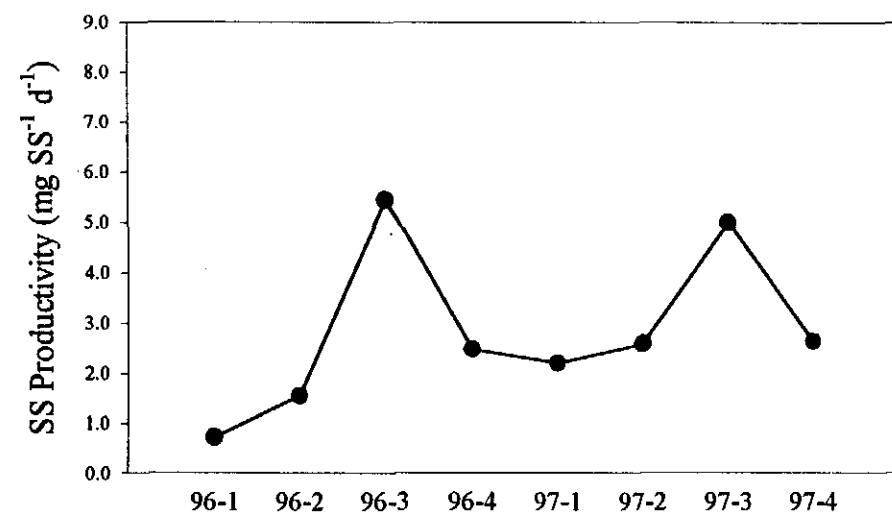
Sampling Dates

Figure 25a. Site 291. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 25b. Site 291. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 25c. Site 291. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

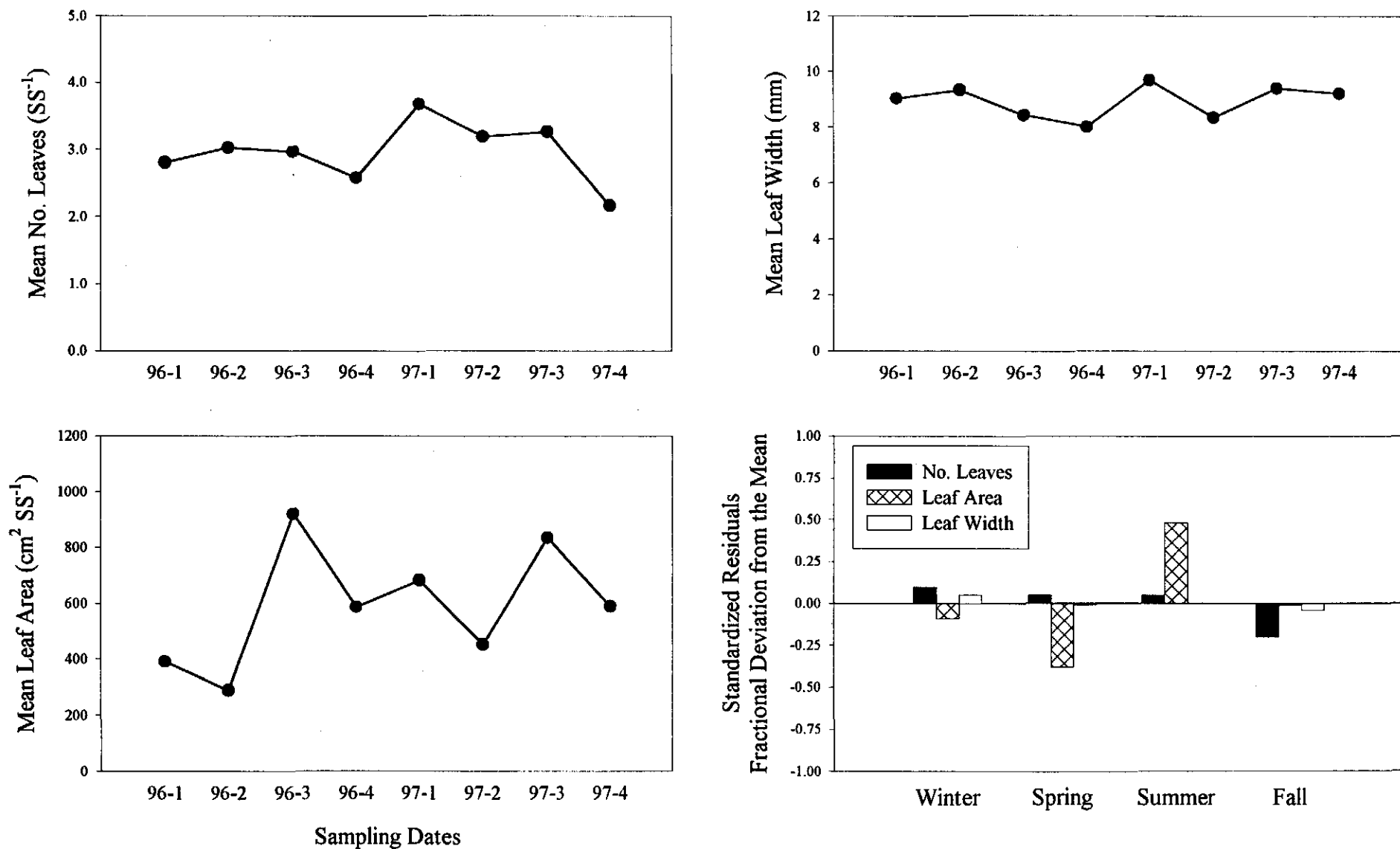


Figure 25d. Site 291. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

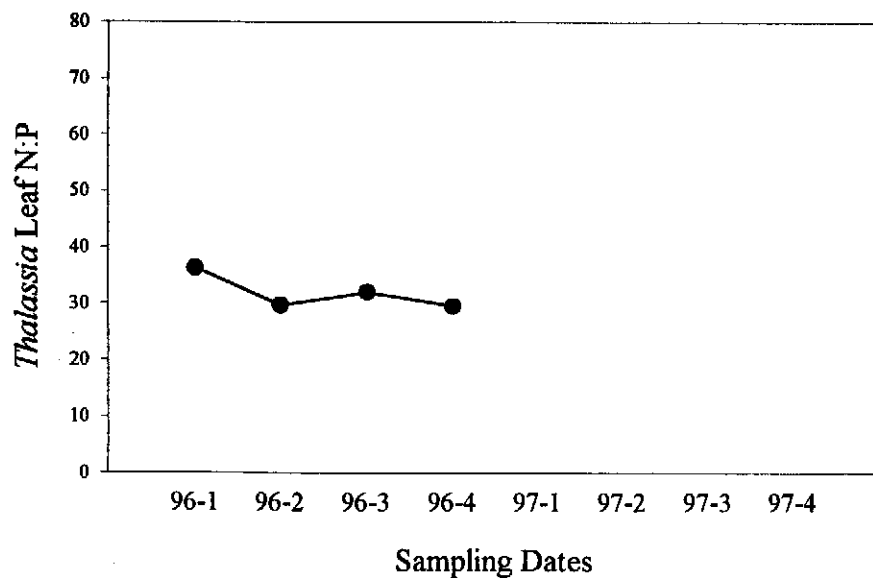
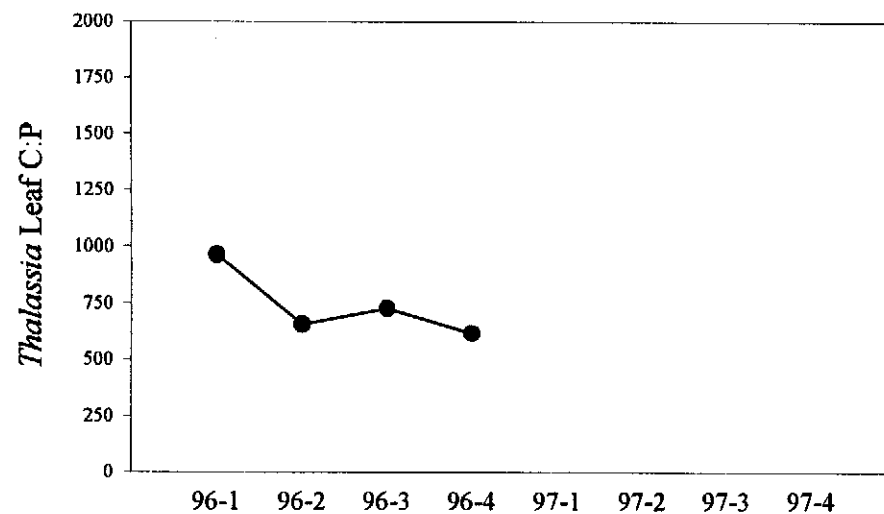
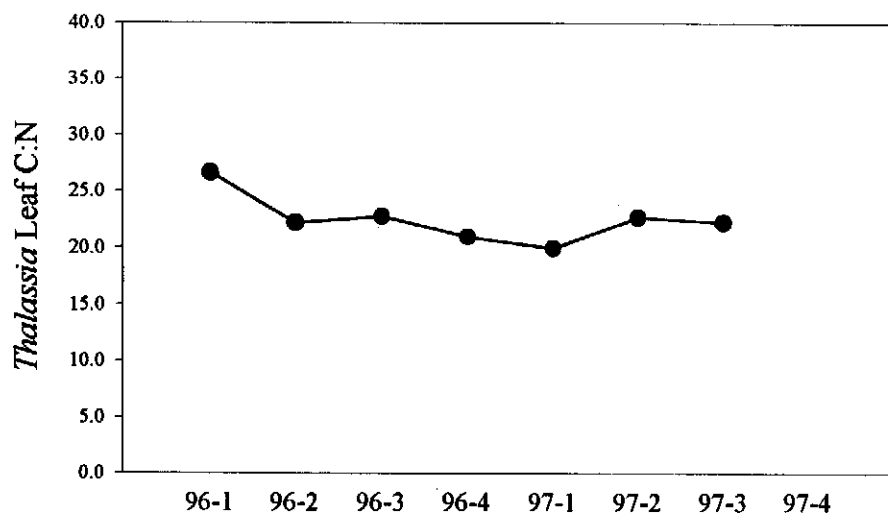


Figure 25e. Site 291. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

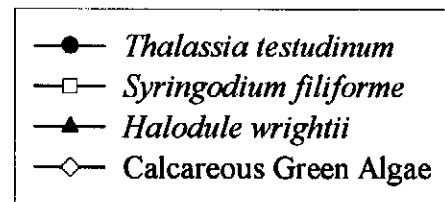
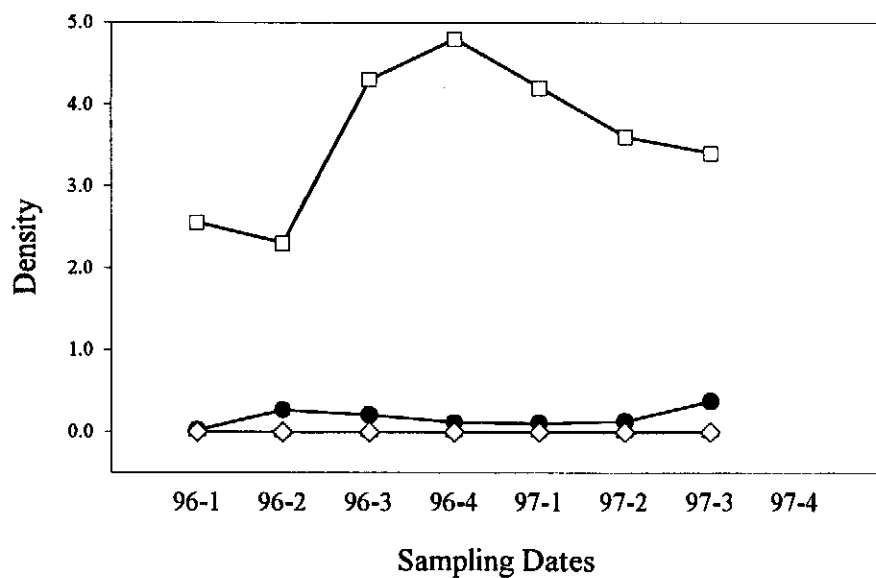
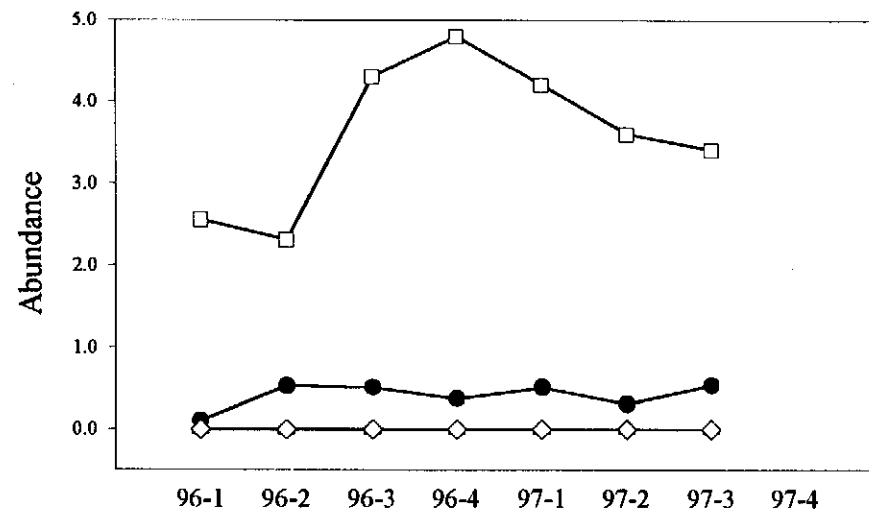
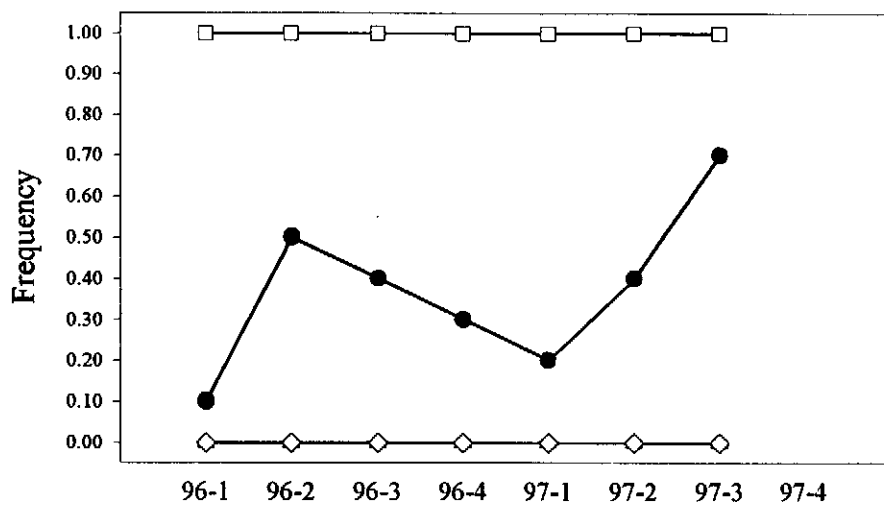
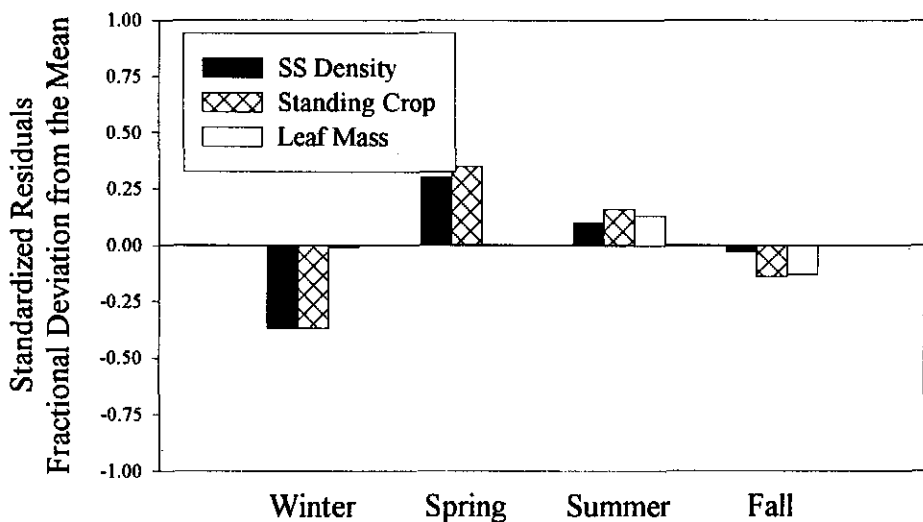
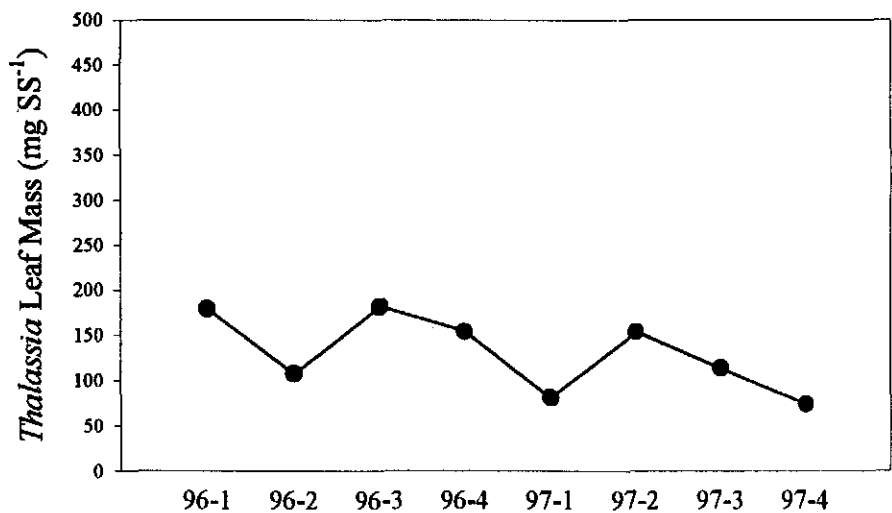
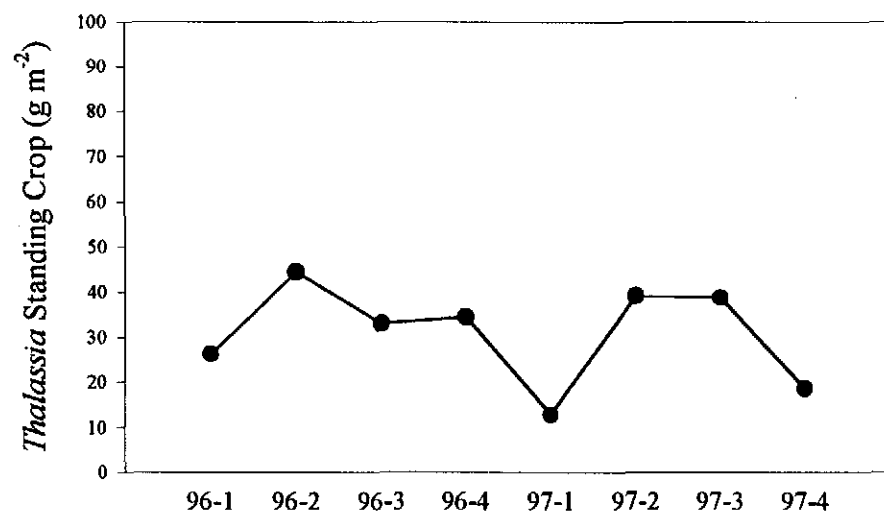
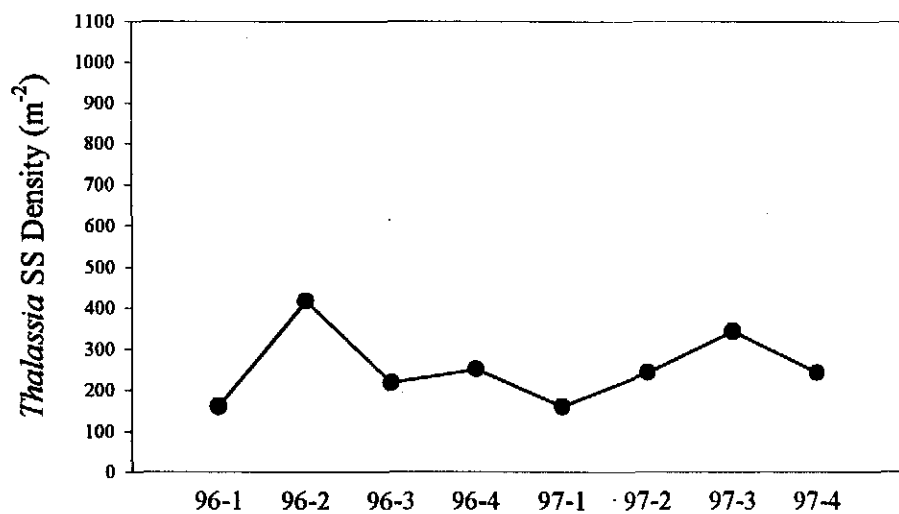
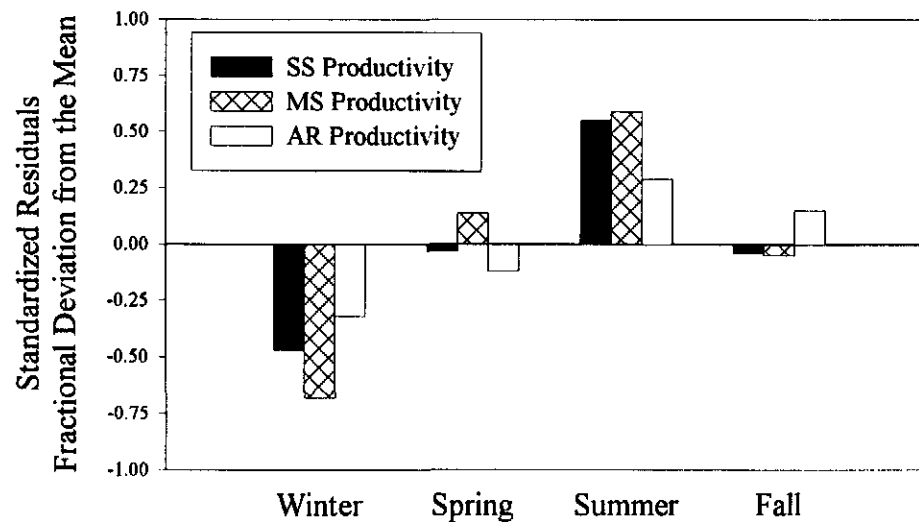
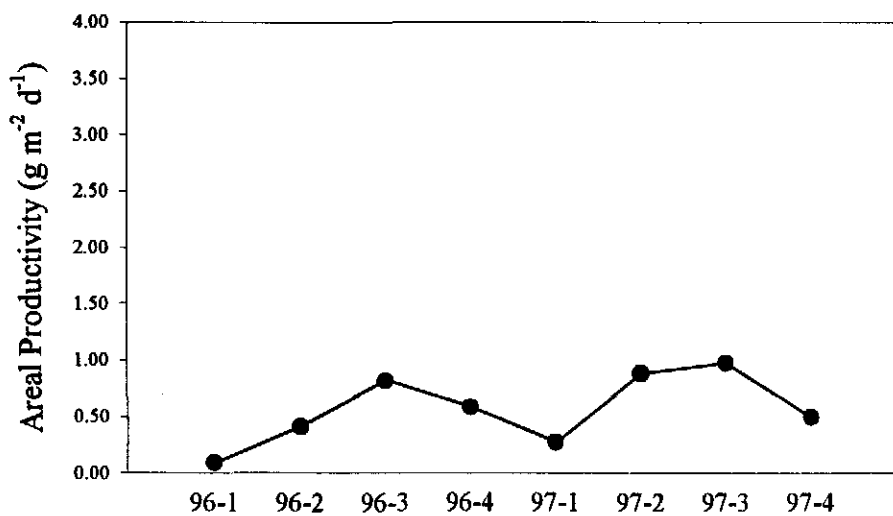
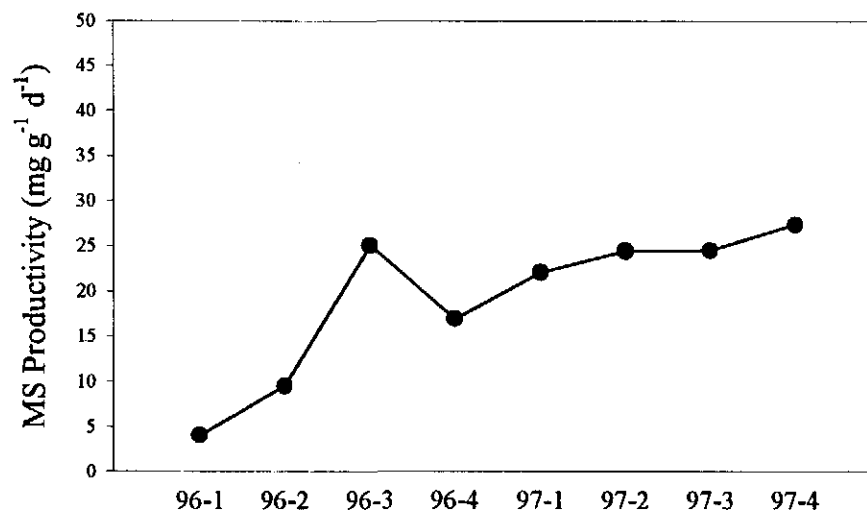
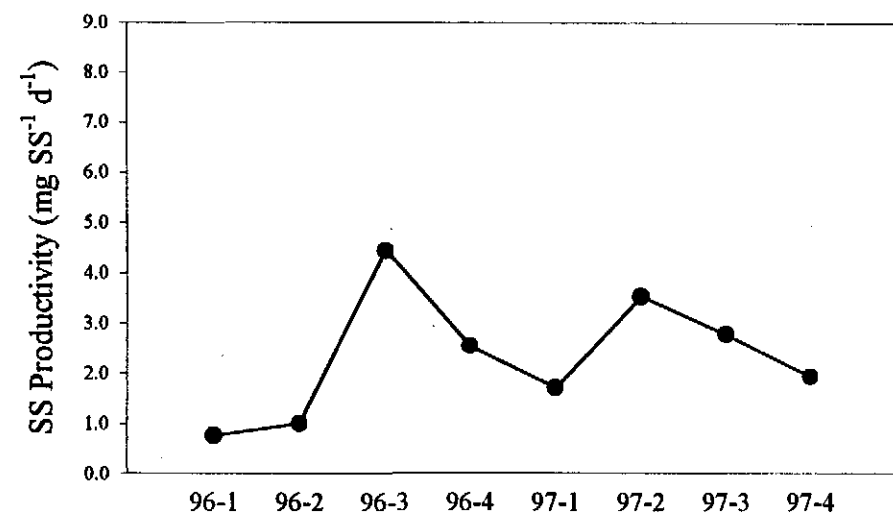


Figure 26a. Site 294. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 26b. Site 294. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 26c. Site 294. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

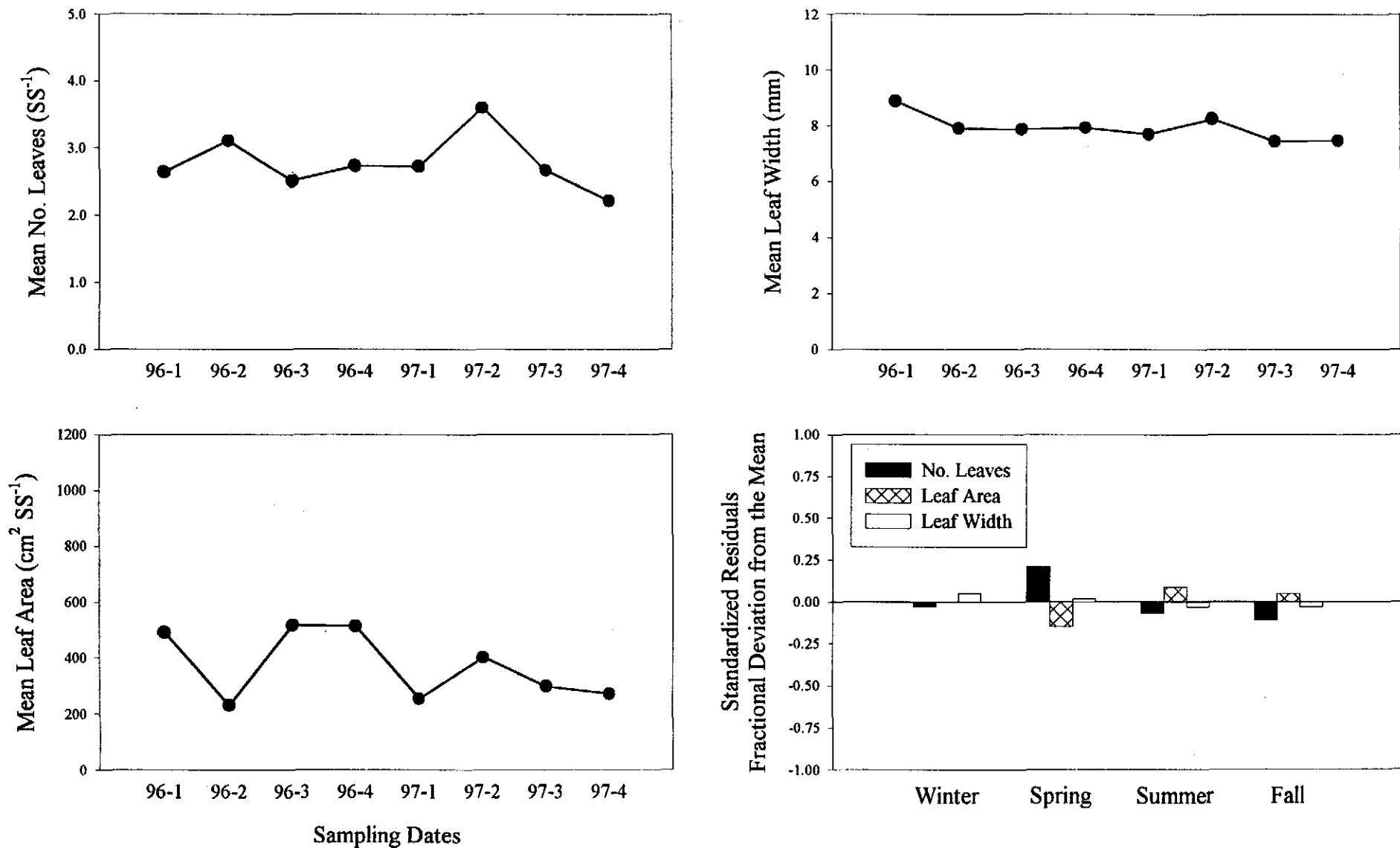
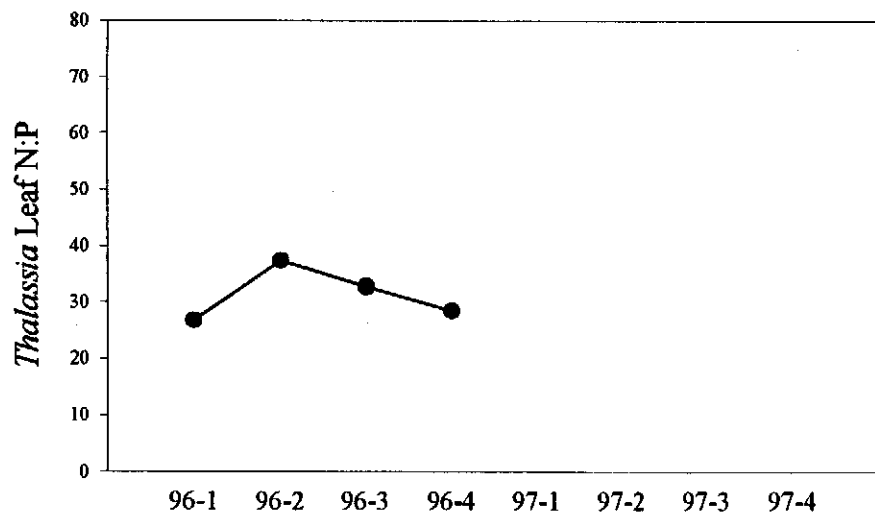
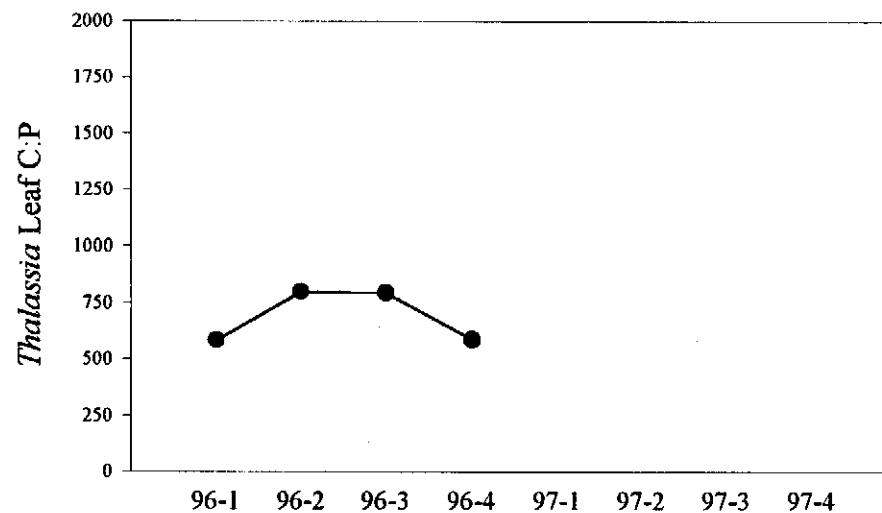
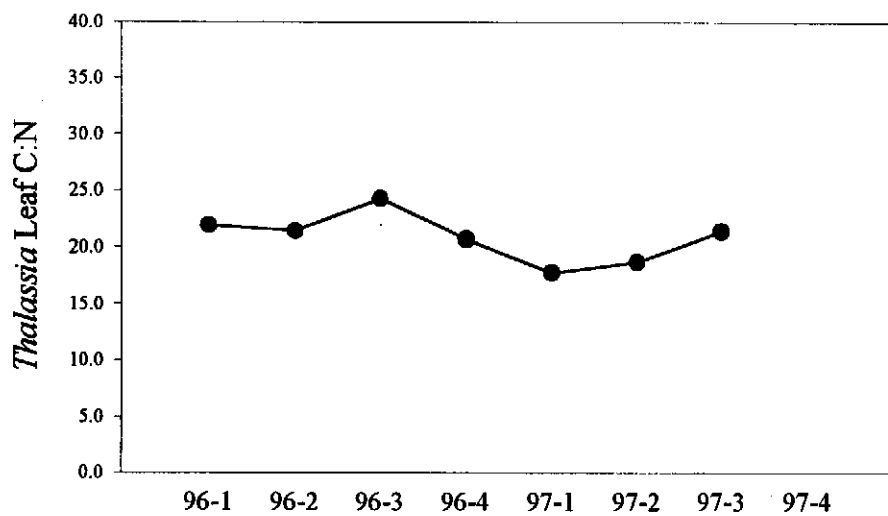


Figure 26d. Site 294. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 26e. Site 294. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

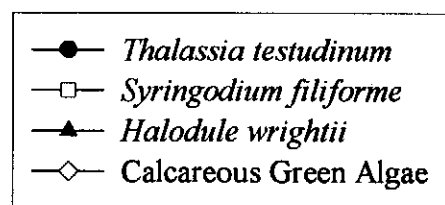
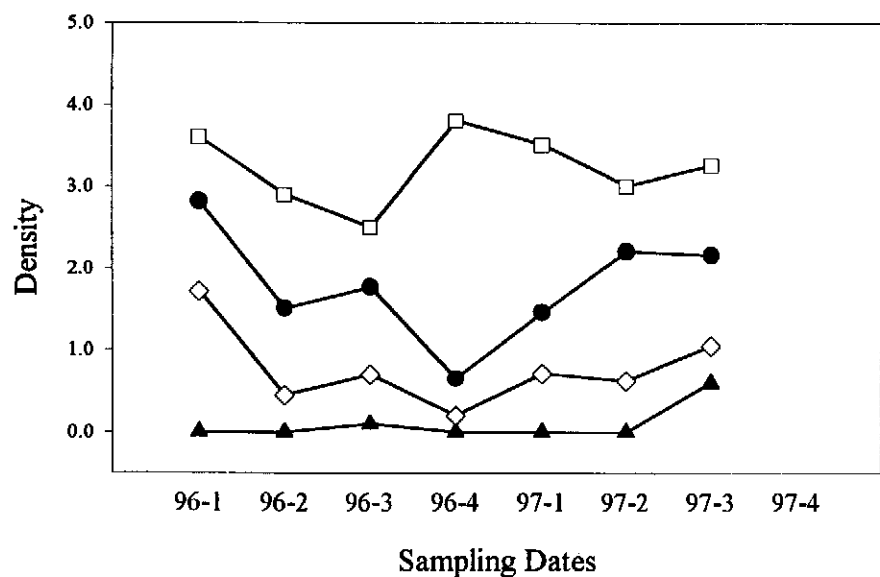
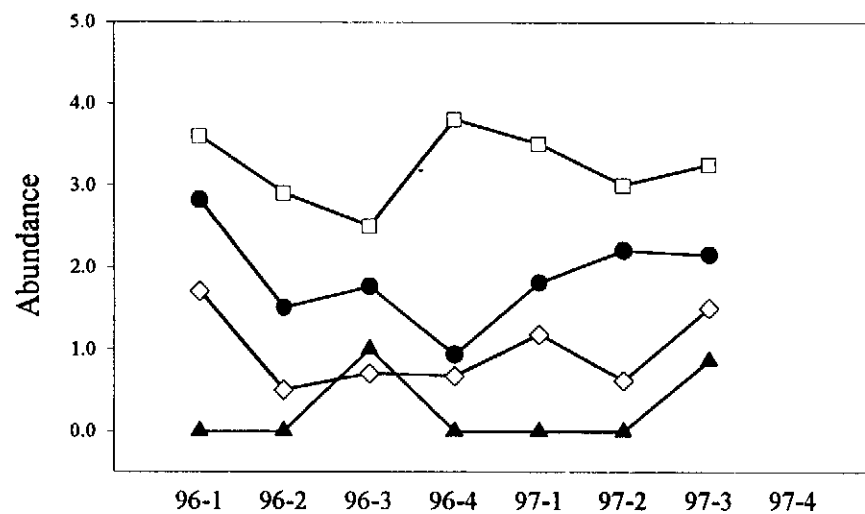
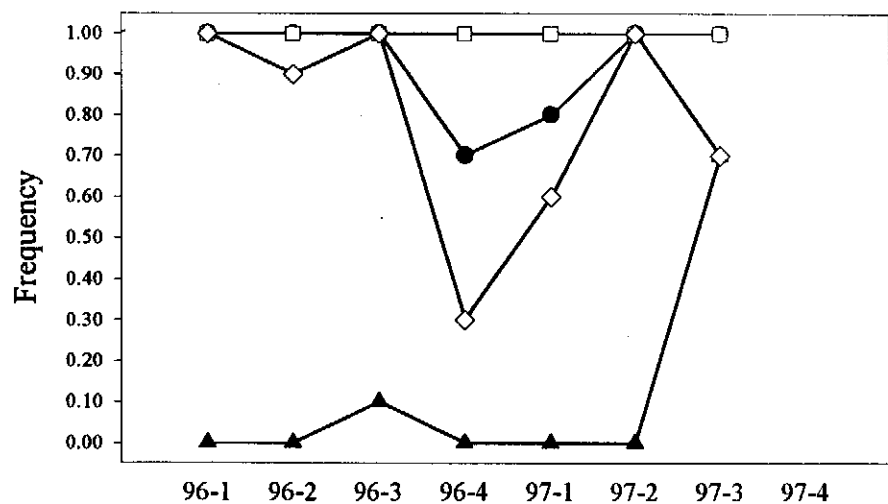
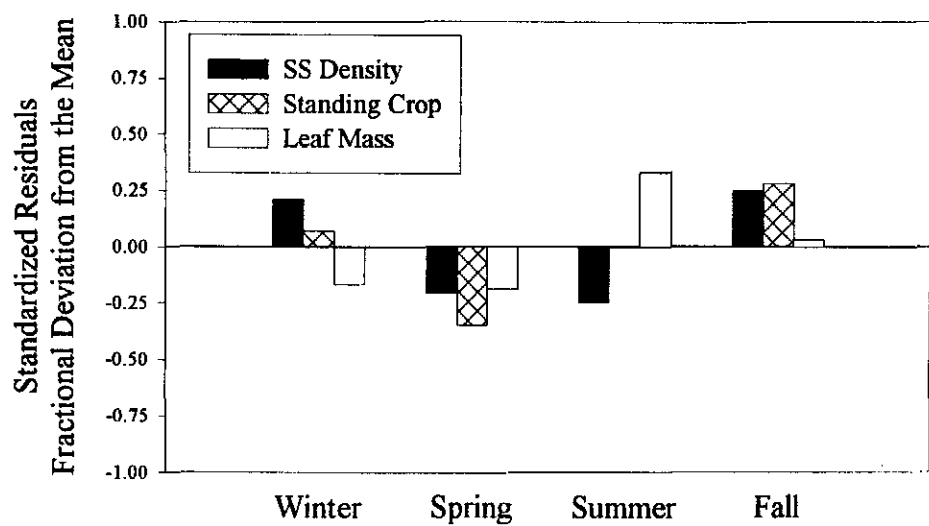
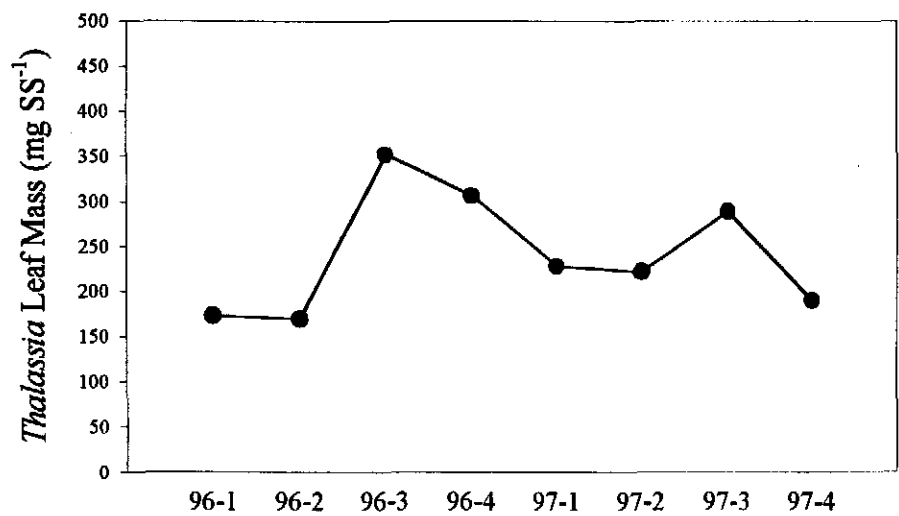
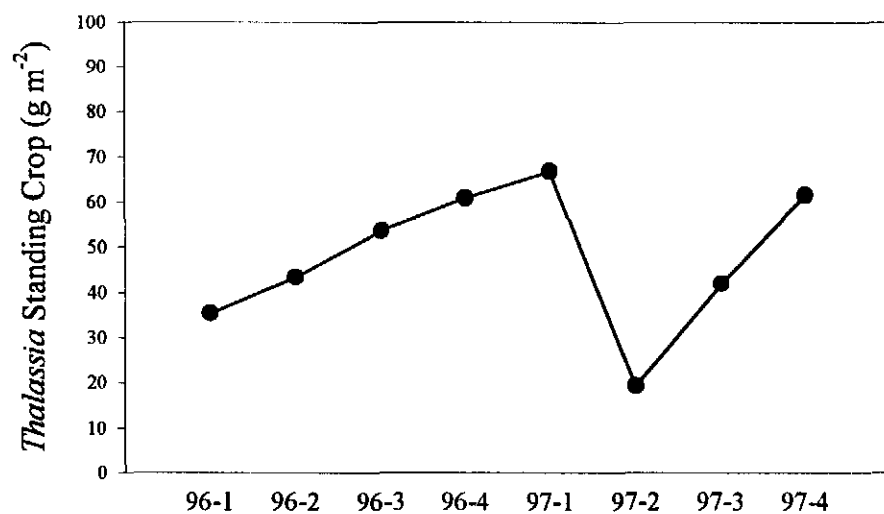
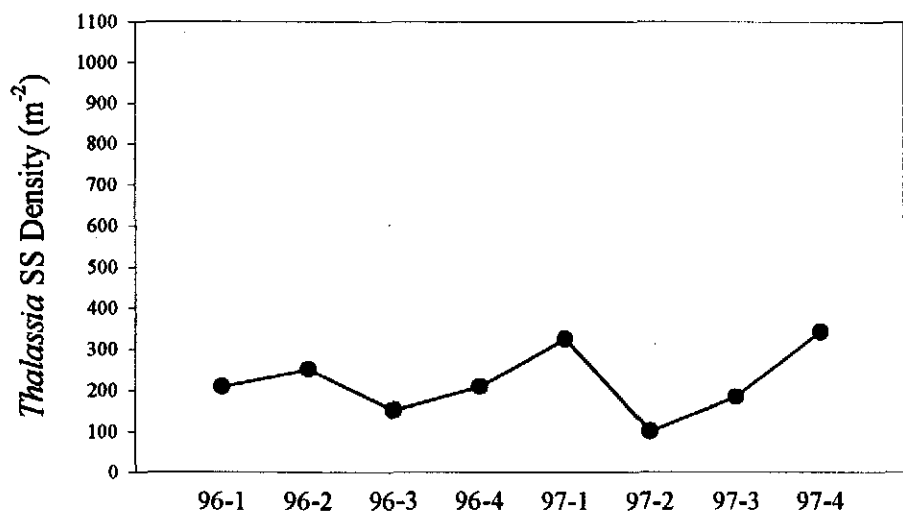


Figure 27a. Site 296. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 27b. Site 296. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

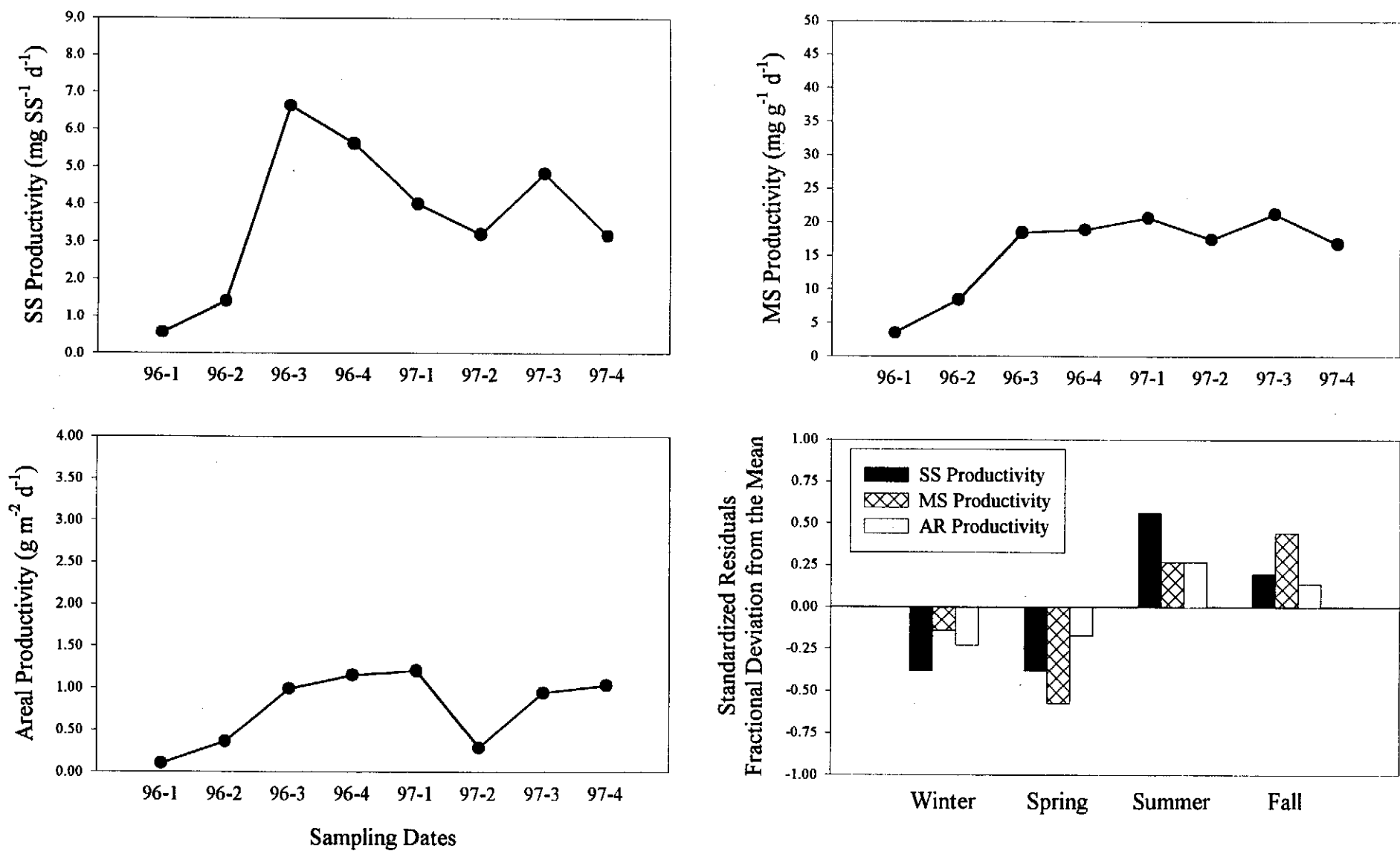


Figure 27c. Site 296. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

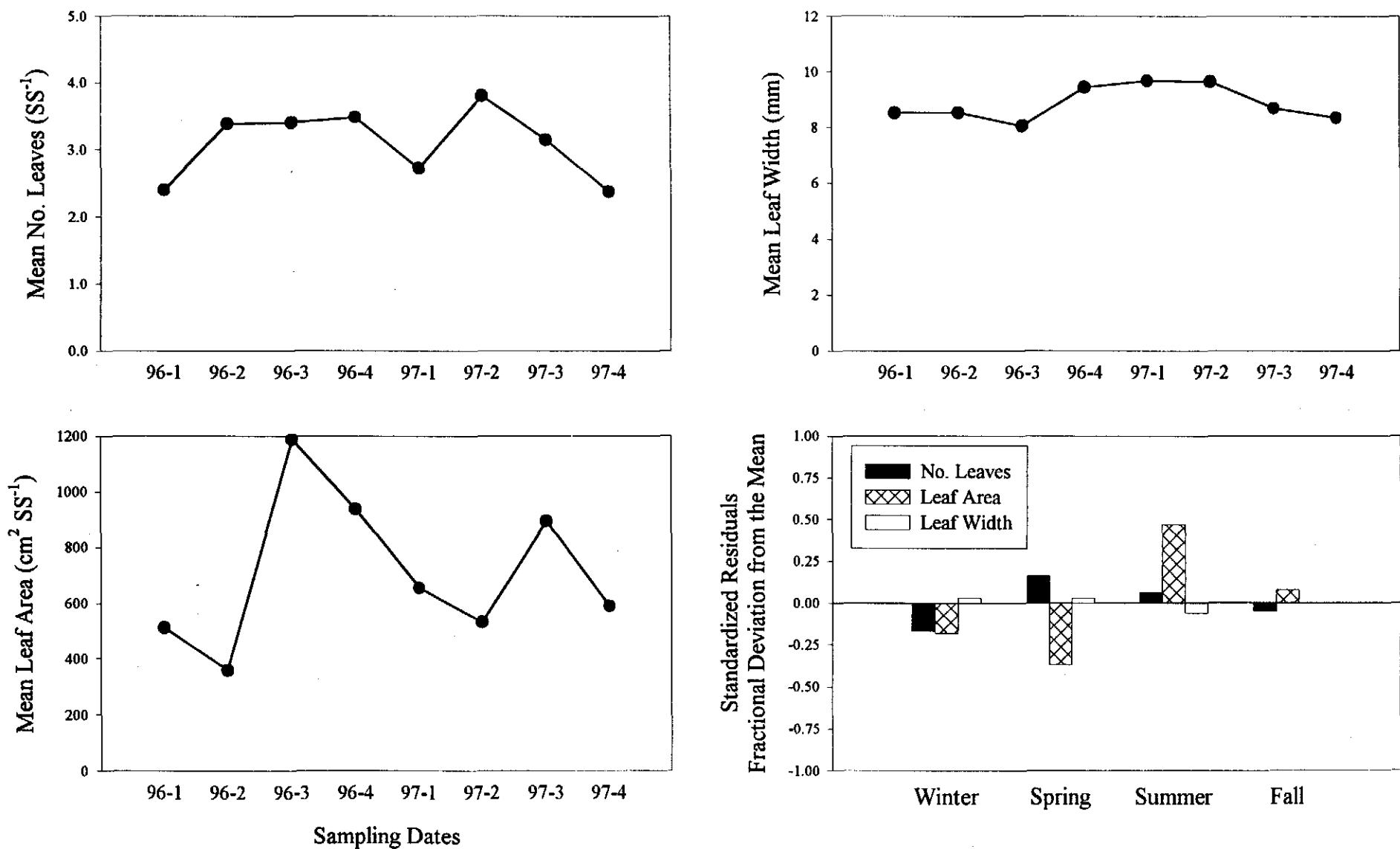


Figure 27d. Site 296. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

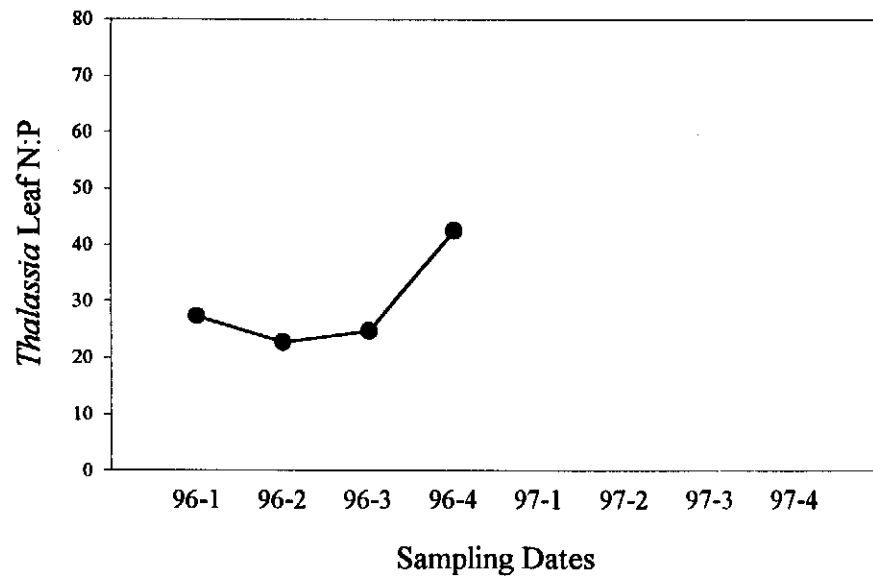
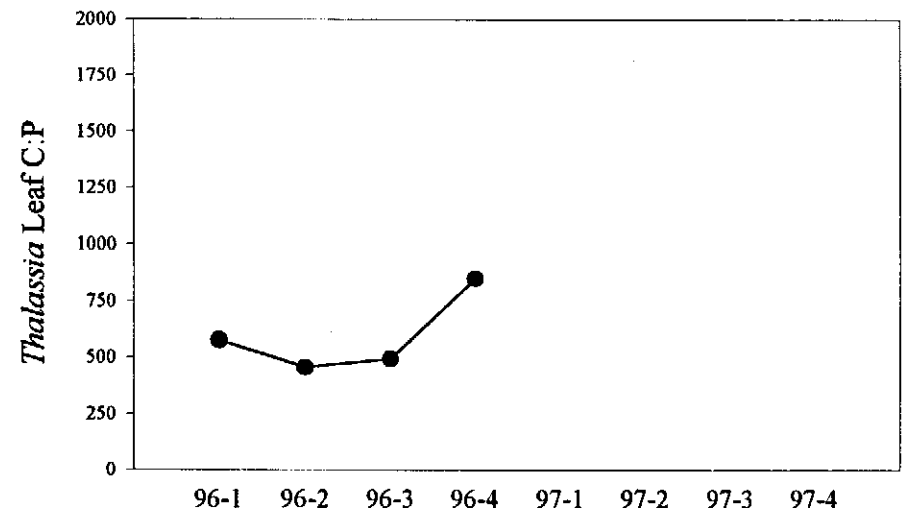
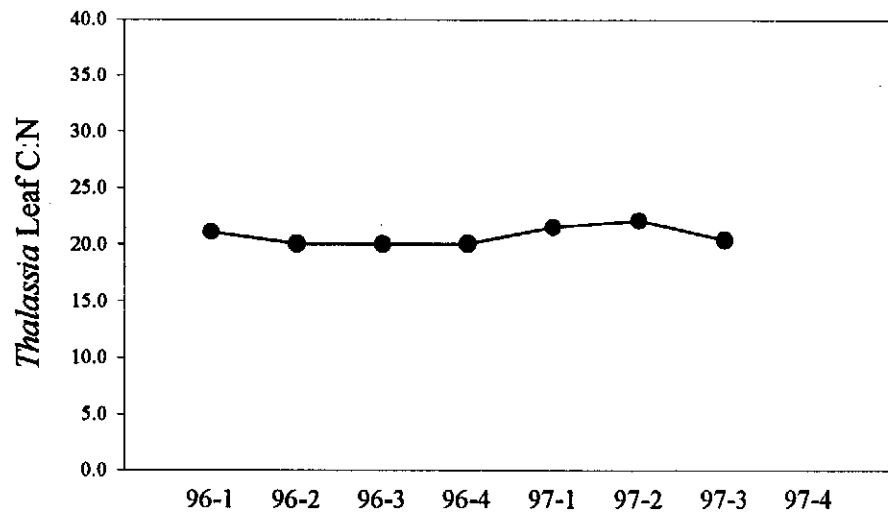


Figure 27e. Site 296. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

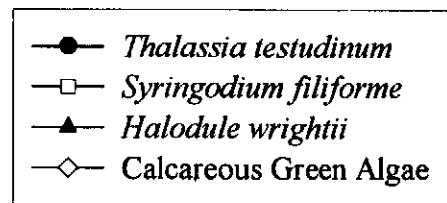
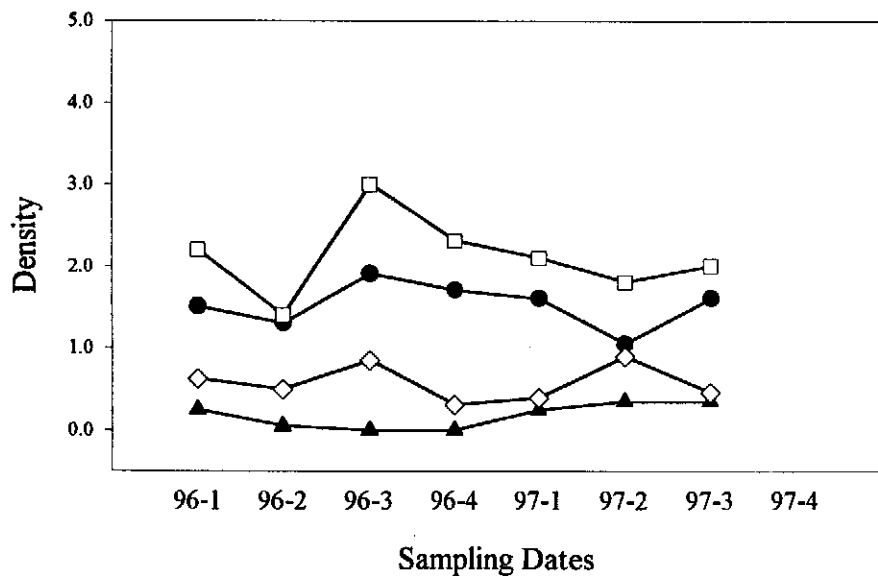
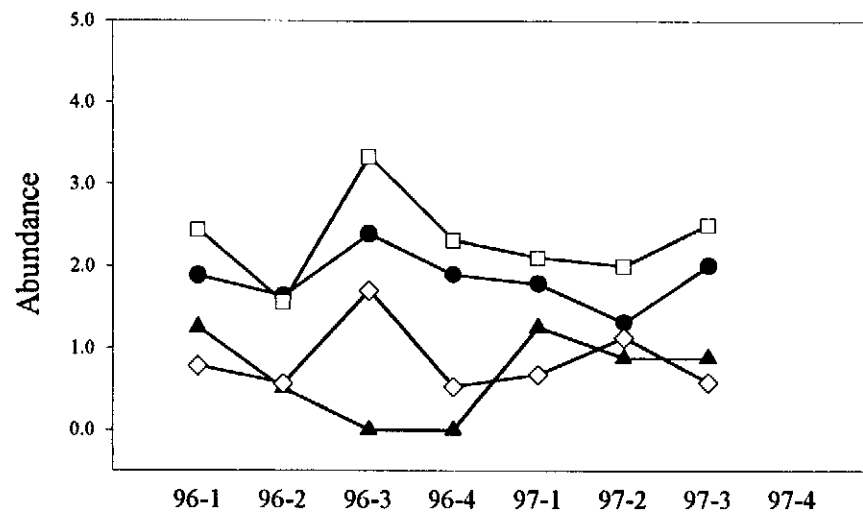
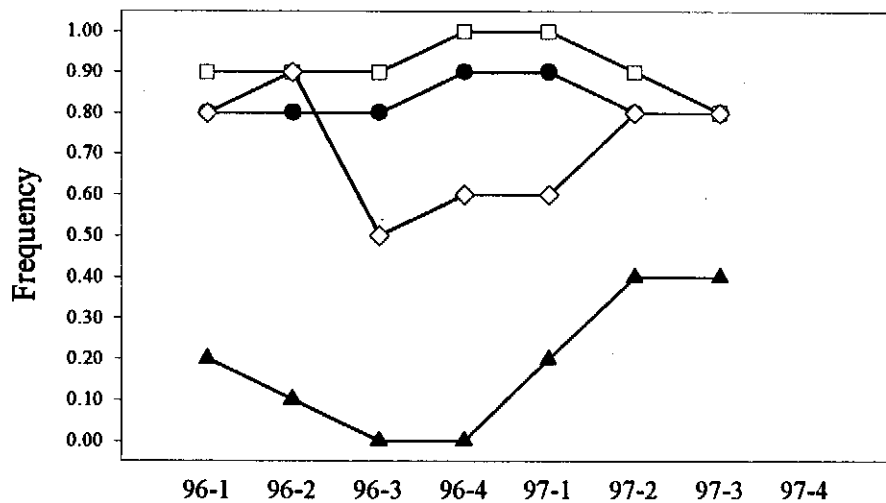
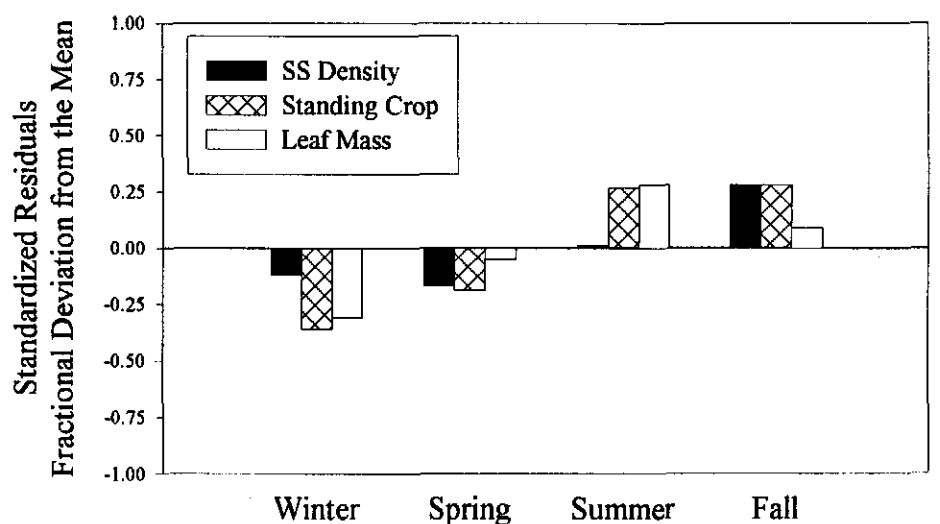
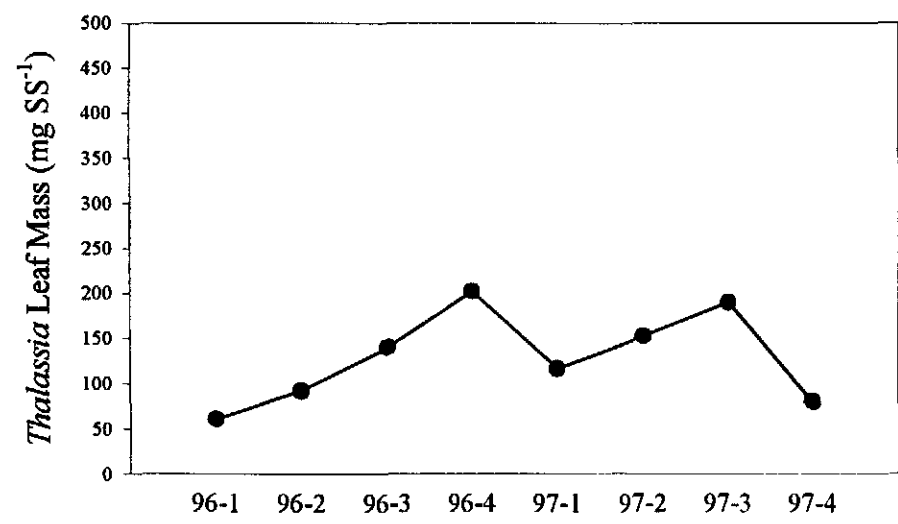
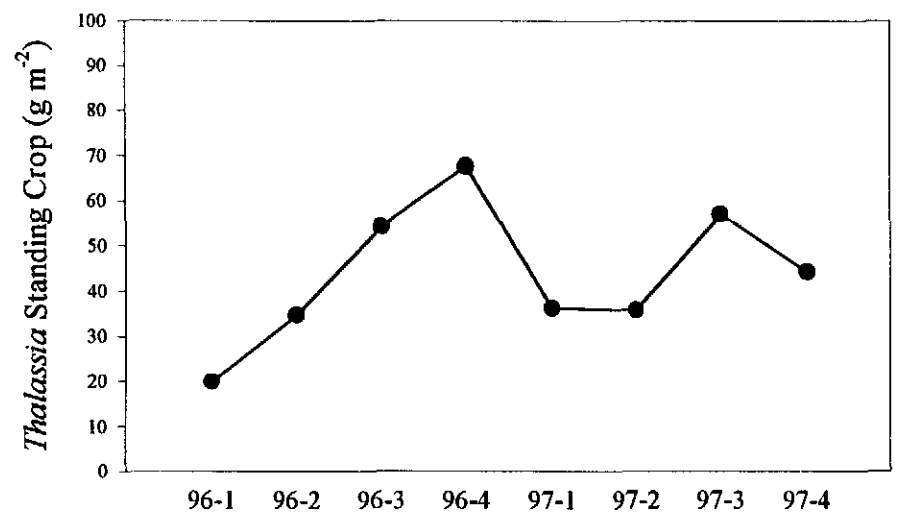
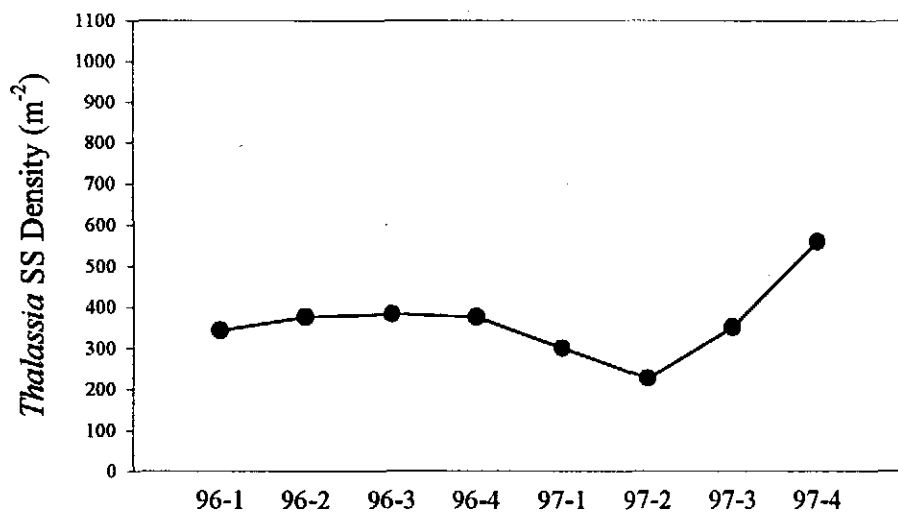
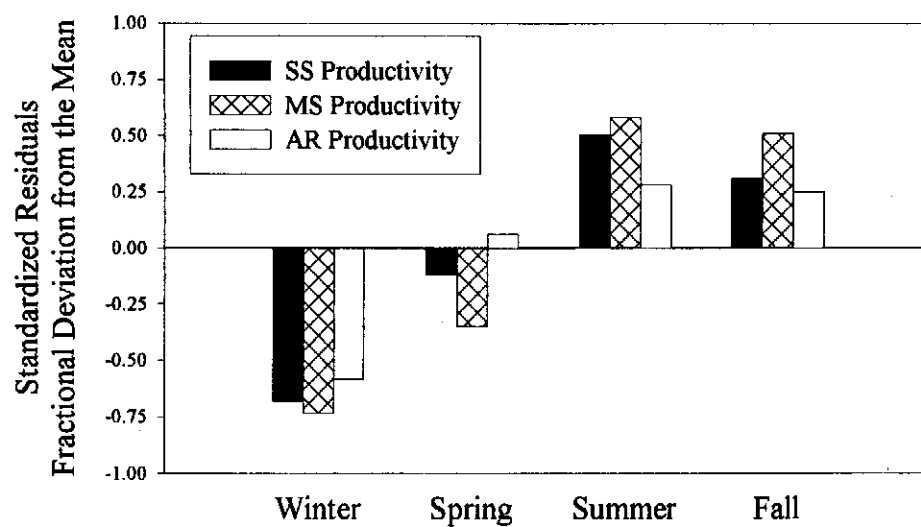
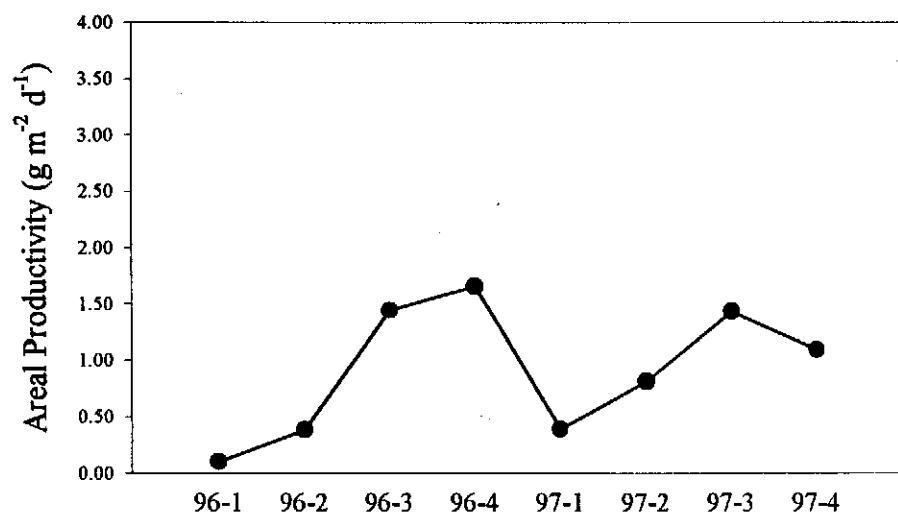
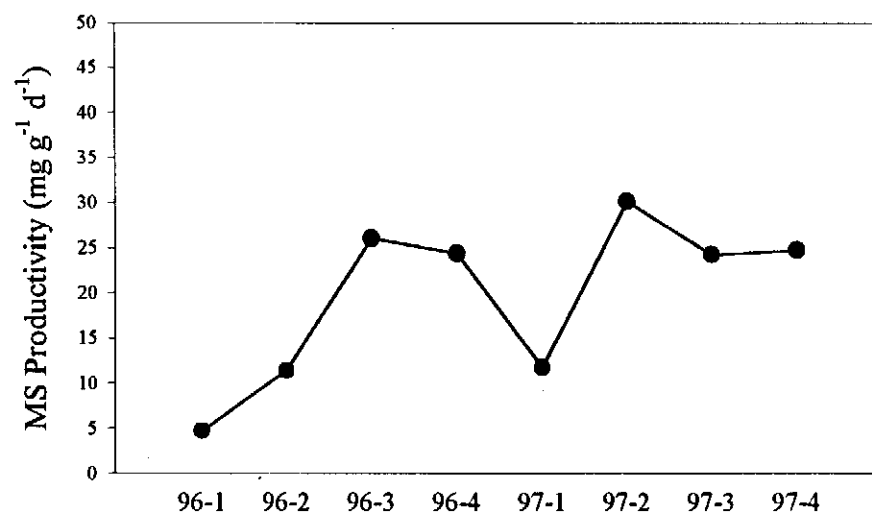
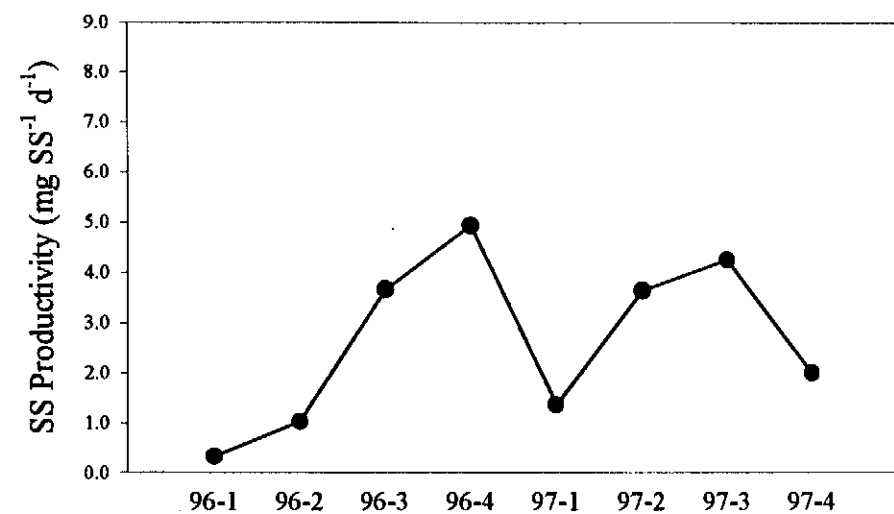


Figure 28a. Site 305. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 28b. Site 305. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 28c. Site 305. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

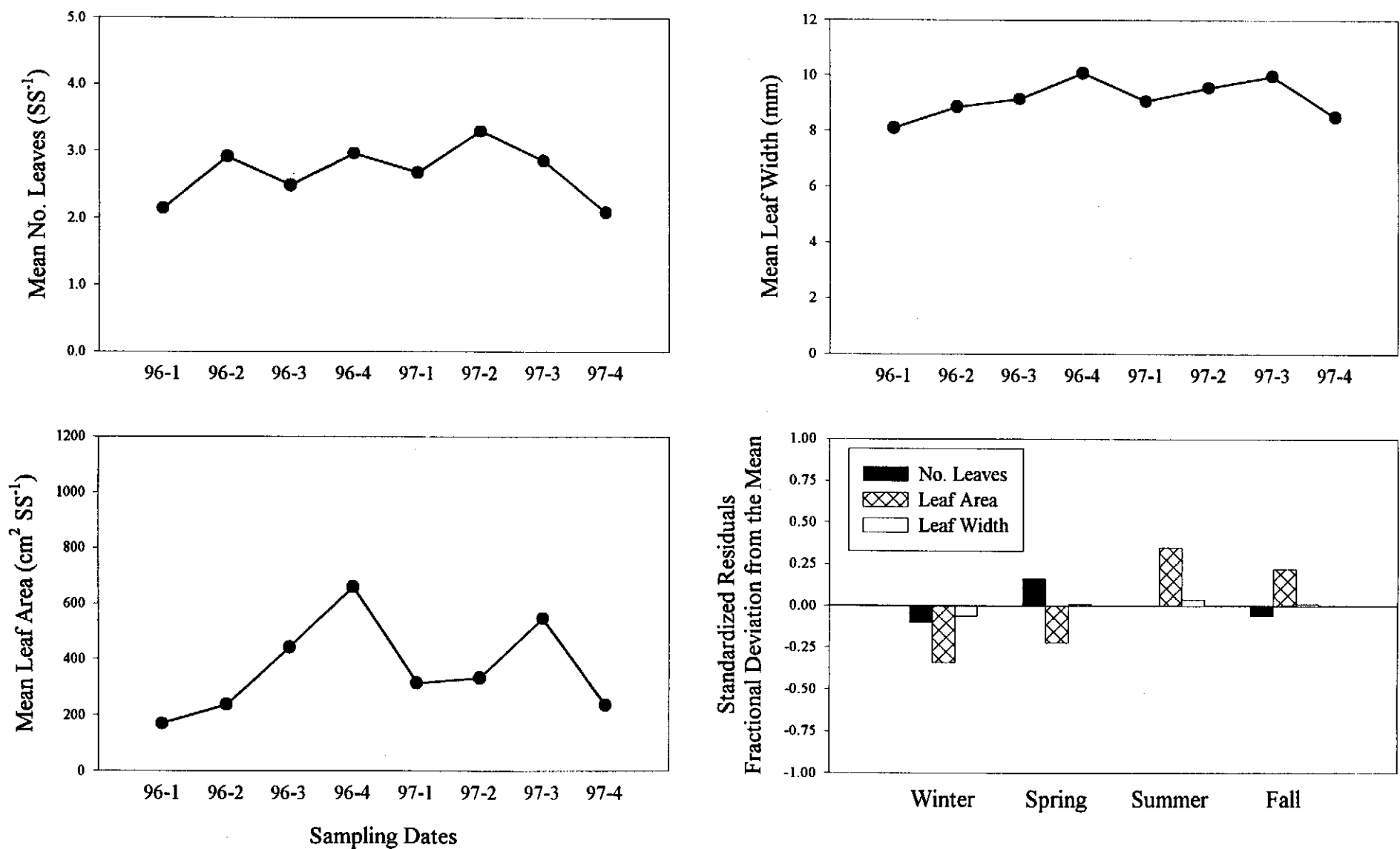
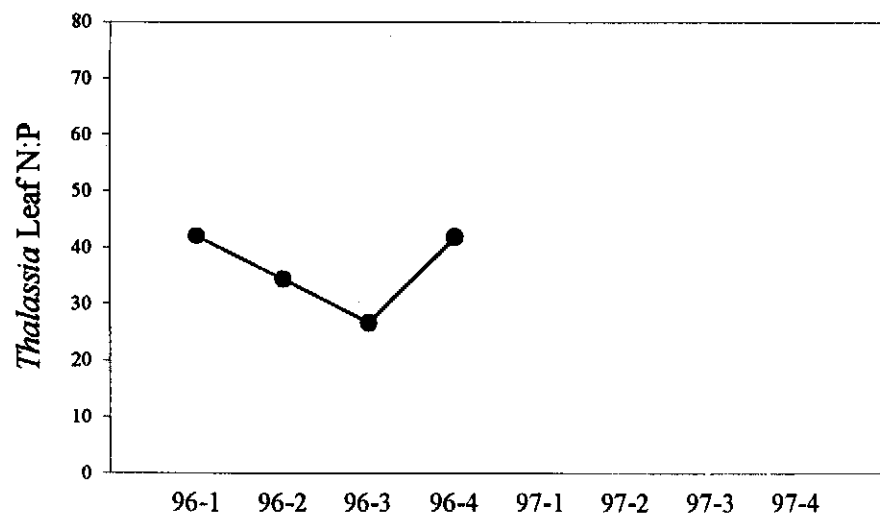
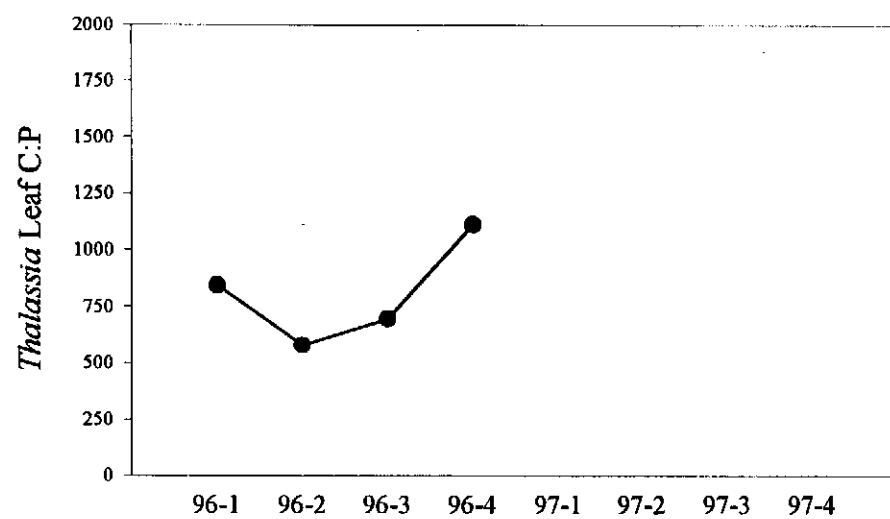
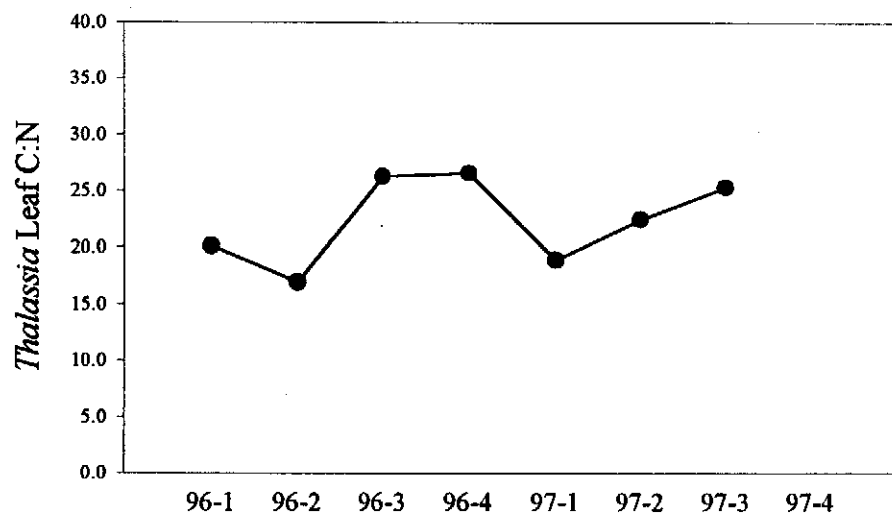
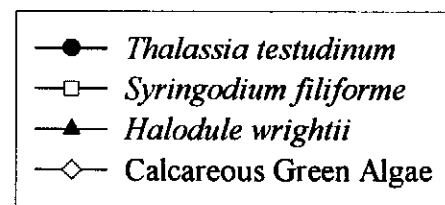
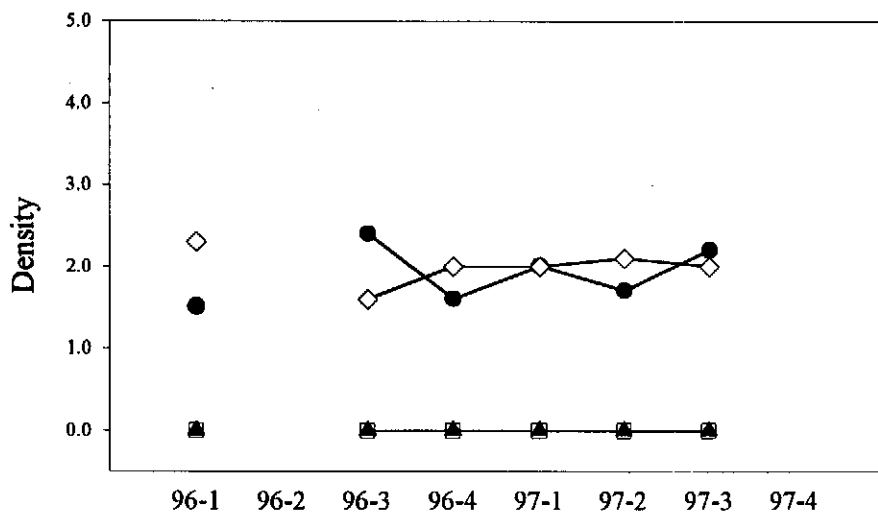
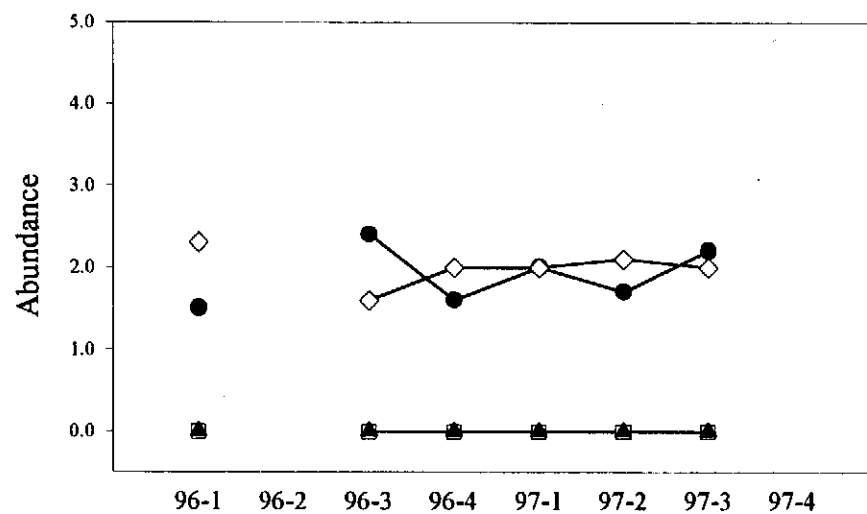
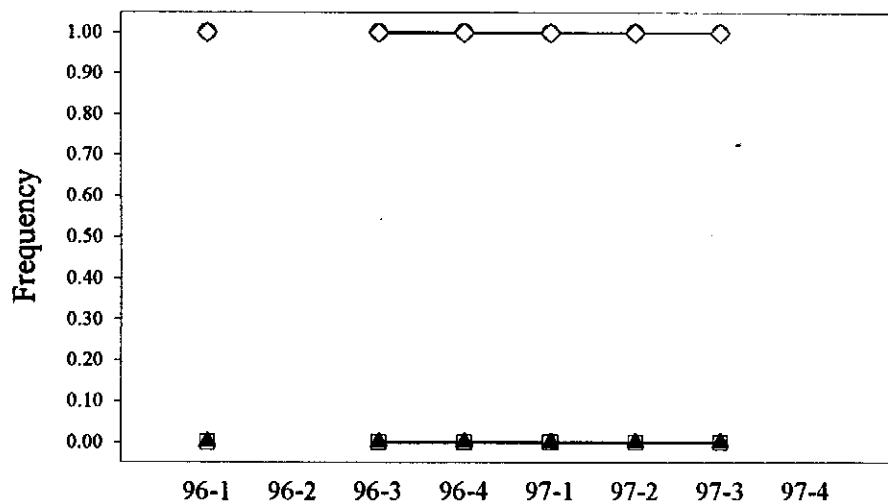


Figure 28d. Site 305. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



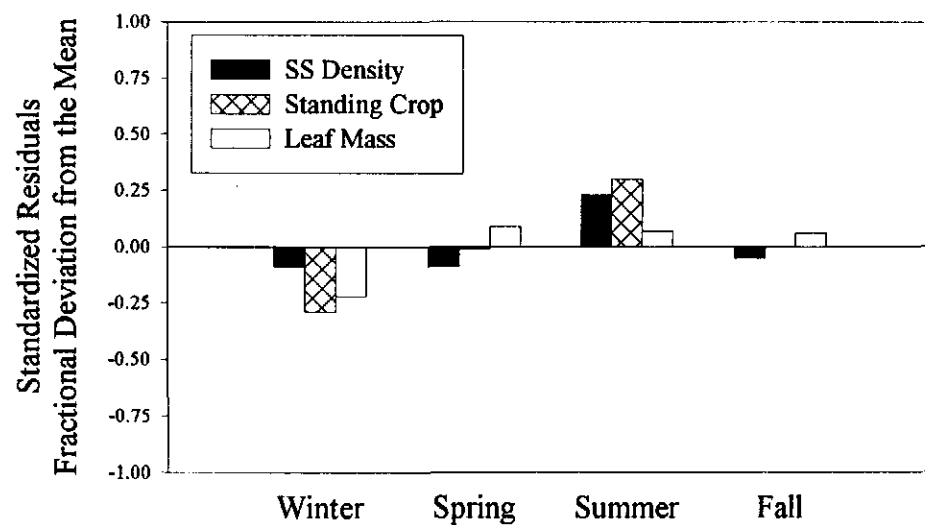
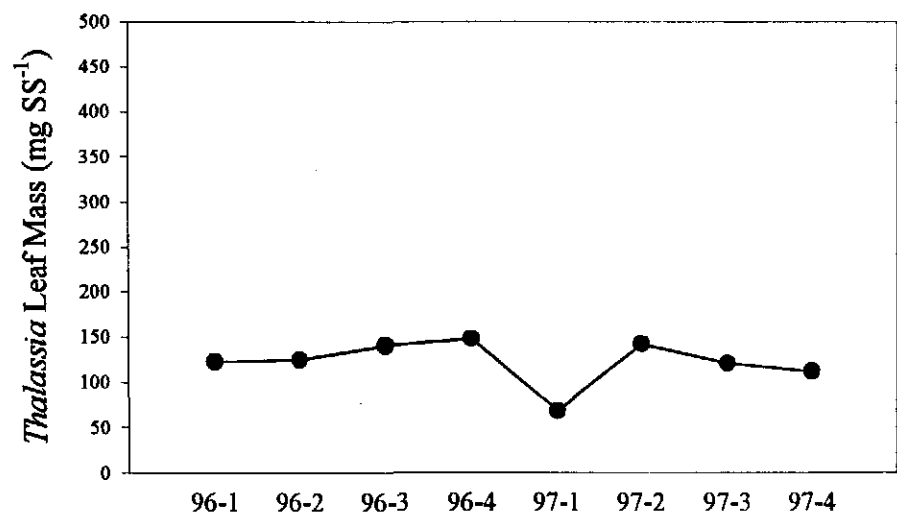
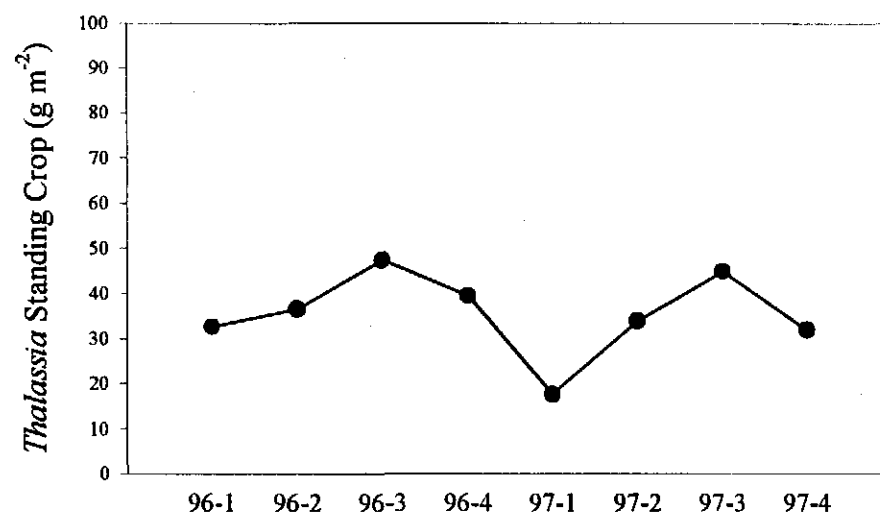
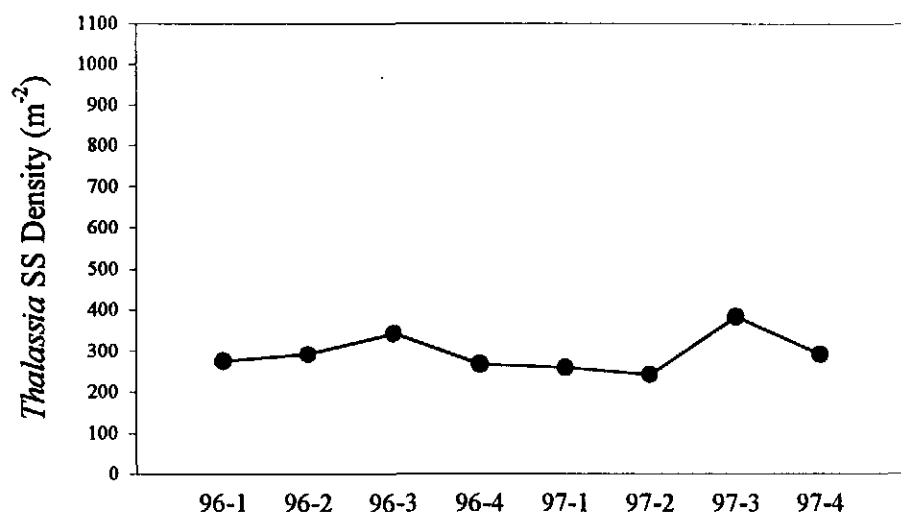
Sampling Dates

Figure 28e. Site 305. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.



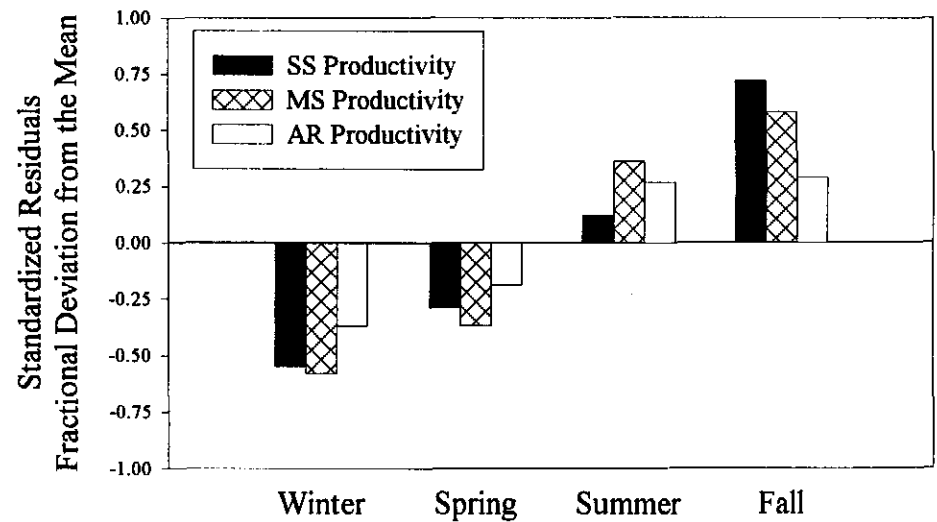
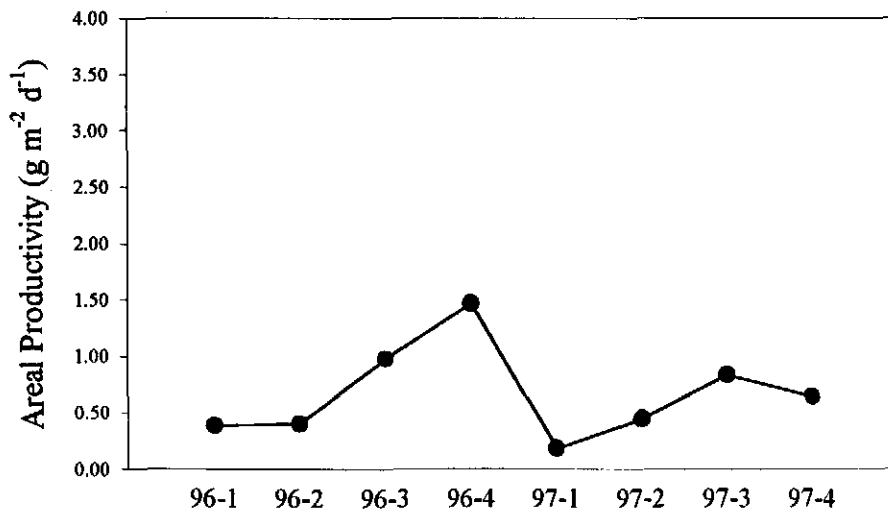
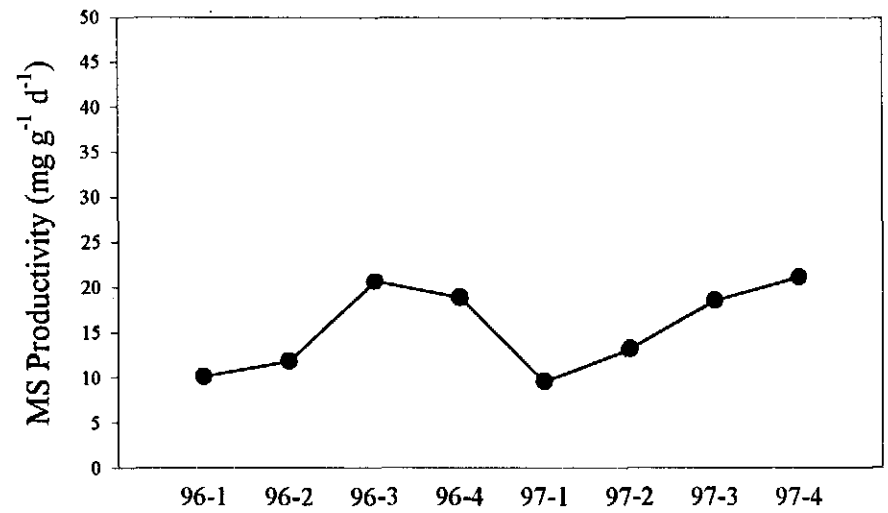
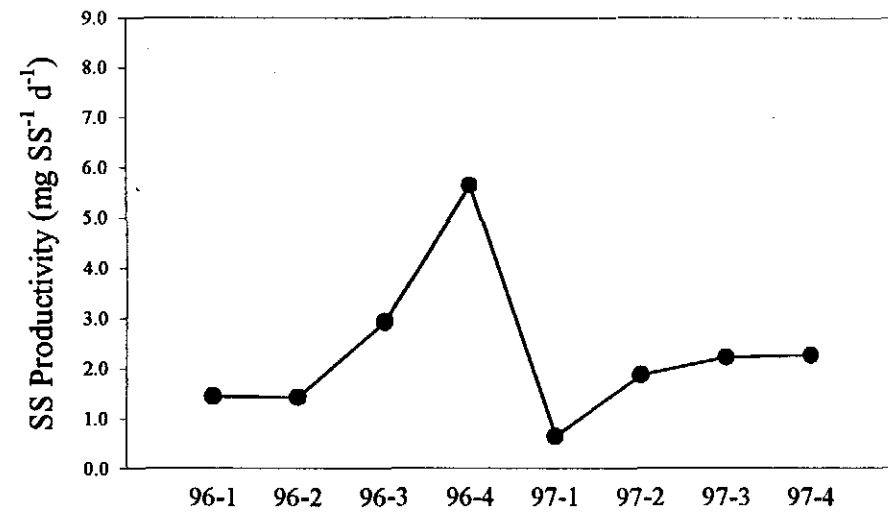
Sampling Dates

Figure 29a. Site 307. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 29b. Site 307. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 29c. Site 307. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

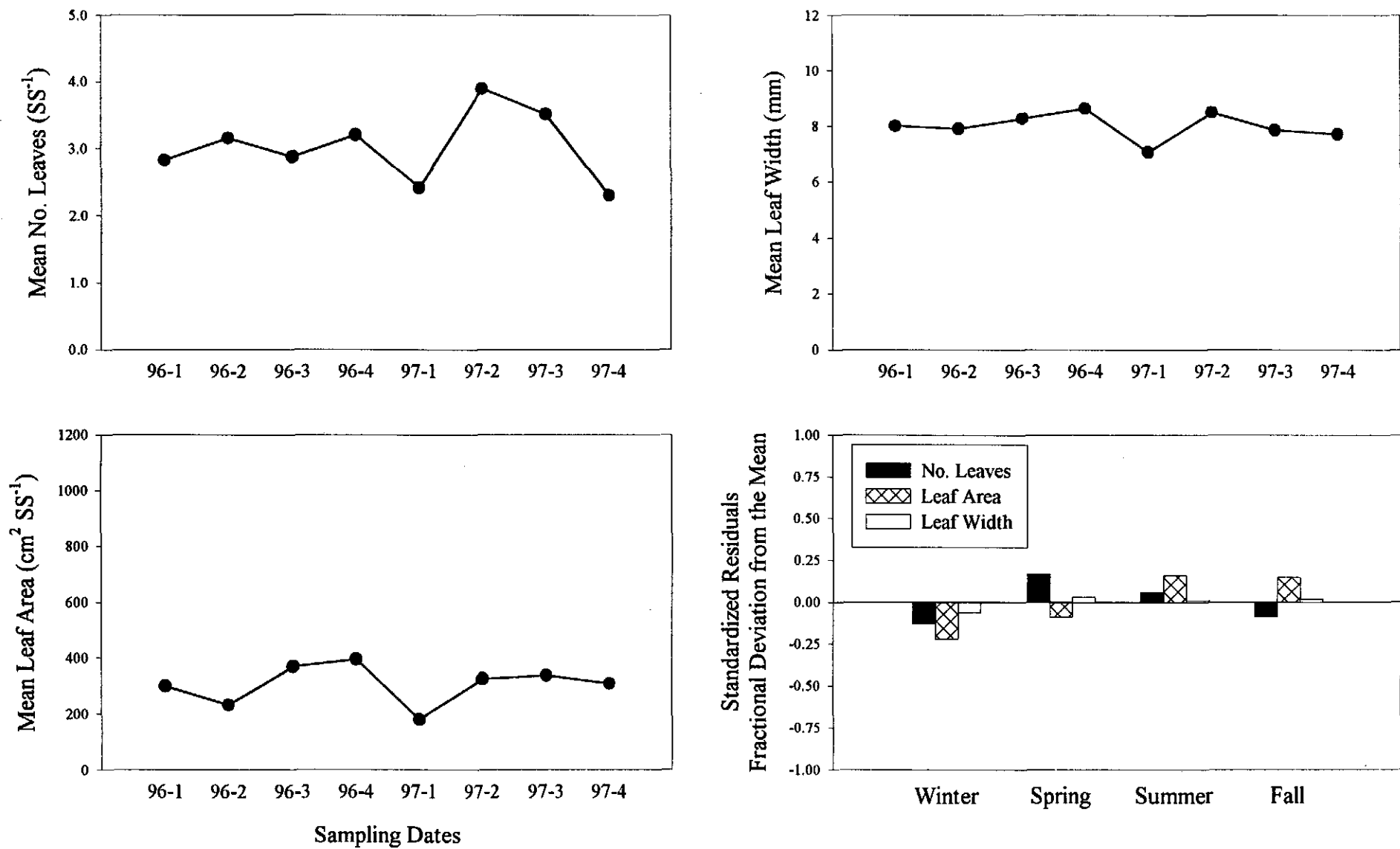
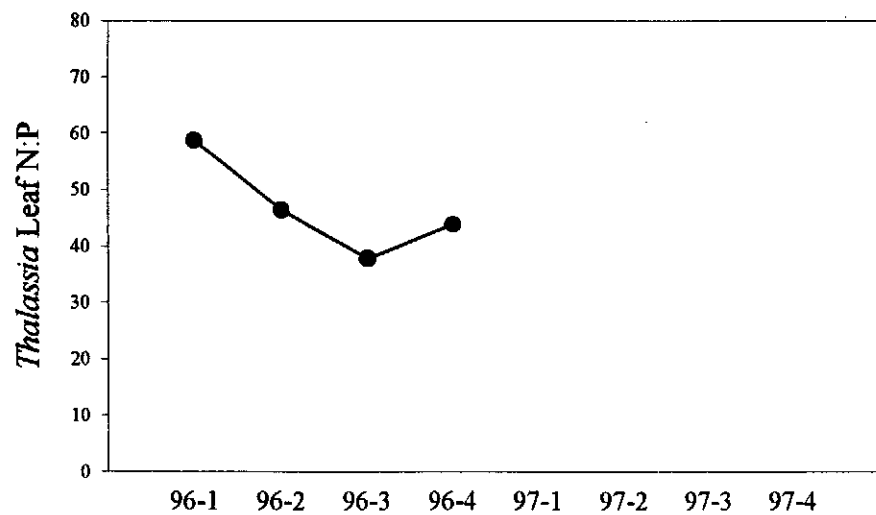
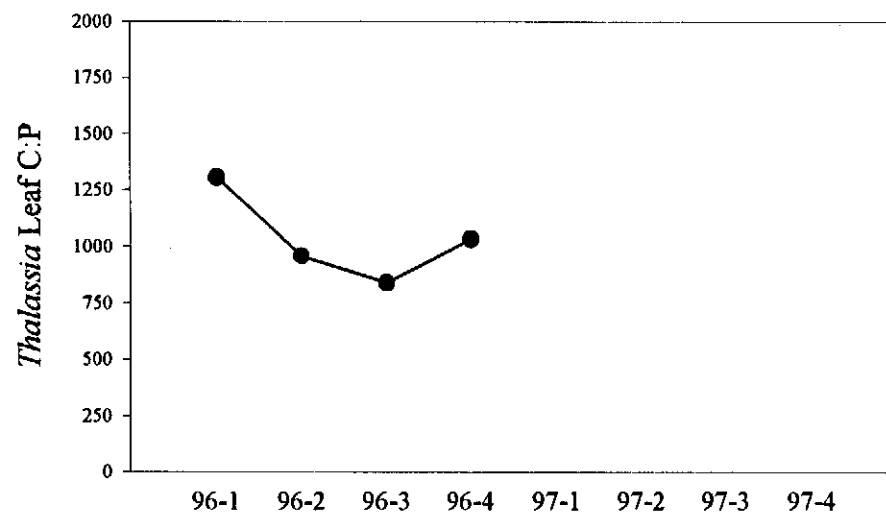
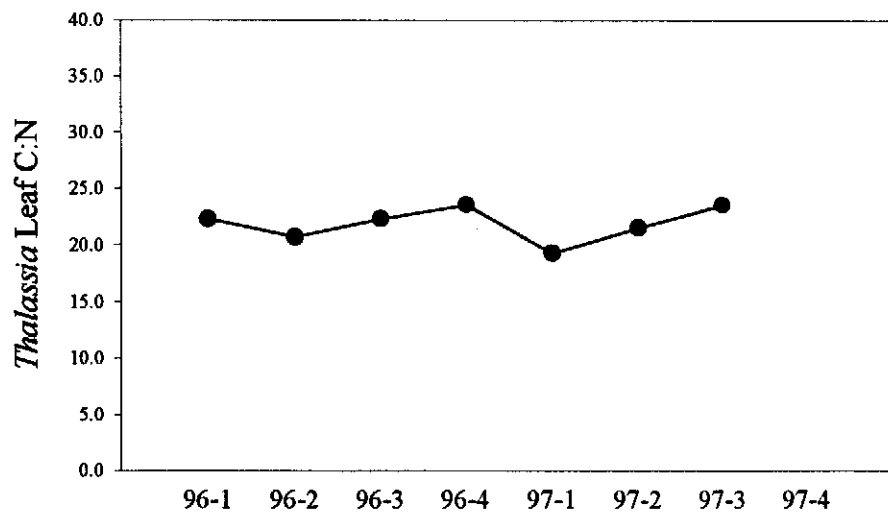


Figure 29d. Site 307. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 29e. Site 307. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

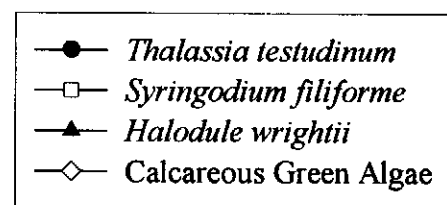
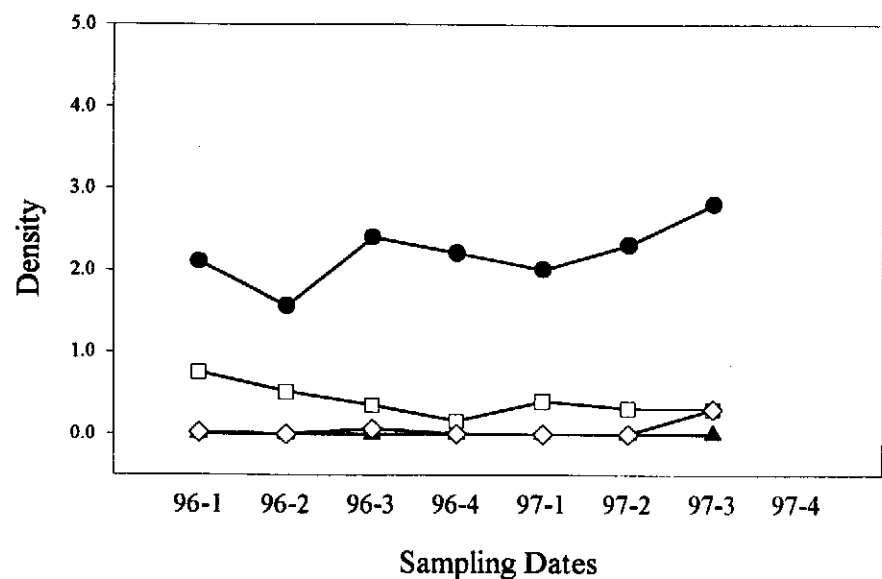
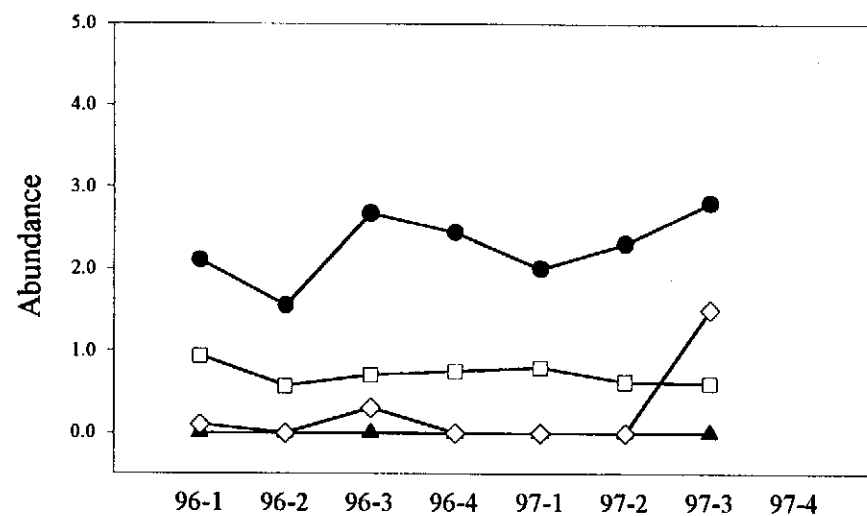
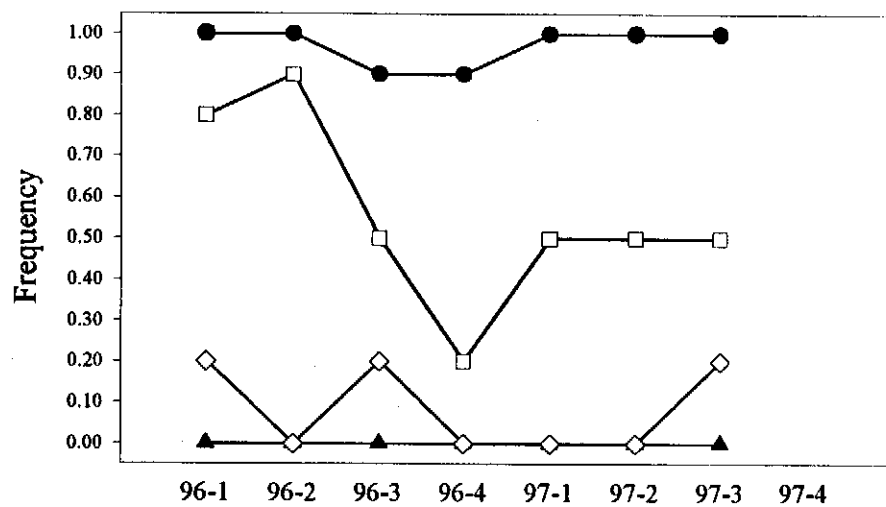


Figure 30a. Site 309. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.

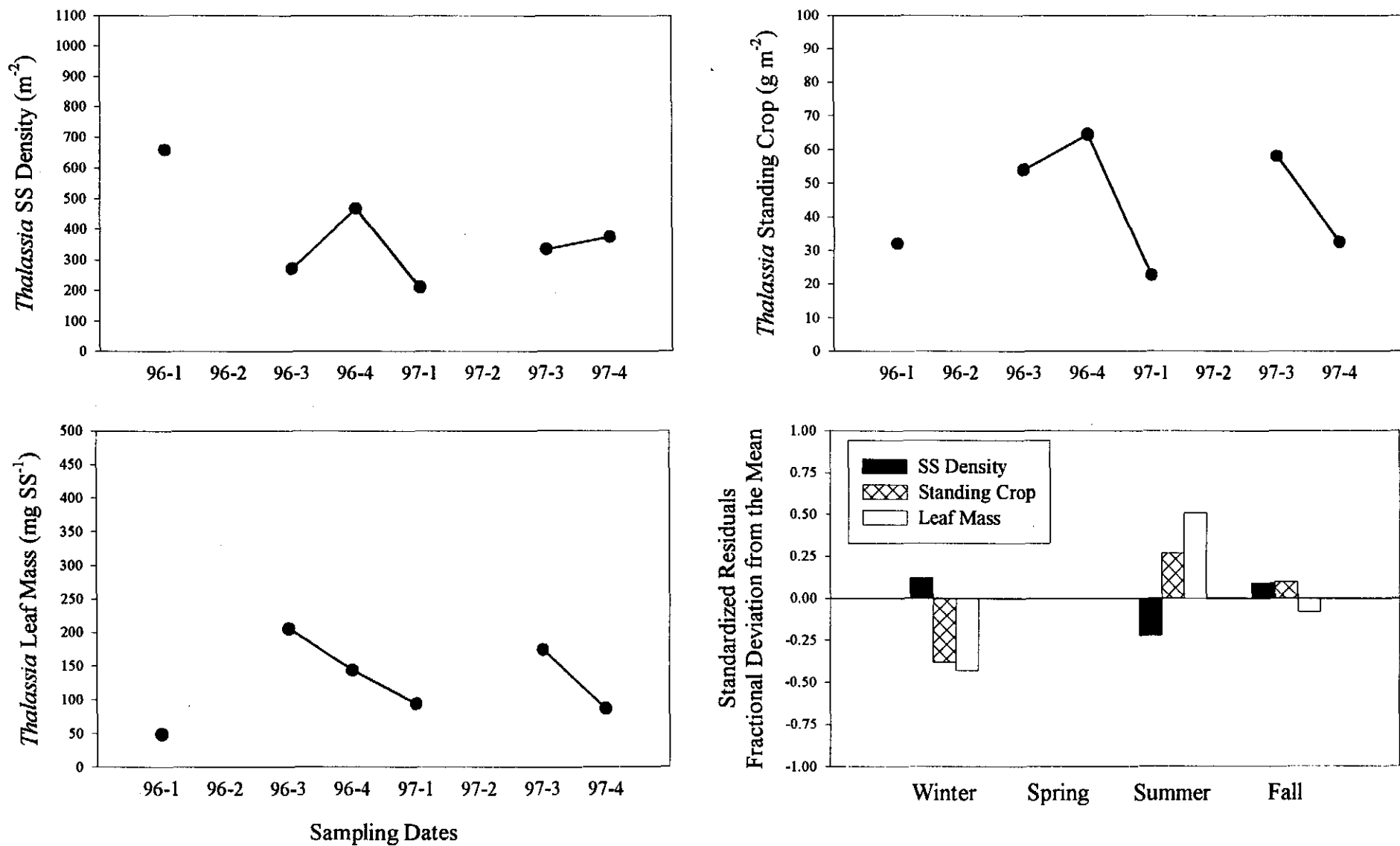


Figure 30b. Site 309. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

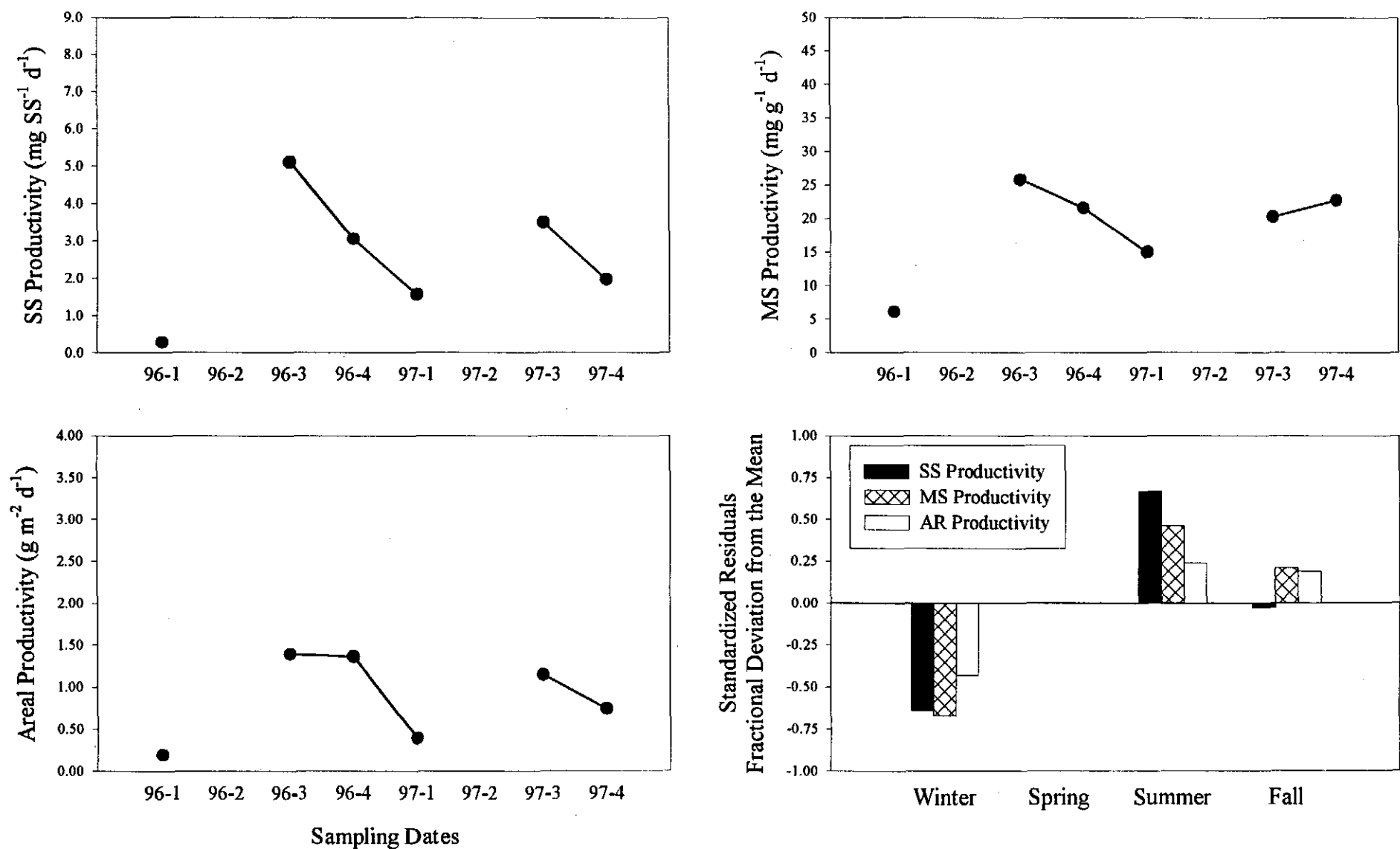


Figure 30c. Site 309. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

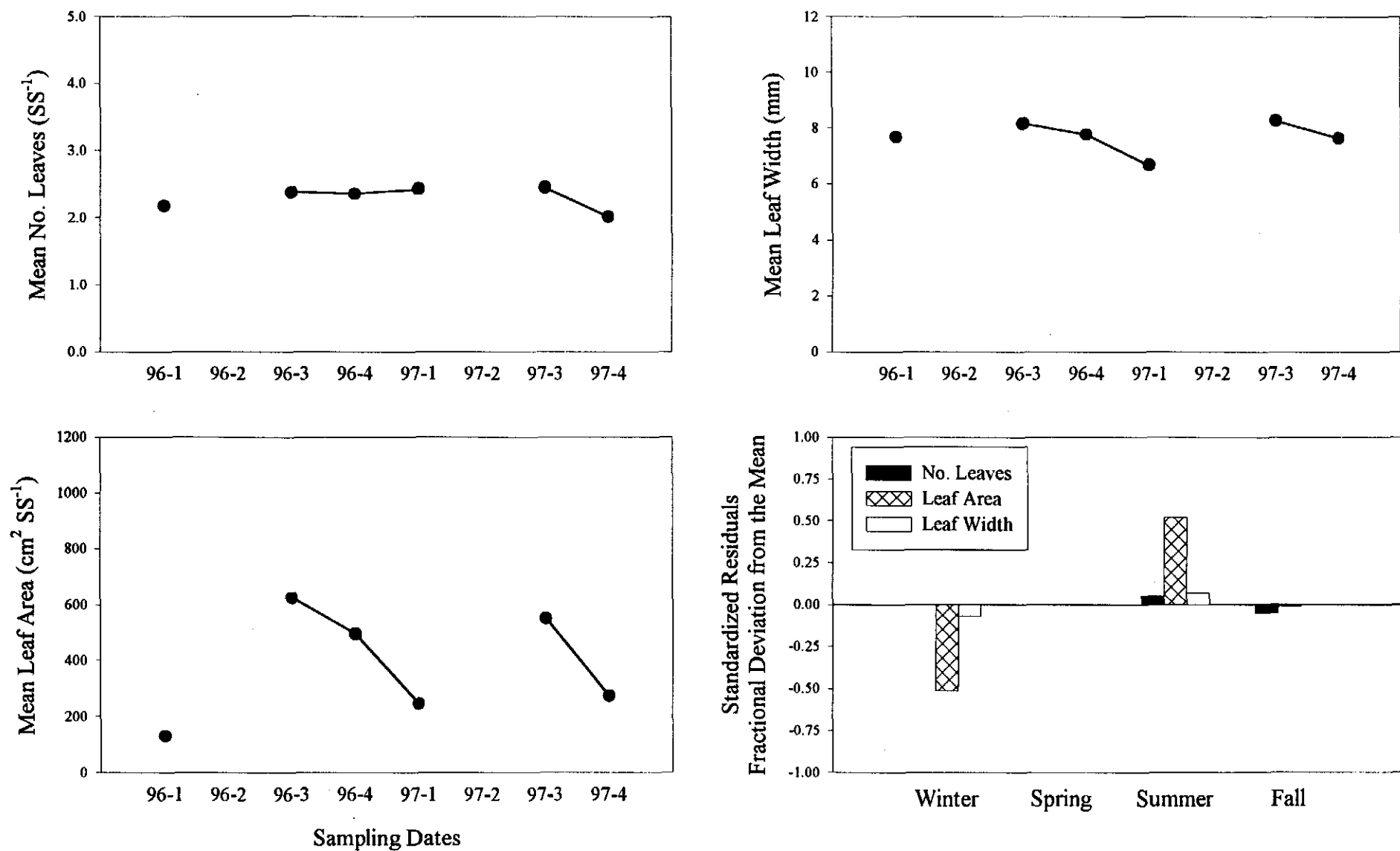


Figure 30d. Site 309. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

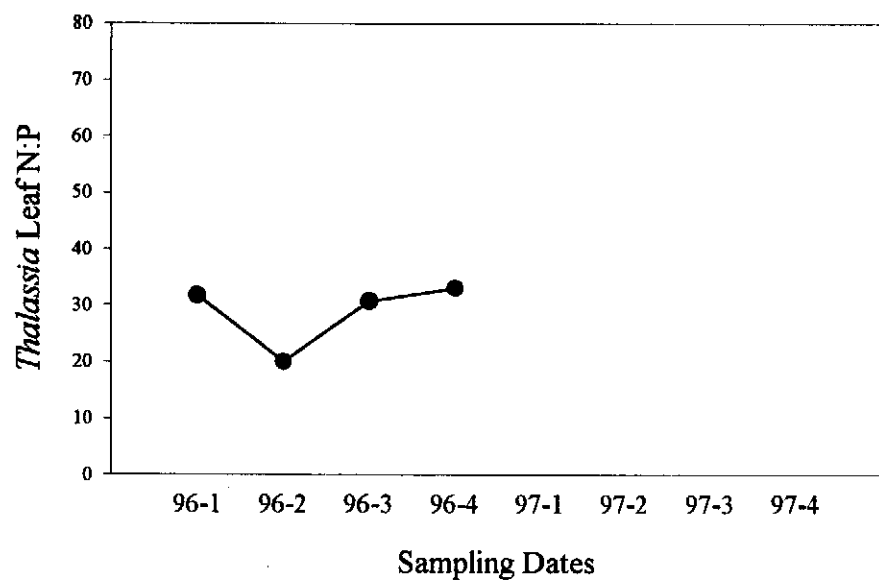
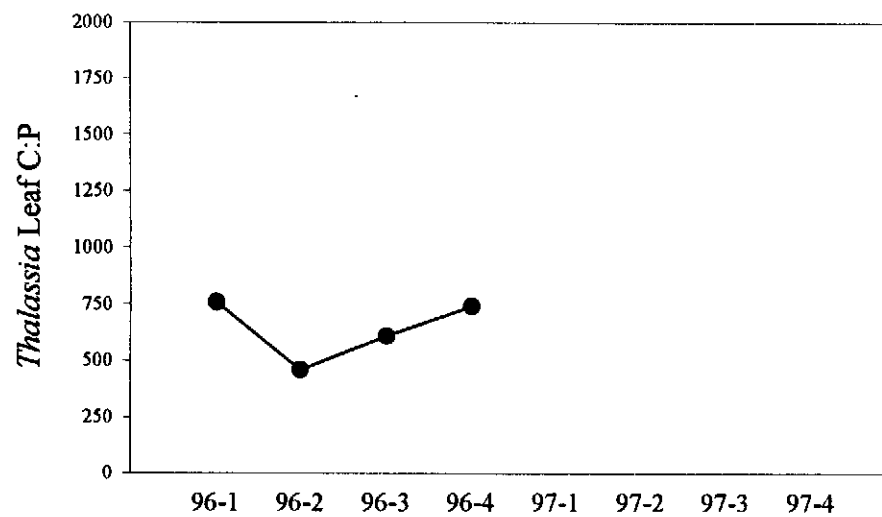
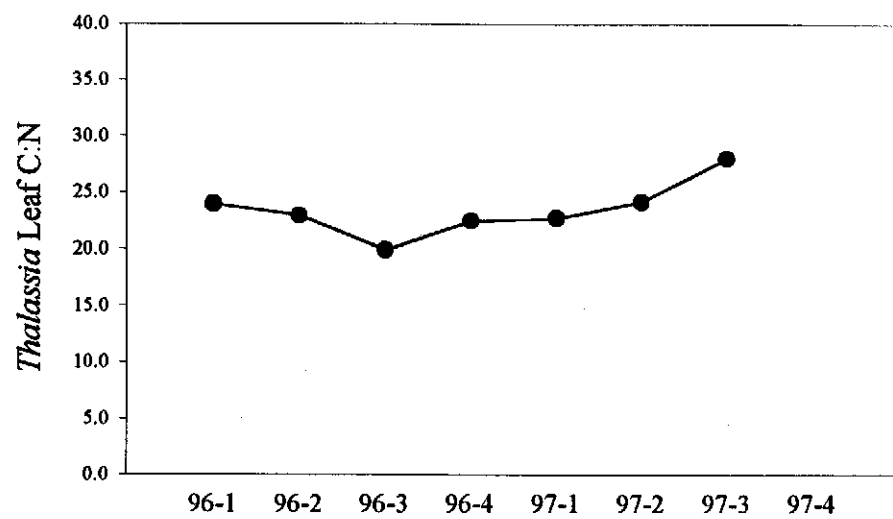


Figure 30e. Site 309. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

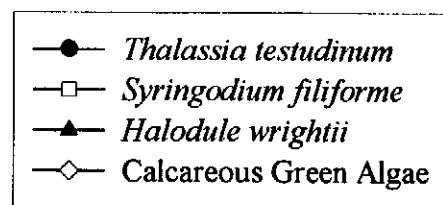
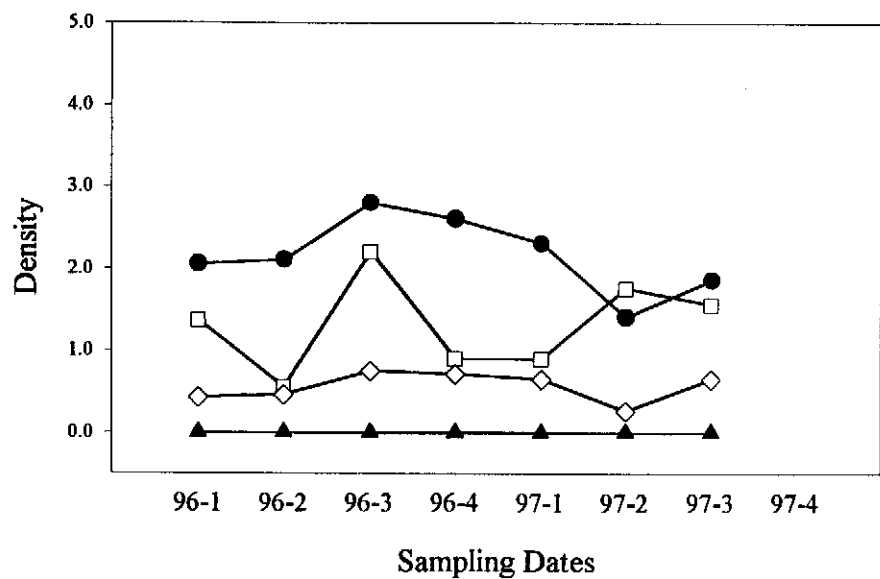
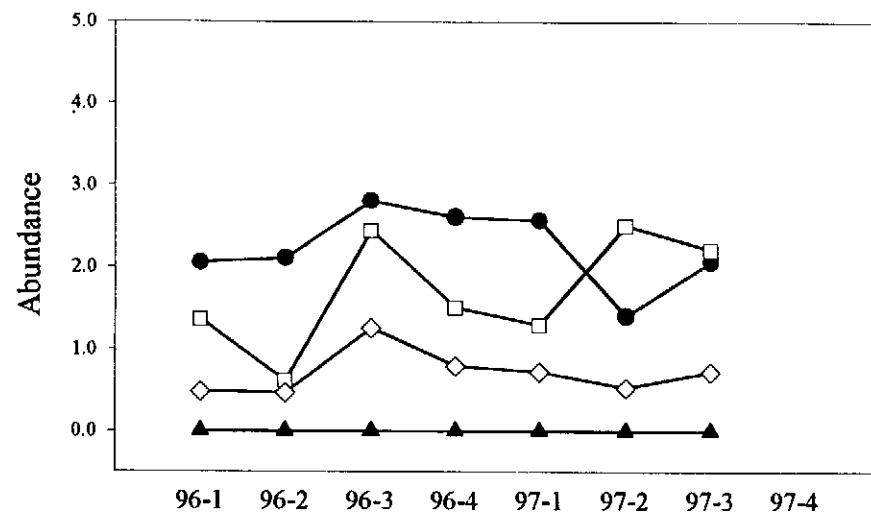
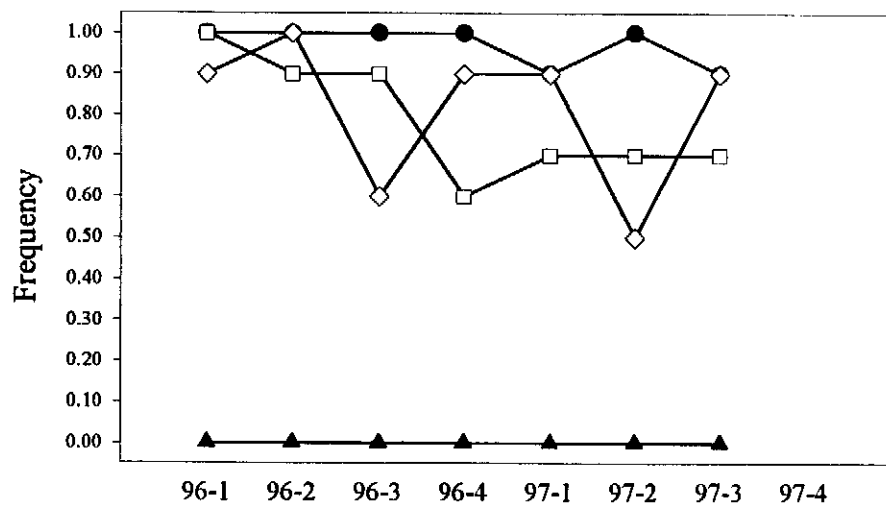
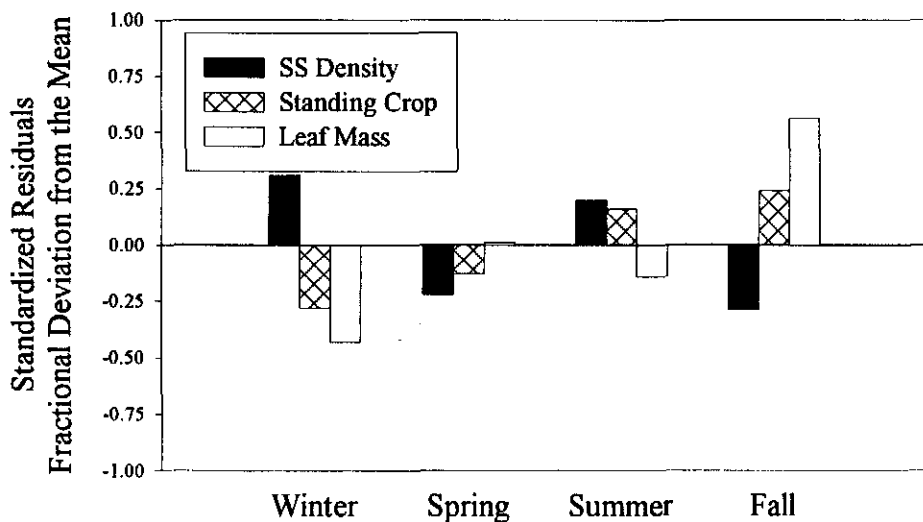
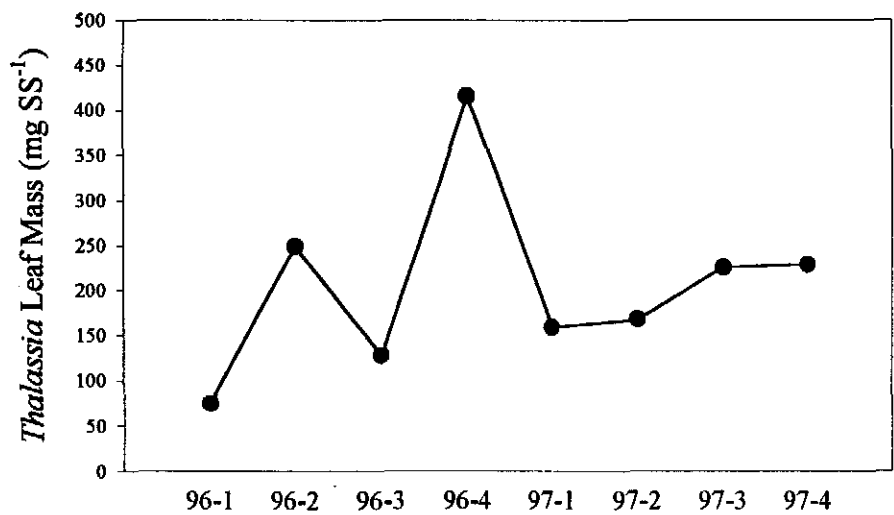
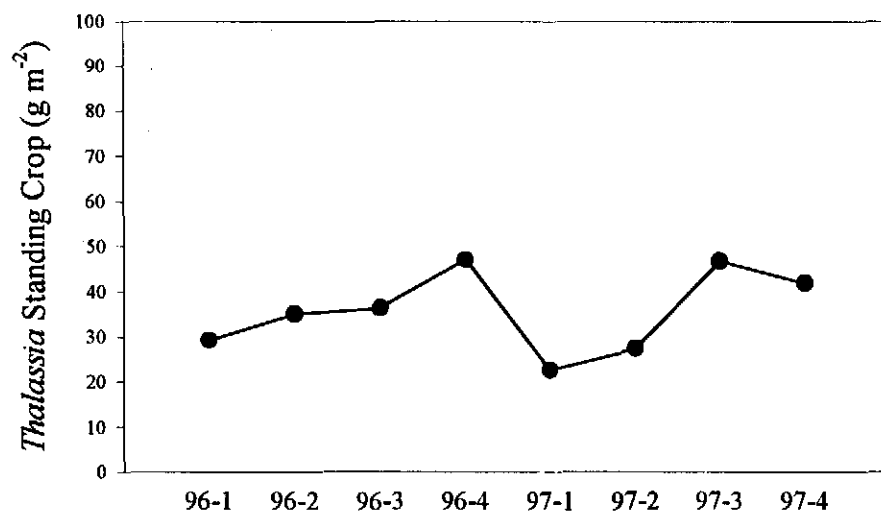
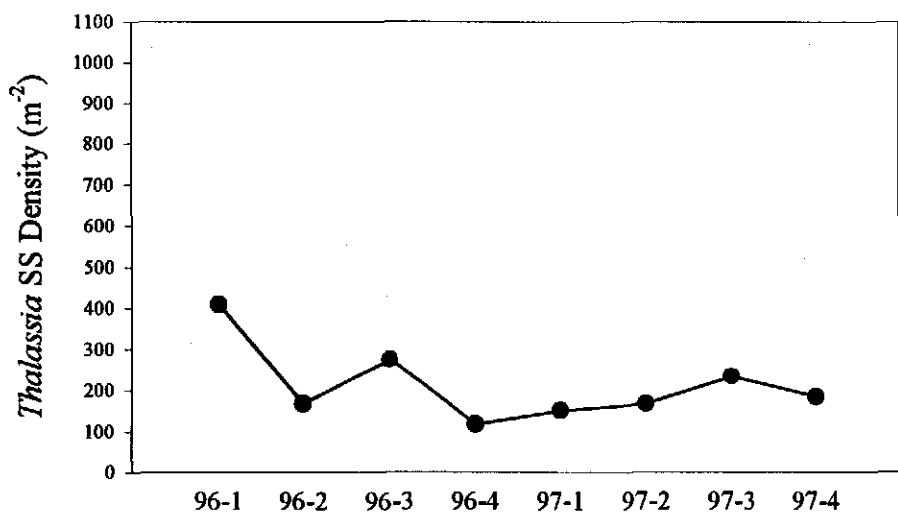
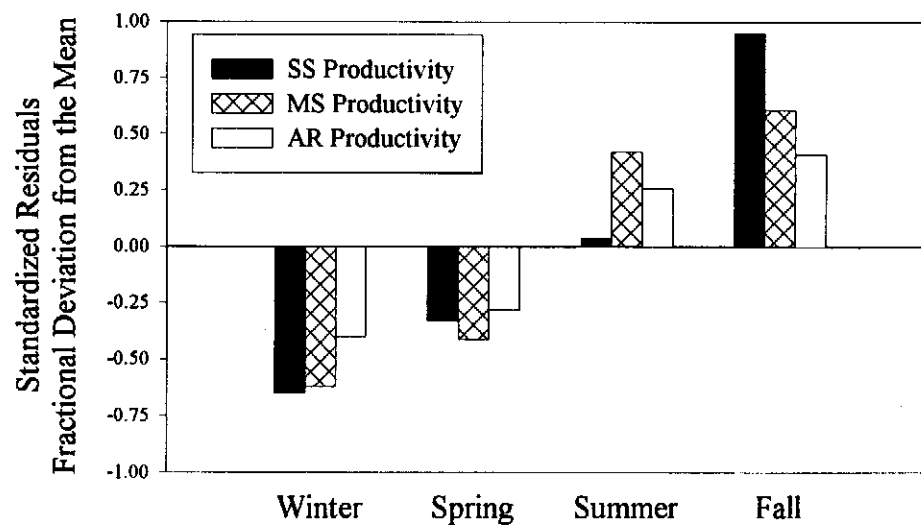
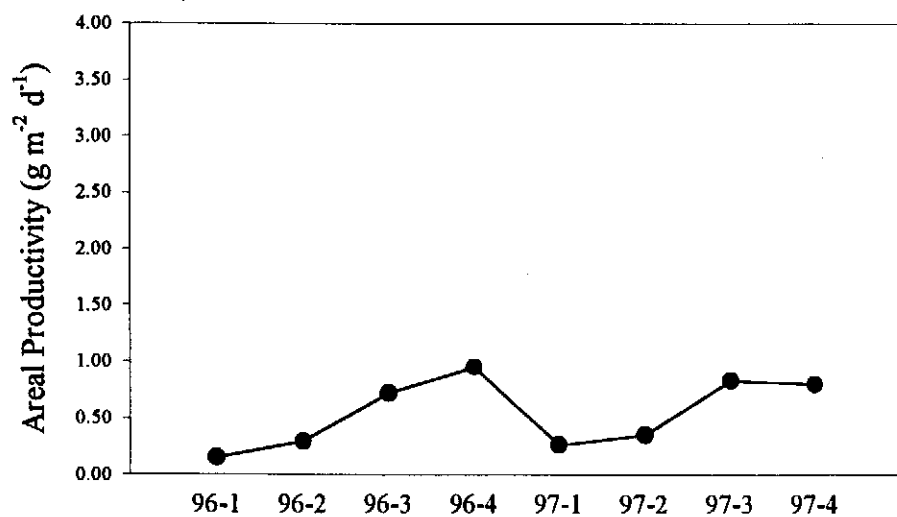
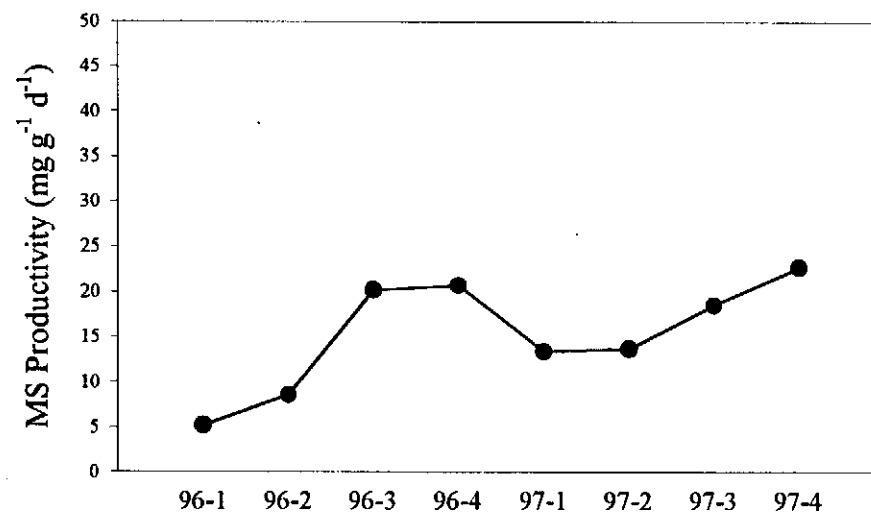
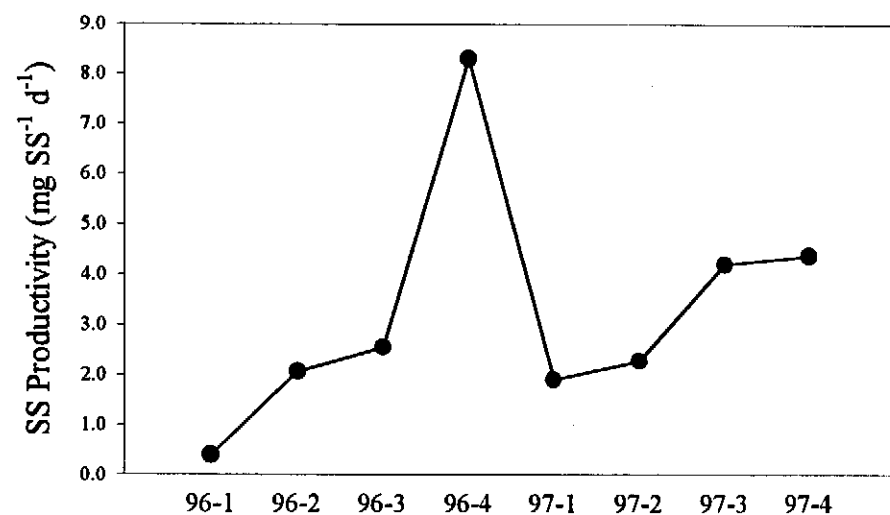


Figure 31a. Site 314. Braun-Blanquet estimates of frequency, abundance, and density of seagrasses and calcareous green algae, based on abundance scores from 10 random quadrats (50 x 50 cm) along a 50 m line transect. Data have been collected on a quarterly basis for 2 years.



Sampling Dates

Figure 31b. Site 314. Mean short shoot (SS) density, standing crop, and leaf mass of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed (10 x 20 cm) quadrats. Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 31c. Site 314. Mean short shoot (SS), mass-specific (MS), and areal productivity of *Thalassia testudinum*. Estimates were derived from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).

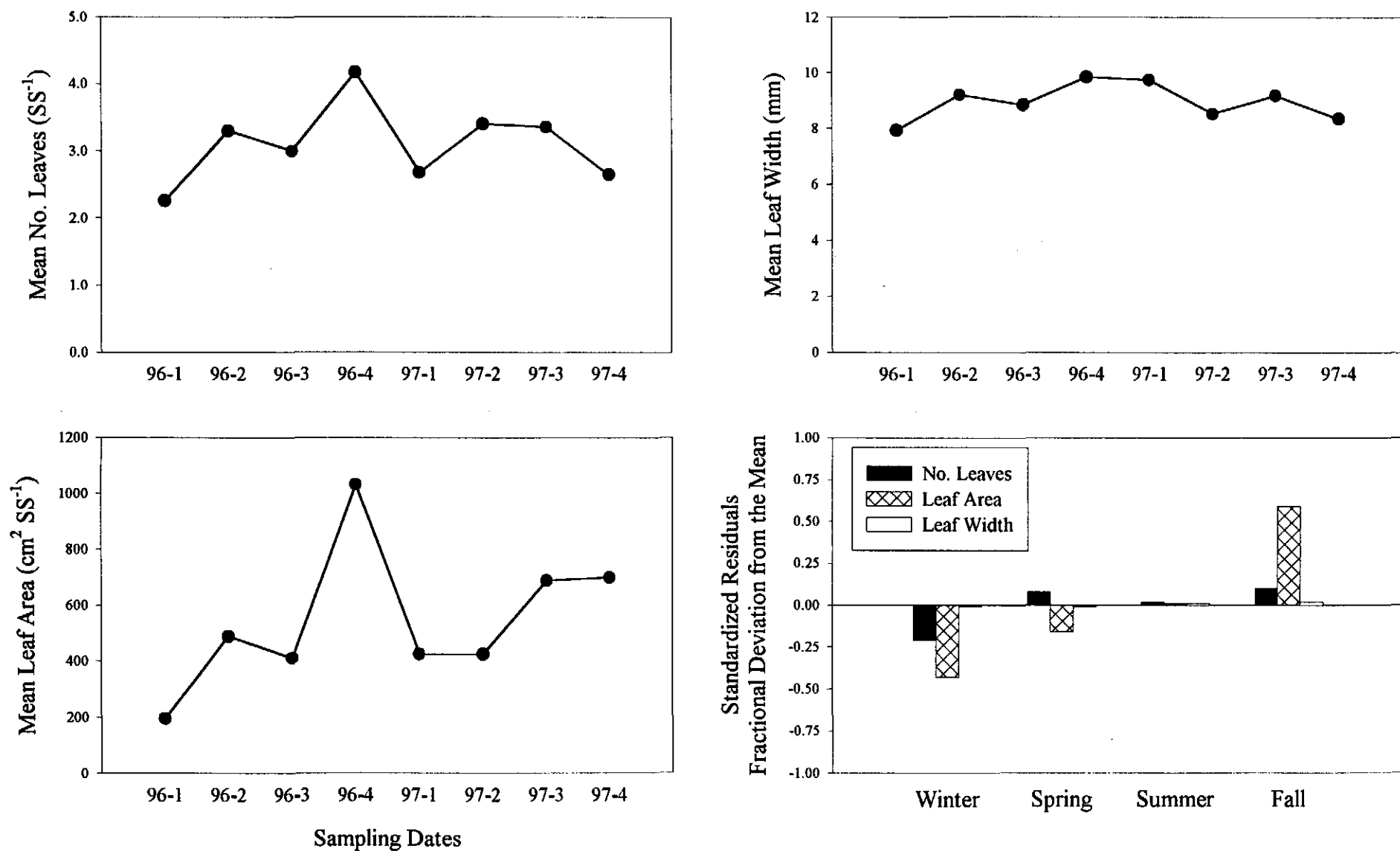
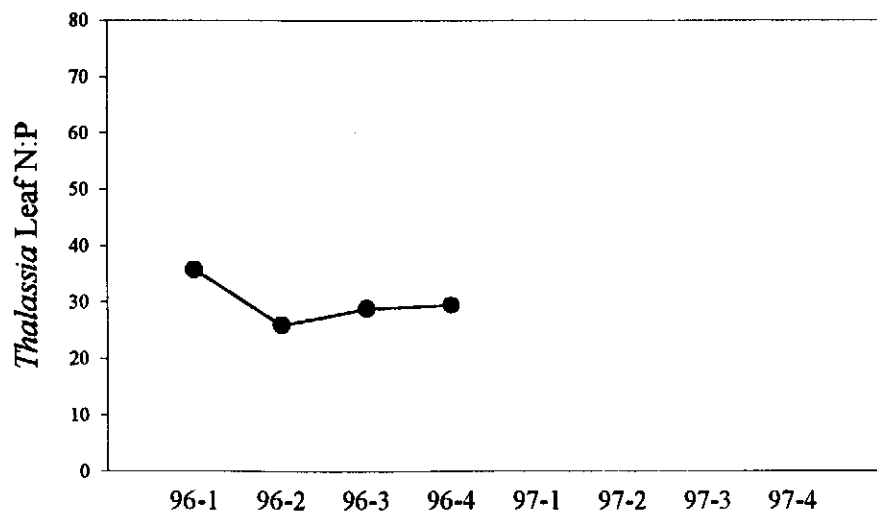
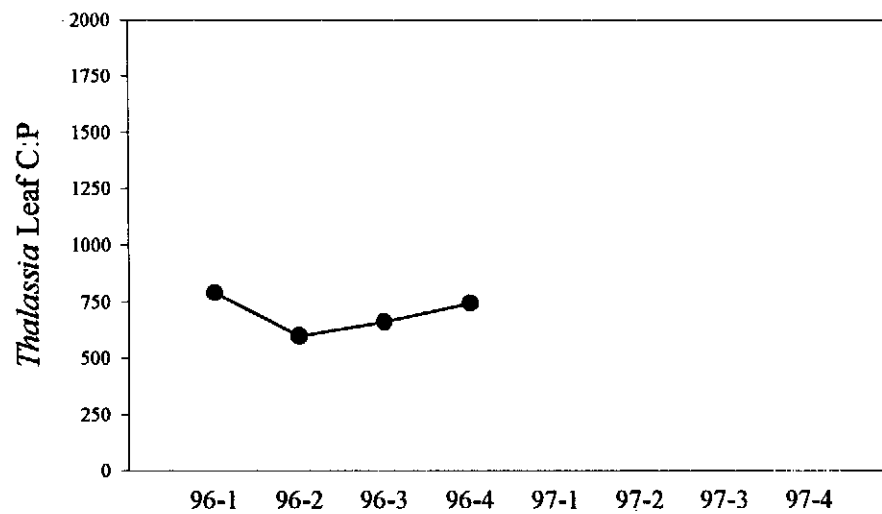
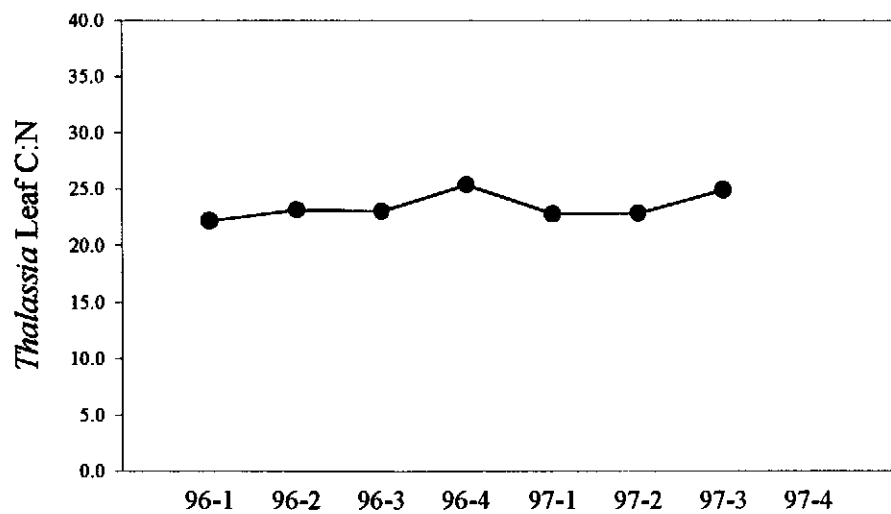


Figure 31d. Site 314. Mean number of leaves, leaf width, and leaf area of *Thalassia testudinum*. Estimates are derived from seagrasses harvested from 6 haphazardly-placed quadrats (10 x 20 cm). Data were collected for 2 years, with mean seasonal responses presented as fractional deviations from the mean (lower, right-hand graph).



Sampling Dates

Figure 31e. Site 314. Leaf elemental ratios (C:N, C:P, and N:P) of *Thalassia testudinum*. Data were collected for 2 years. Missing data are currently being processed.

Section III: Spatiotemporal Patterns in the FKNMS

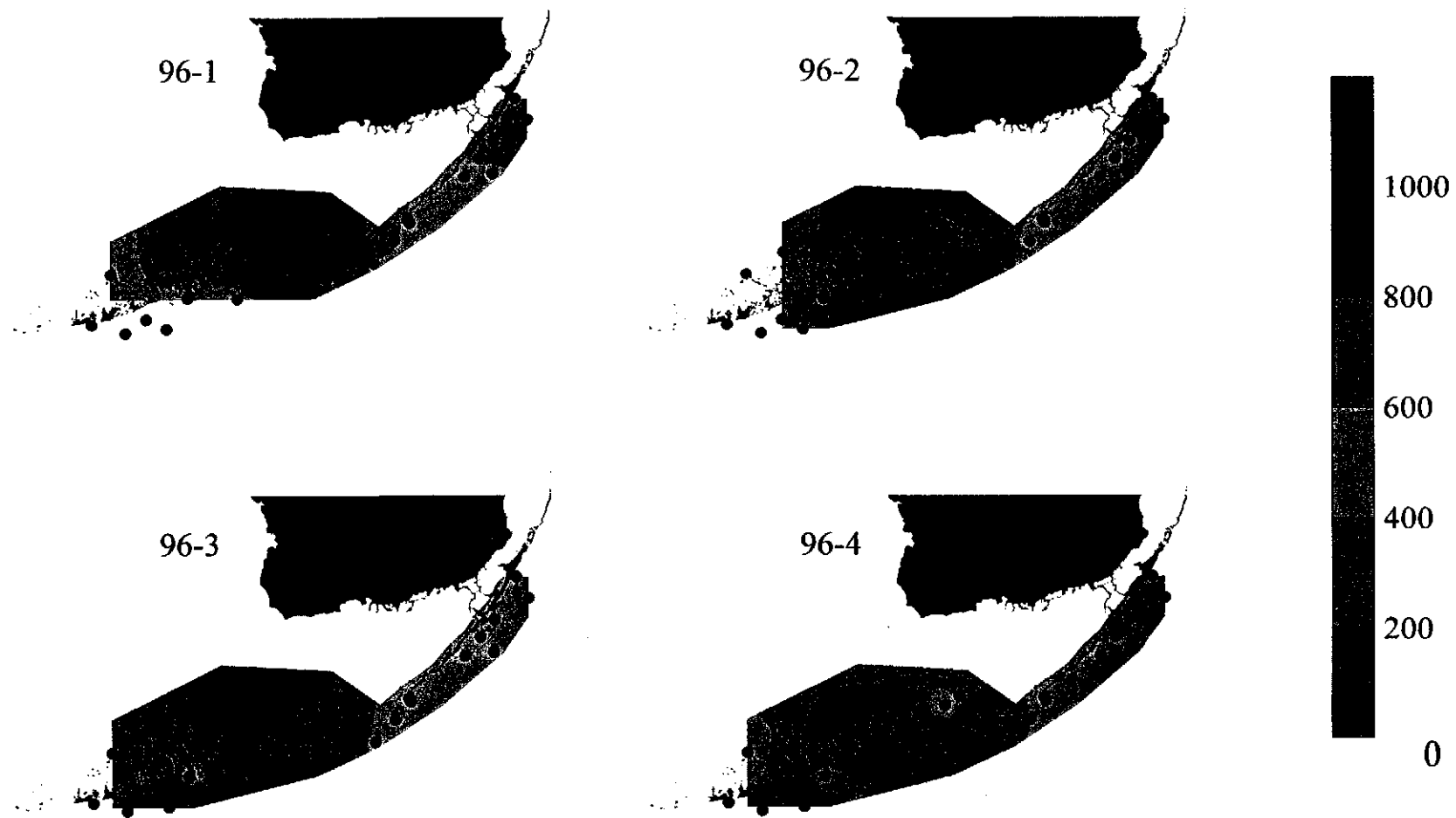


Figure 32a. Contours of *Thalassia testudinum* short shoot density (m^{-2}) for individual sampling dates in 1996.

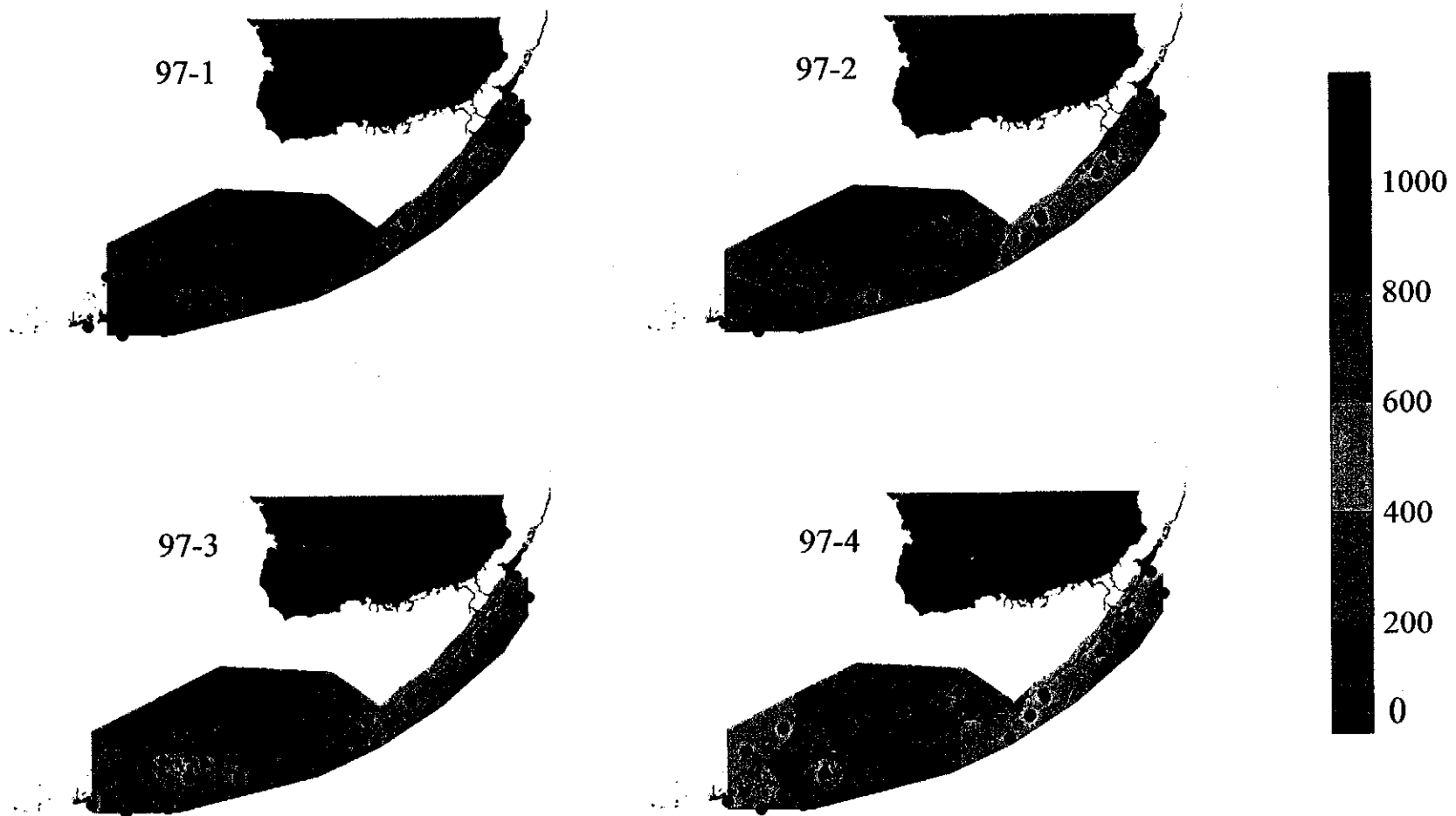


Figure 32b. Contours of *Thalassia testudinum* short shoot density (m^{-2}) for individual sampling dates in 1997.



Figure 33a. Contours of *Thalassia testudinum* standing crop (g m^{-2}) for individual sampling dates in 1996.

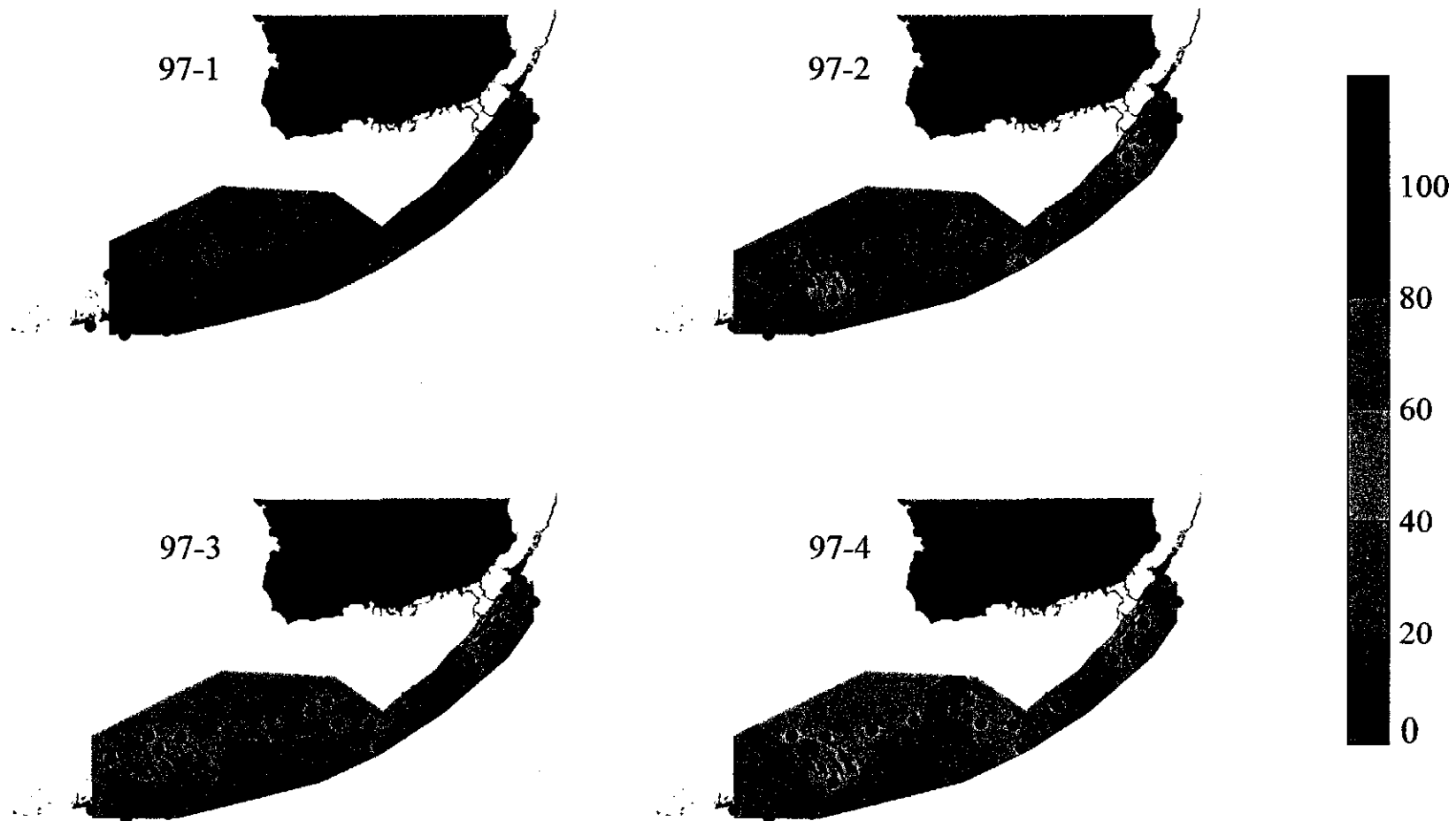


Figure 33b. Contours of *Thalassia testudinum* standing crop (g m^{-2}) for individual sampling dates in 1997.



Figure 34b. Contours of *Thalassia testudinum* leaf mass (mg SS^{-1}) for individual sampling dates in 1997.



Figure 34a. Contours of *Thalassia testudinum* leaf mass (mg SS^{-1}) for individual sampling dates in 1996.

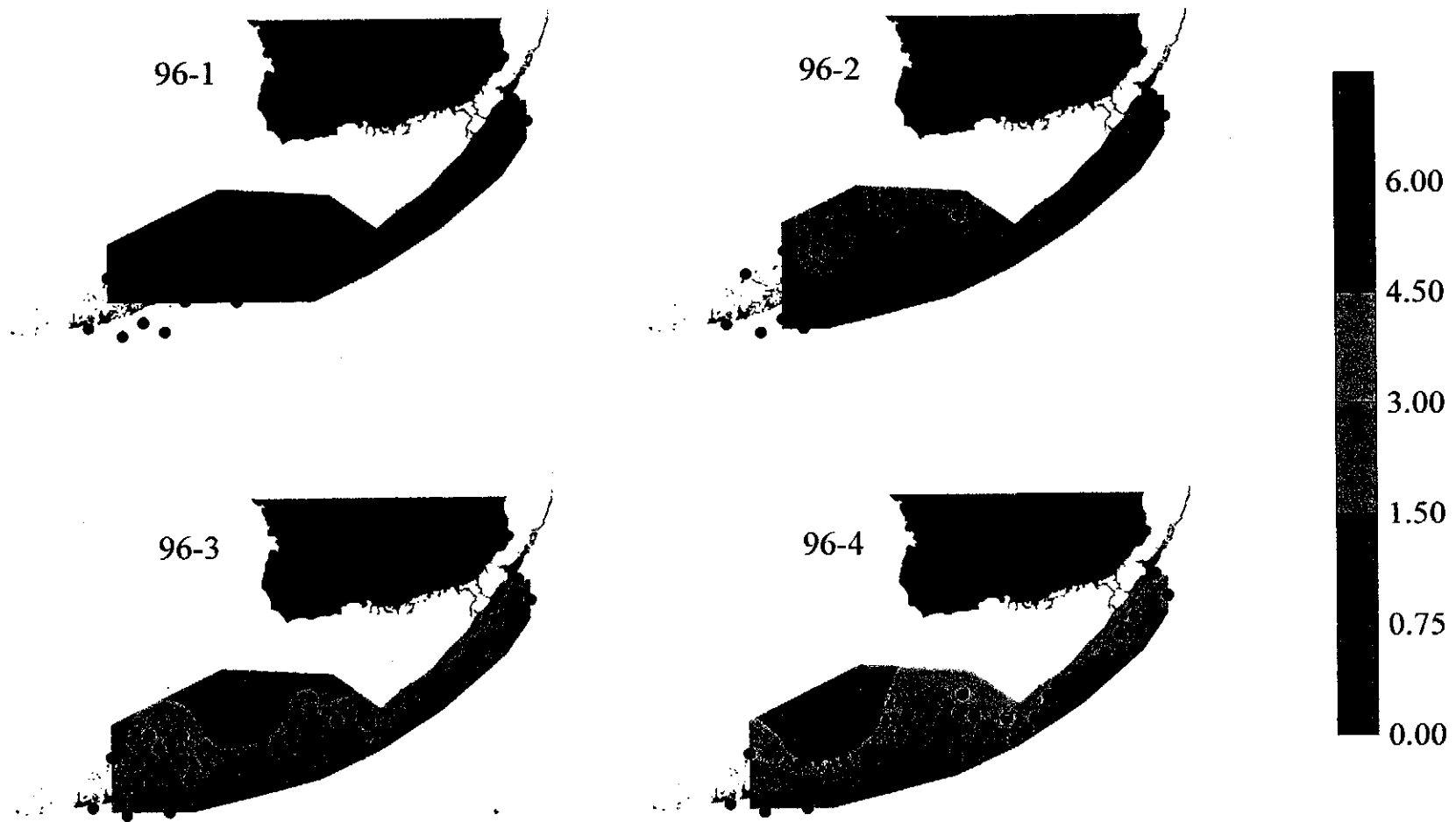


Figure 35a. Contours of *Thalassia testudinum* short shoot productivity ($\text{mg SS}^{-1} \text{d}^{-1}$) for individual sampling dates in 1996.

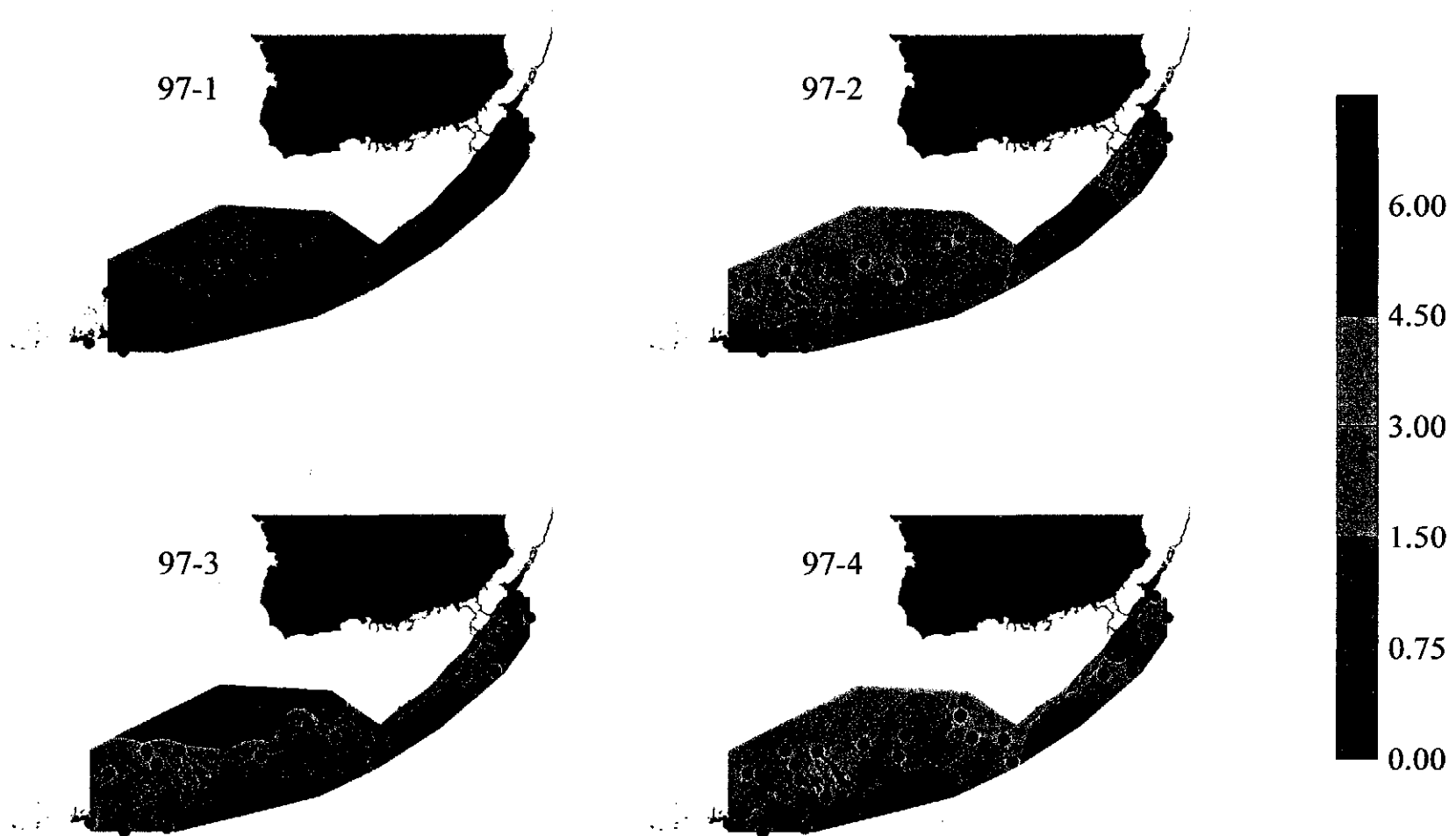


Figure 35b. Contours of *Thalassia testudinum* short shoot productivity ($\text{mg SS}^{-1} \text{d}^{-1}$) for individual sampling dates in 1997.

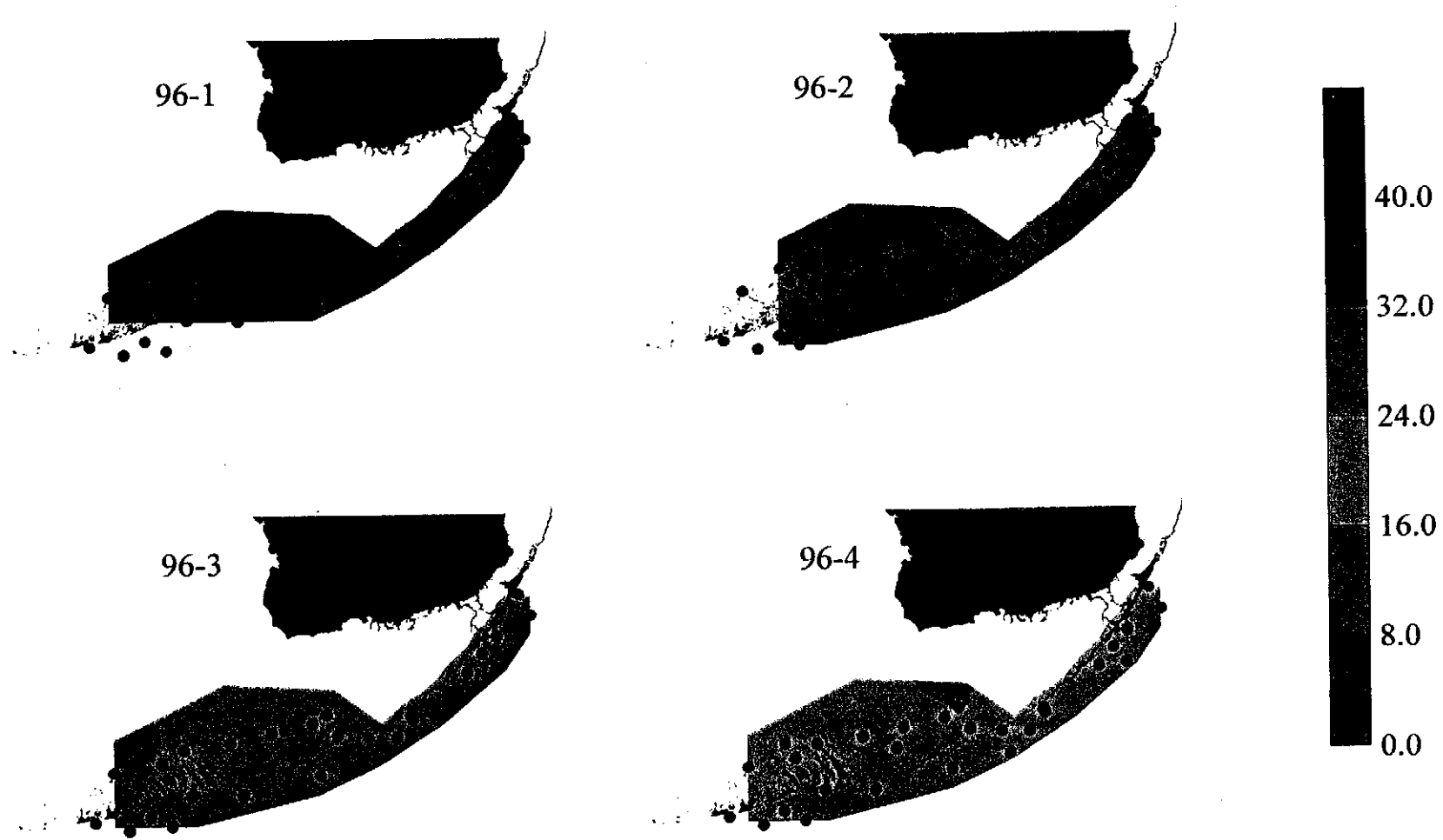


Figure 36a. Contours of *Thalassia testudinum* mass-specific productivity ($\text{mg g}^{-1} \text{d}^{-1}$) for individual sampling dates in 1996.

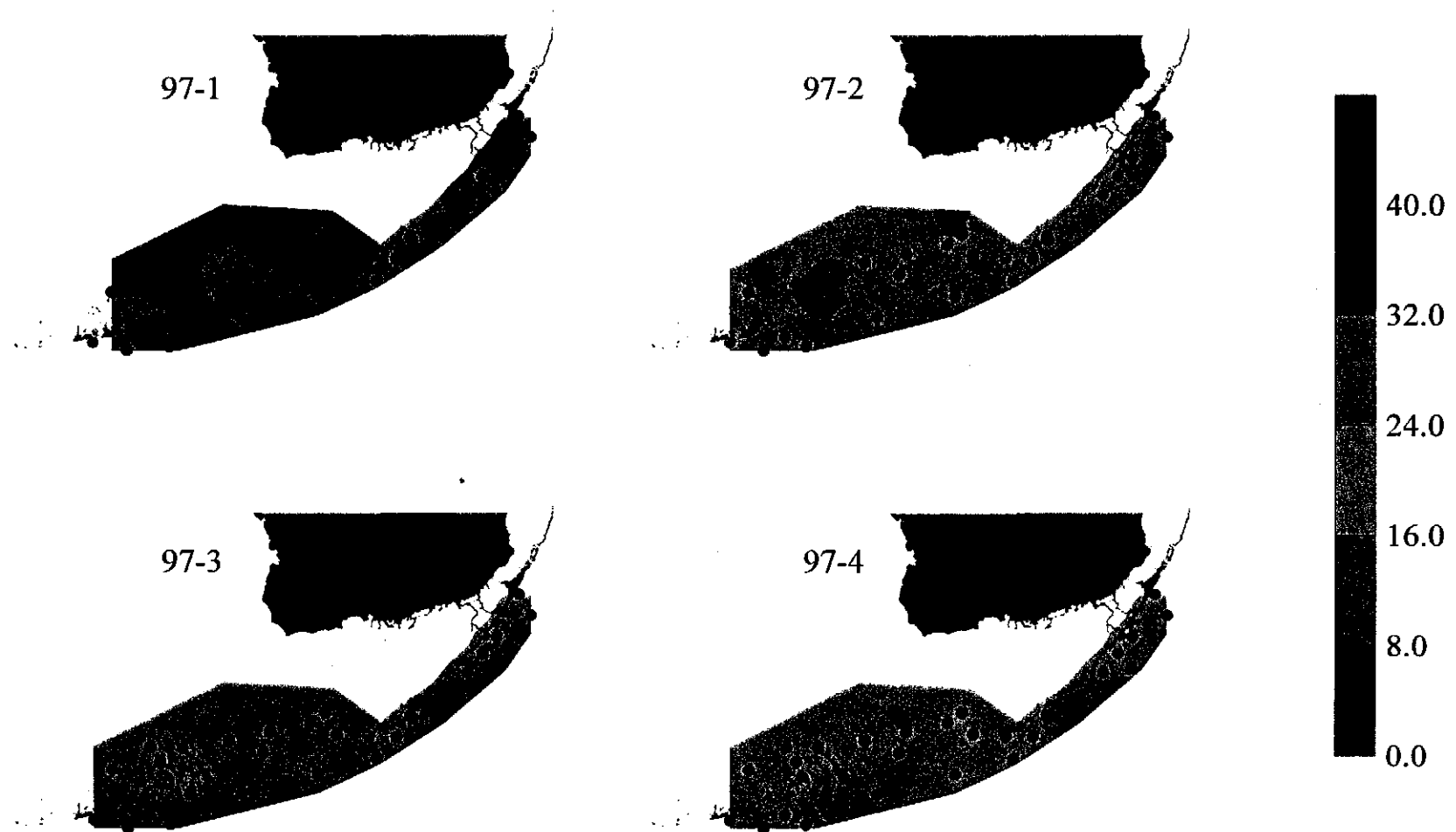


Figure 36b. Contours of *Thalassia testudinum* mass-specific productivity ($\text{mg g}^{-1} \text{d}^{-1}$) for individual sampling dates in 1997.

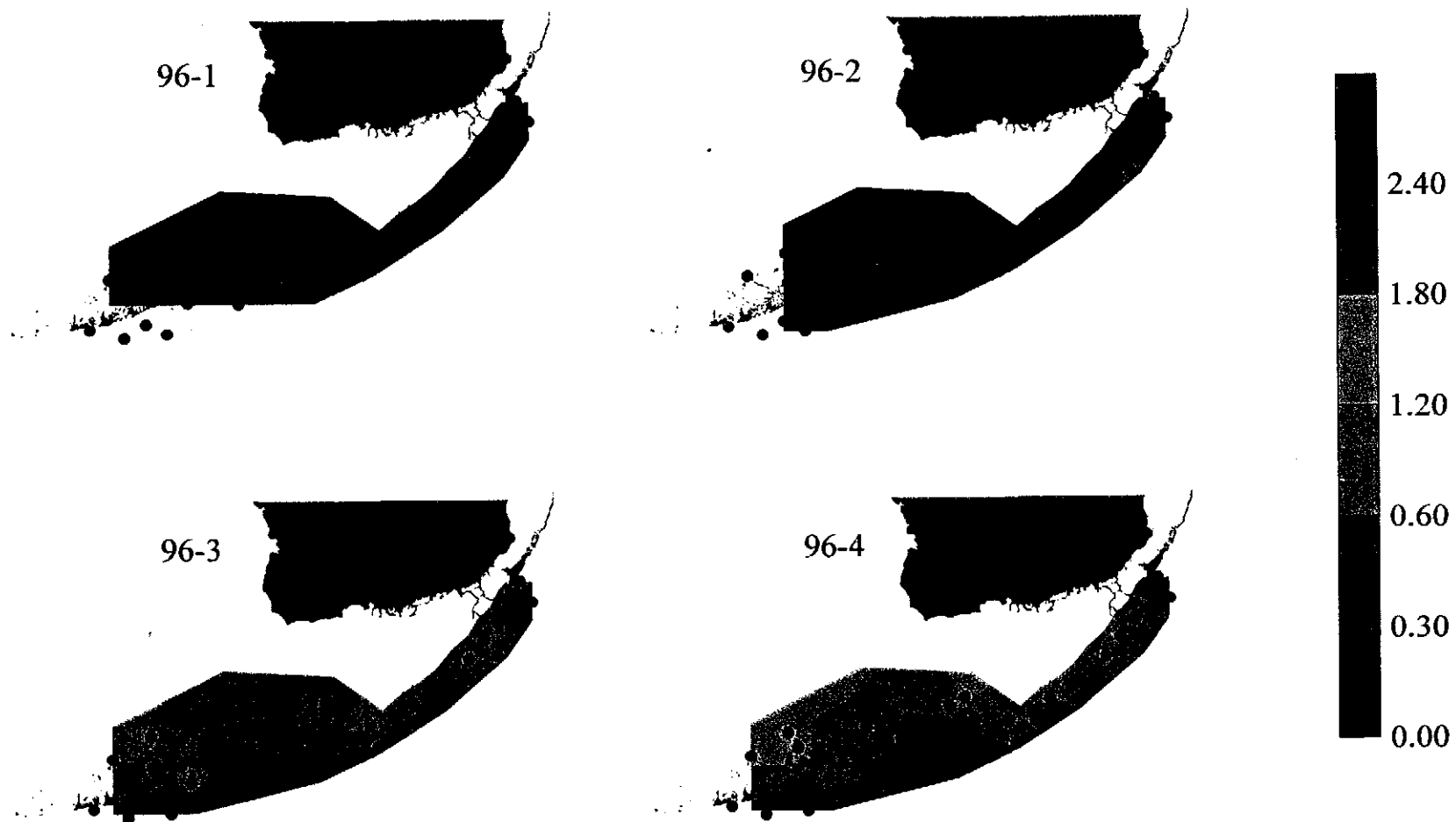


Figure 37a. Contours of *Thalassia testudinum* areal productivity ($\text{g m}^{-2} \text{d}^{-1}$) for individual sampling dates in 1996.

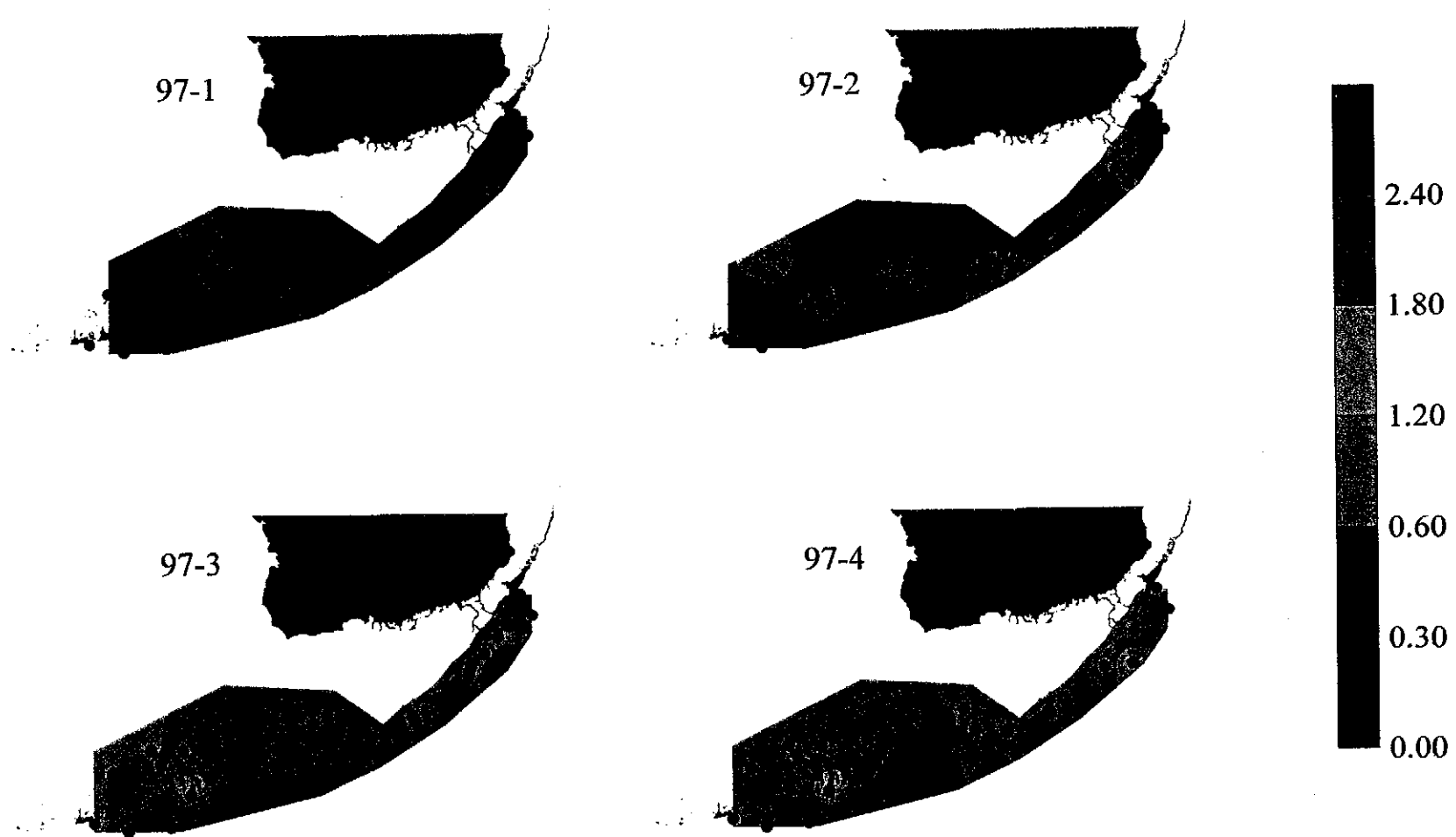


Figure 37b. Contours of *Thalassia testudinum* areal productivity ($\text{g m}^{-2} \text{d}^{-1}$) for individual sampling dates in 1997.

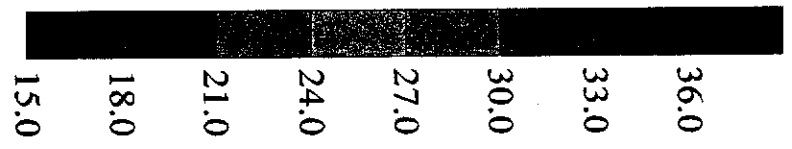
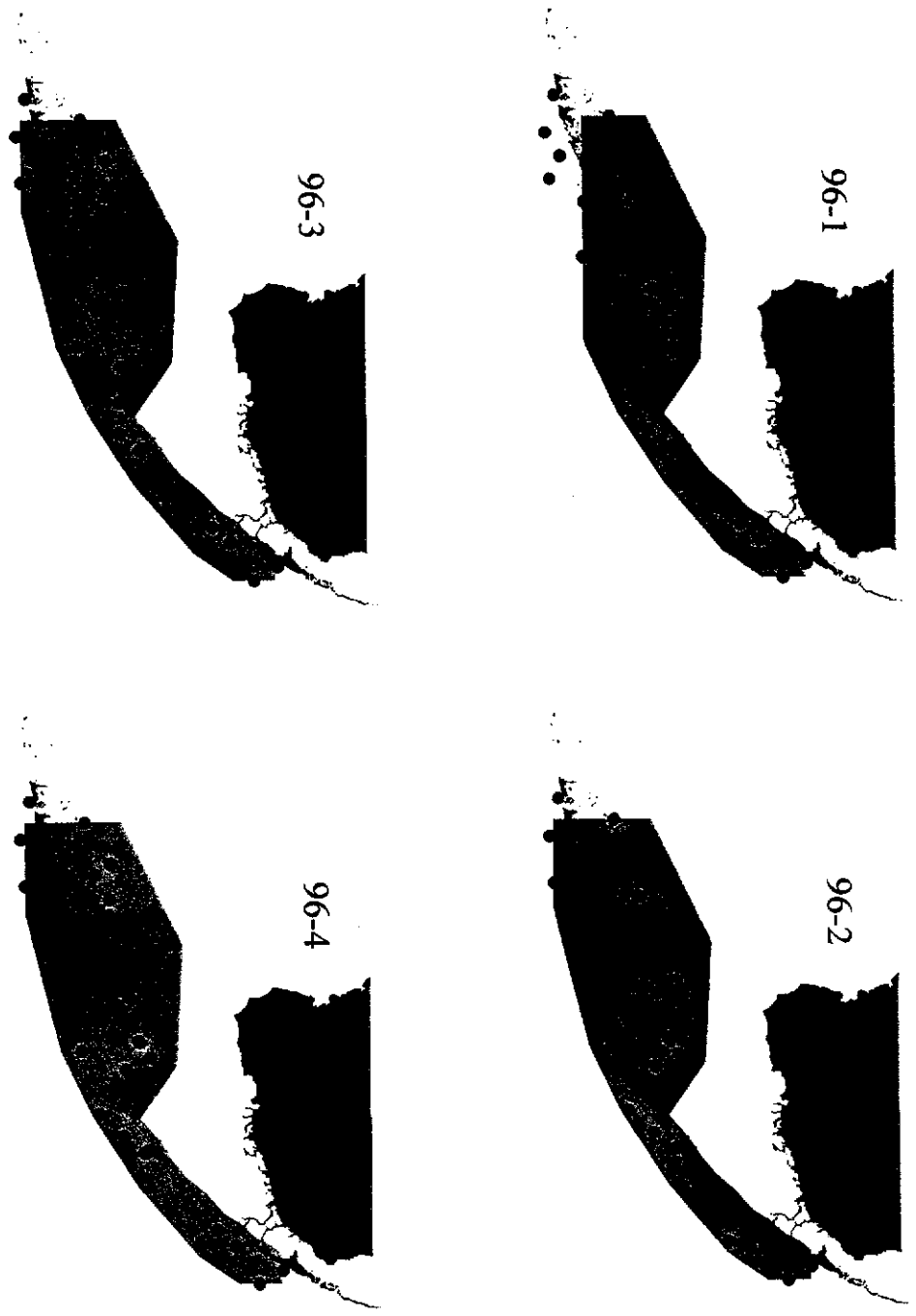


Figure 38a. Contours of *Thalassia testudinum* leaf C:N for individual sampling dates in 1996.

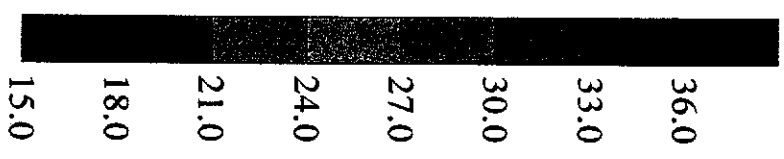
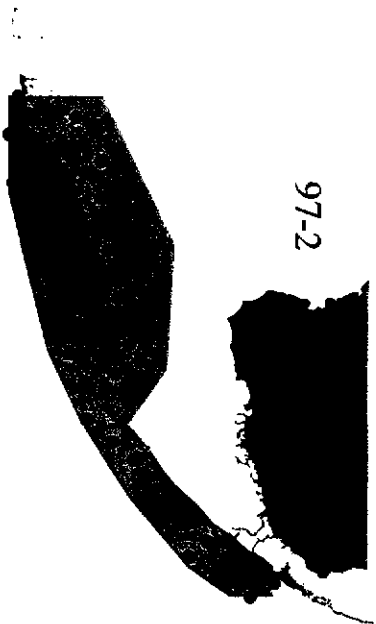


Figure 38b. Contours of *Thalassia testudinum* leaf C:N for individual sampling dates in 1997.

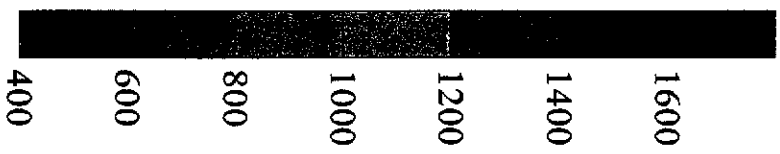
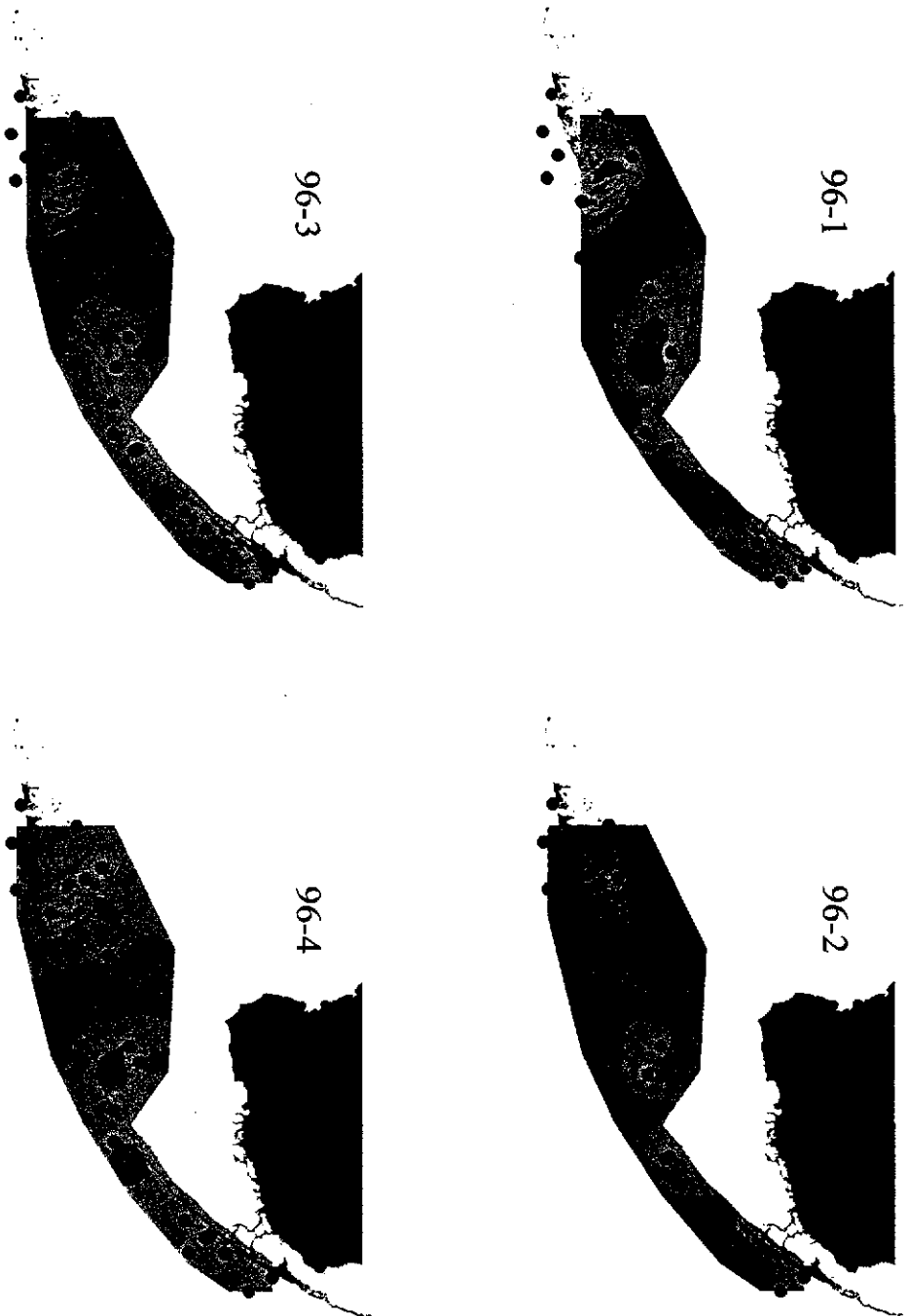


Figure 39a. Contours of *Thalassia testudinum* leaf C:P for individual sampling dates in 1996.

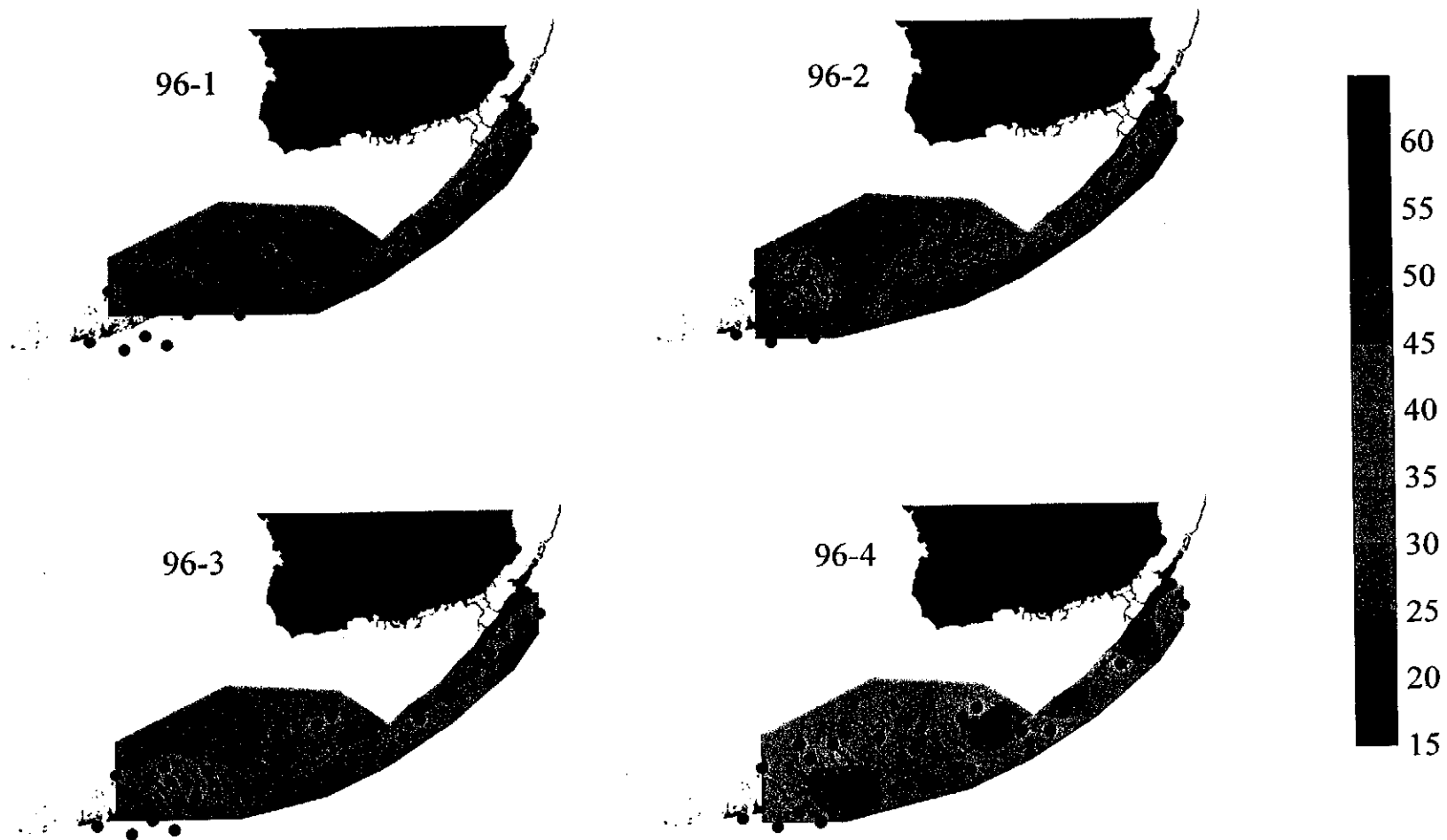


Figure 40a. Contours of *Thalassia testudinum* leaf C:P for individual sampling dates in 1996.