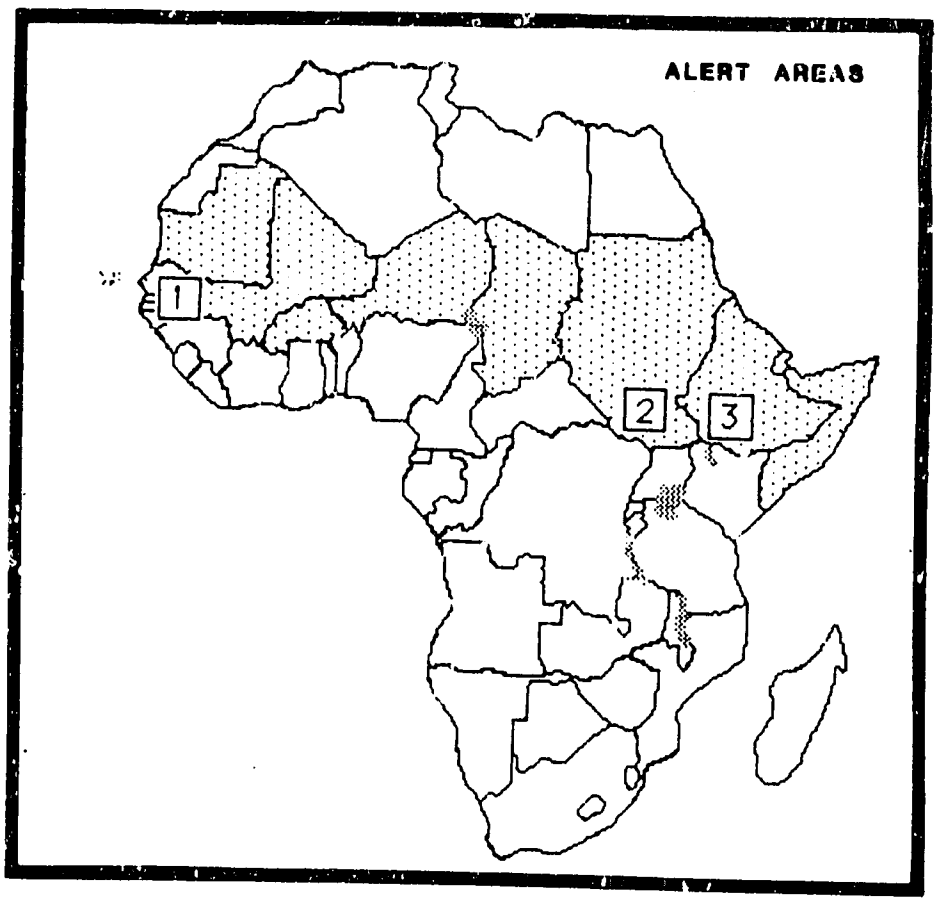
PN-ABE-429

SPECIAL CLIMATE IMPACT ASSESSMENT

SAHEL / HORN OF AFRICA

REGIONAL AND COUNTRY ANALYSIS



NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE (NESDIS)
ASSESSMENT AND INFORMATION SERVICES CENTER (AISC)

PREPARED IN SUPPORT OF THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

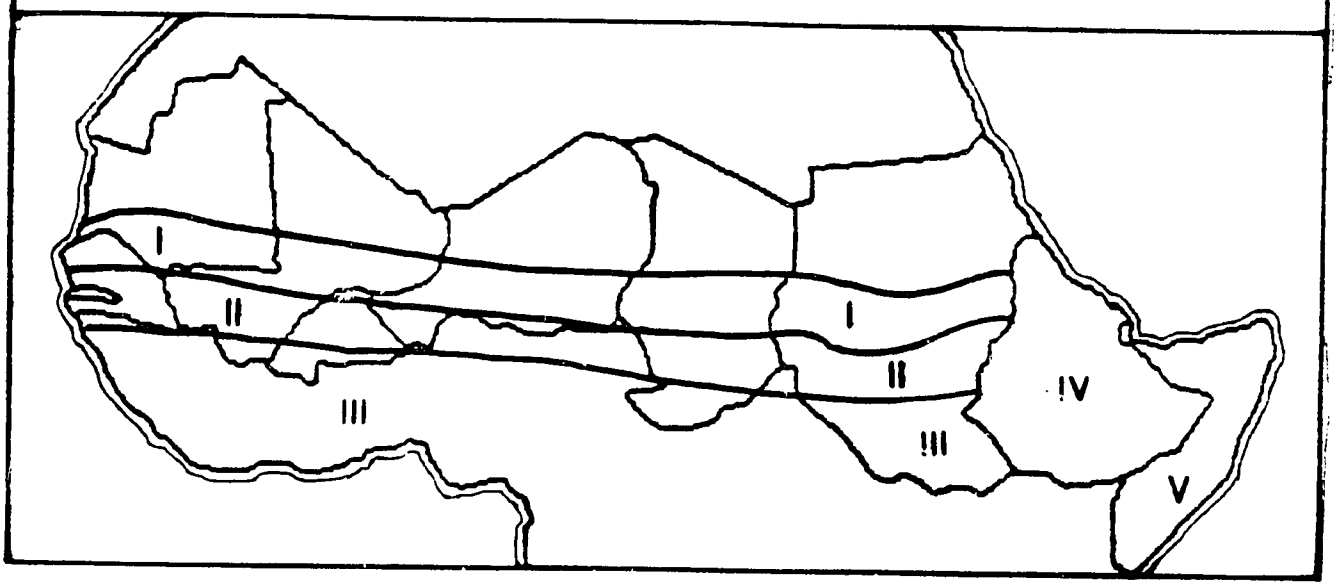
JUNE 1986

ISSUED ON JULY 7, 1986

VOLUME 2, NUMBER 1

NORMAL PLANTING/HARVESTING DATES

CROP CALENDAR REGIONS



SAHEL/HORN MAIN SEASON CROP CALENDAR

Zone	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	Annual Rainfall
I. Sahel				/////--------		0000000				250 - 600 mm
II. Soudan				////	----------	000000000				600 - 1,000 mm
III. Soudano Guinean			////	----------		000000000				>1,000 mm
IV. Ethiopia [1]				//////	----------			0000000000		400 - 1,800 mm
V. Somalia [2]		/////	----------		000000000					250 - 600 mm

// Planting -- Growing 00 Harvesting

This table illustrates the expected planting and harvesting periods for non-irrigated cereals during the main growing season in the Sahel/Soudan zones and in Ethiopia and Somalia. Planting and harvesting dates may vary widely from year to year, depending on the timing of the rainfall. Planting usually begins when the rainy season begins.

1 Secondary season crops planted late Feb. to early Apr. and harvested late Jun. thru July.

2 Minor season crops planted Oct. to early Nov., harvested late Jan. to early Mar.

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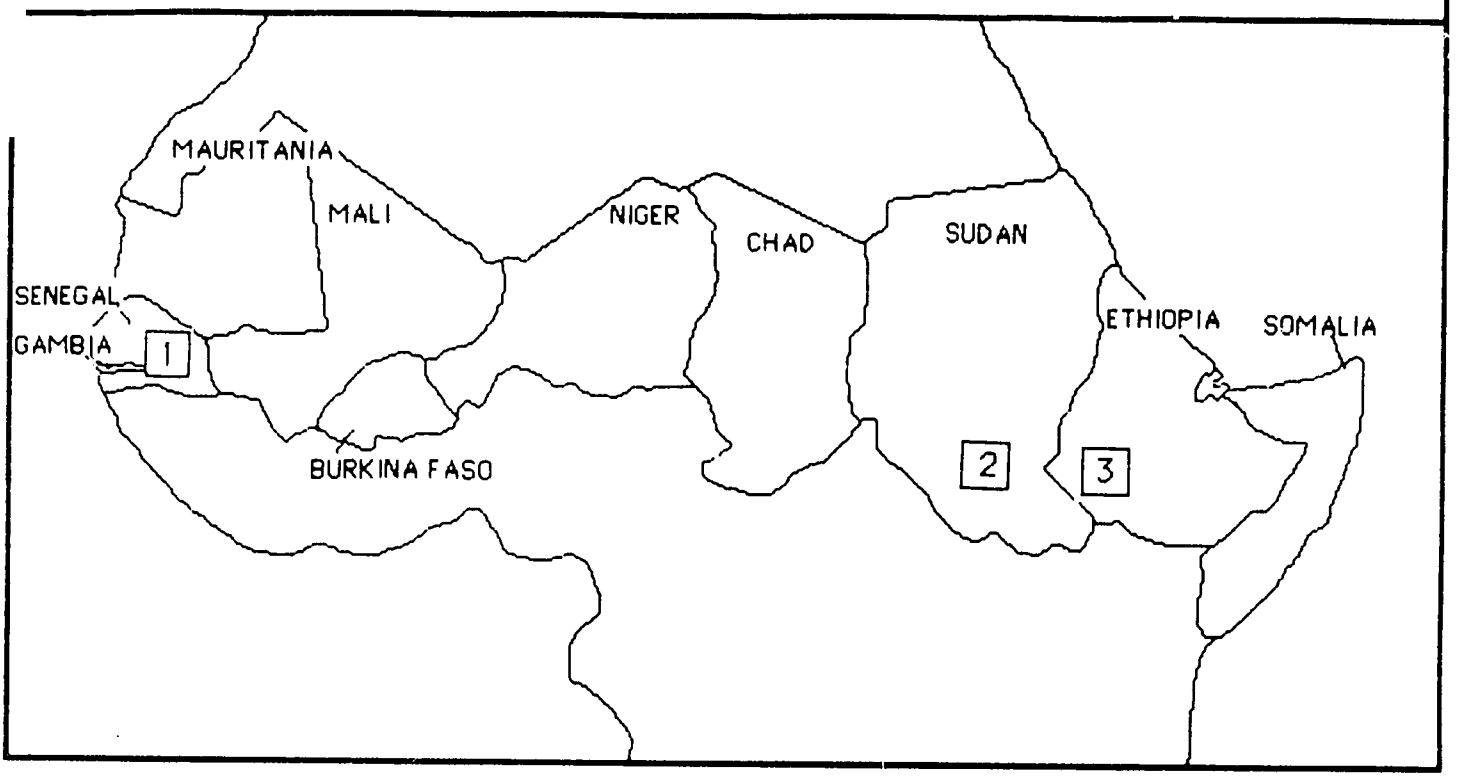
REGIONAL ANALYSIS

ALERT AREAS

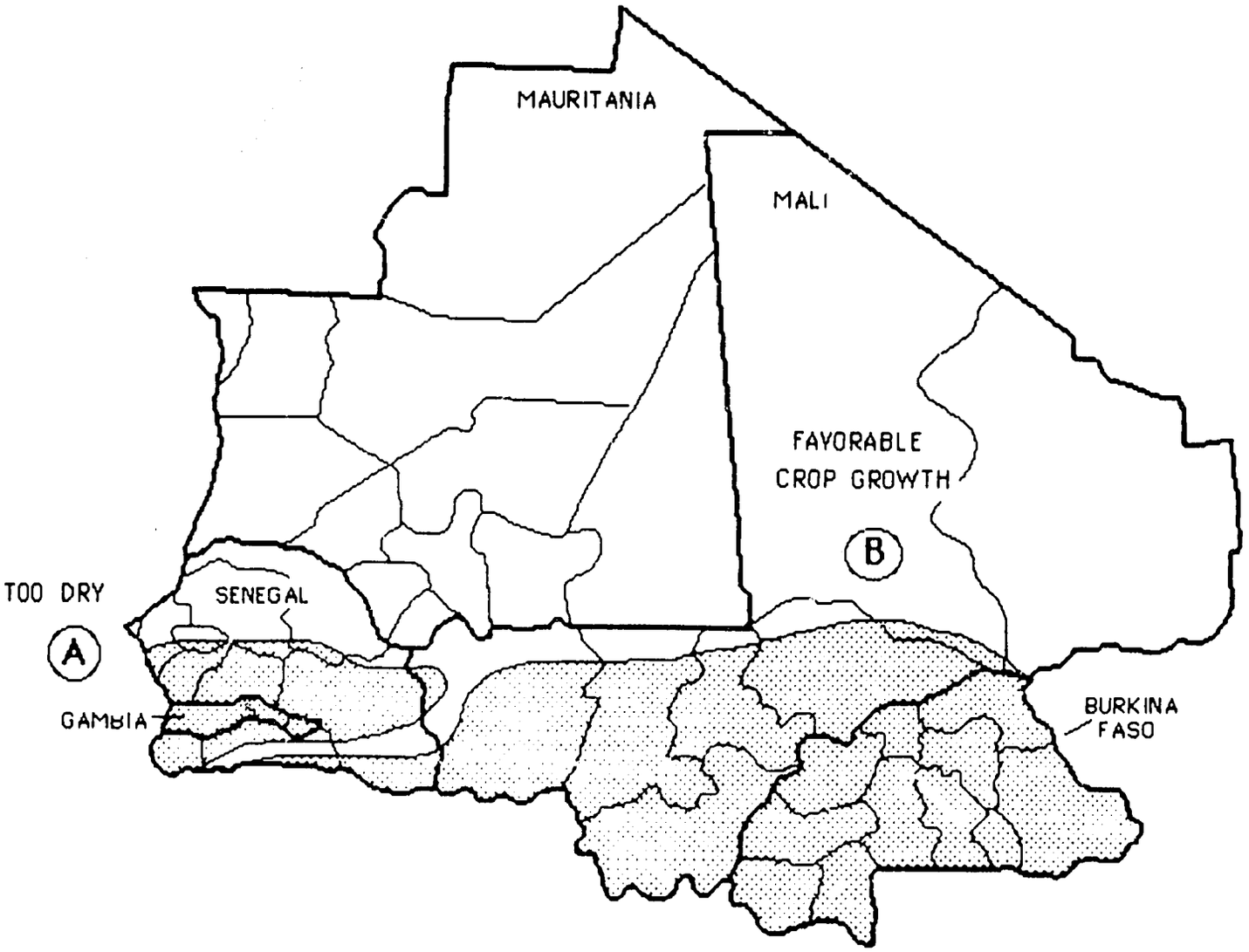


1 Dry weather delayed crop and pasture growth in Senegal and Gambia.

2 Showers relieved dryness in southern Sudan, though early-planted crop prospects remain below average.

3 Below-normal rainfall in western Ethiopia during March-May reduced early season crop yields.

HIGHLIGHTS



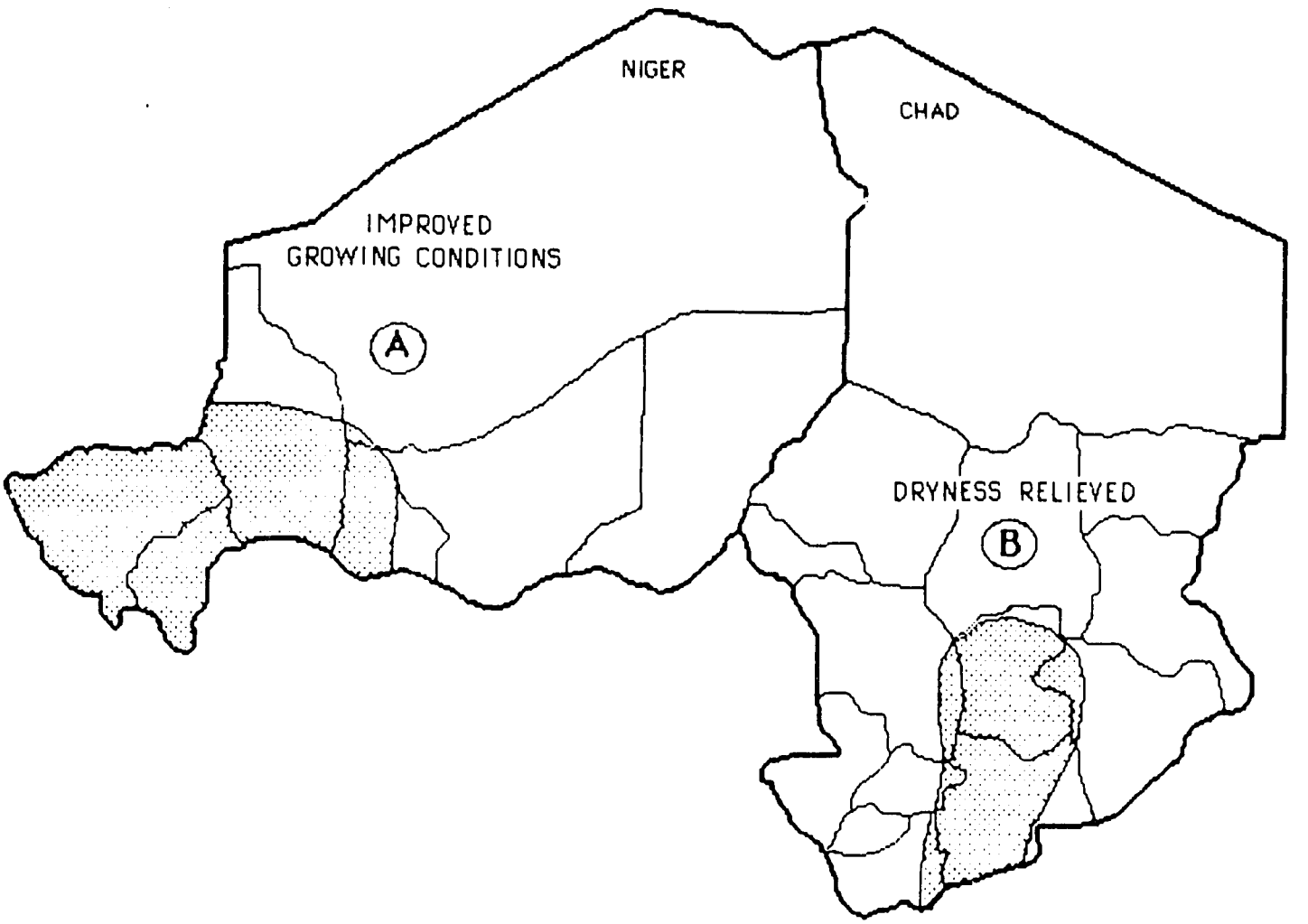
(A) TOO DRY

Dry weather in June delayed germination and growth of cereals over much of Senegal and Gambia. Widespread showers during the last two days of June may have signalled the start of the rainy season. A favorable harvest is still possible if rainfall persists through September. As a result of good rains in May, vegetation is better than in 1984 and 1985 in extreme southeastern Senegal.

(B) FAVORABLE CROP GROWTH

Plentiful rainfall benefitted germination and growth of cereals in Mali and Burkina Faso. Especially good crop and pasture connditions prevail in southwestern Burkina and southern Mali (southern Sikasso province).

HIGHLIGHTS



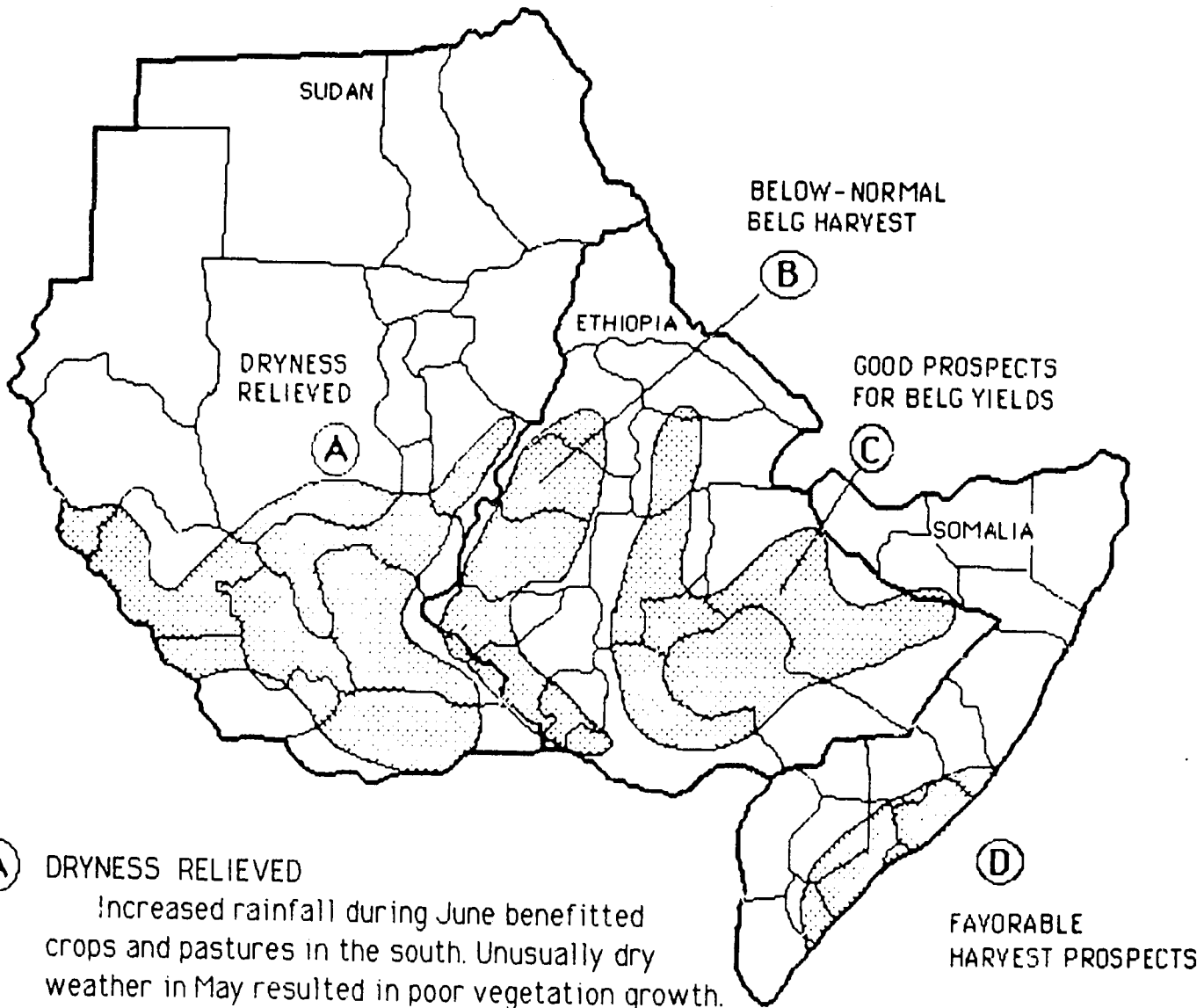
(A) IMPROVED GROWING CONDITIONS

By late June, rainfall covered much of southern Niger, benefitting planting of maize, sorghum, and millet. Overall prospects are average. Eastern areas were quite dry, but showers in late June promoted planting of cereals.

(B) DRYNESS RELIEVED

Increasing rains during June, especially the last 10 days, relieved dryness in southern Chad. Though June crop and pasture conditions were worse than last year, continued rainfall would produce favorable harvests. To the north, conditions remained quite dry in the Sahel zone, but not exceptionally so.

HIGHLIGHTS



(A) DRYNESS RELIEVED

Increased rainfall during June benefitted crops and pastures in the south. Unusually dry weather in May resulted in poor vegetation growth. Potential yields of early-planted crops were affected, but crops planted in June are mostly in good condition. To the north, in major growing areas, conditions are near normal.

(B) BELOW-NORMAL BELG HARVEST

Dryness in April and May reduced early (belg) season yields in western Ethiopia and delayed planting of main season crops. Though this is not a major belg-producing area, local food deficits are possible. Heavy rainfall in June relieved the dryness

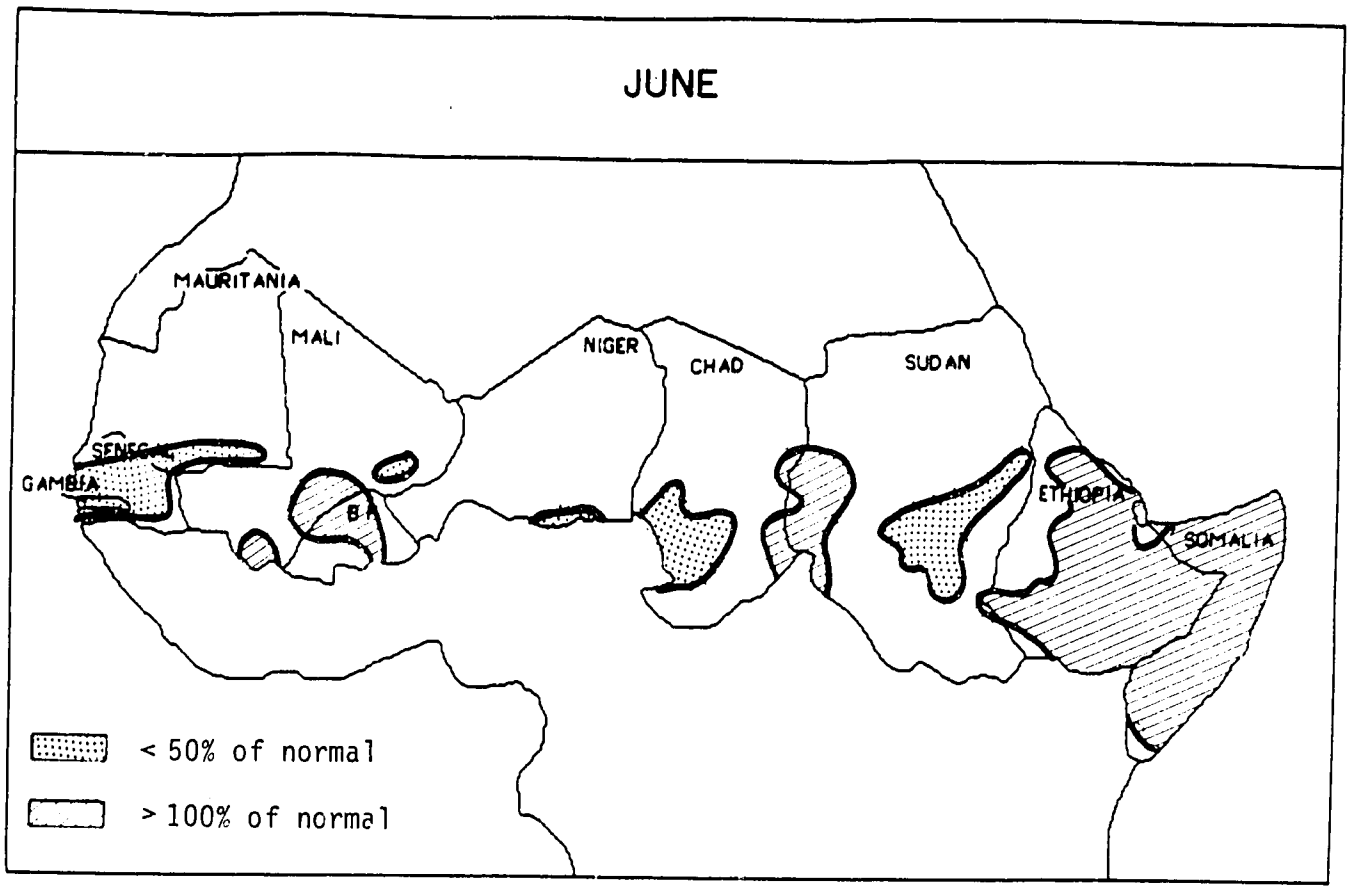
(C) GOOD PROSPECTS FOR BELG YIELDS

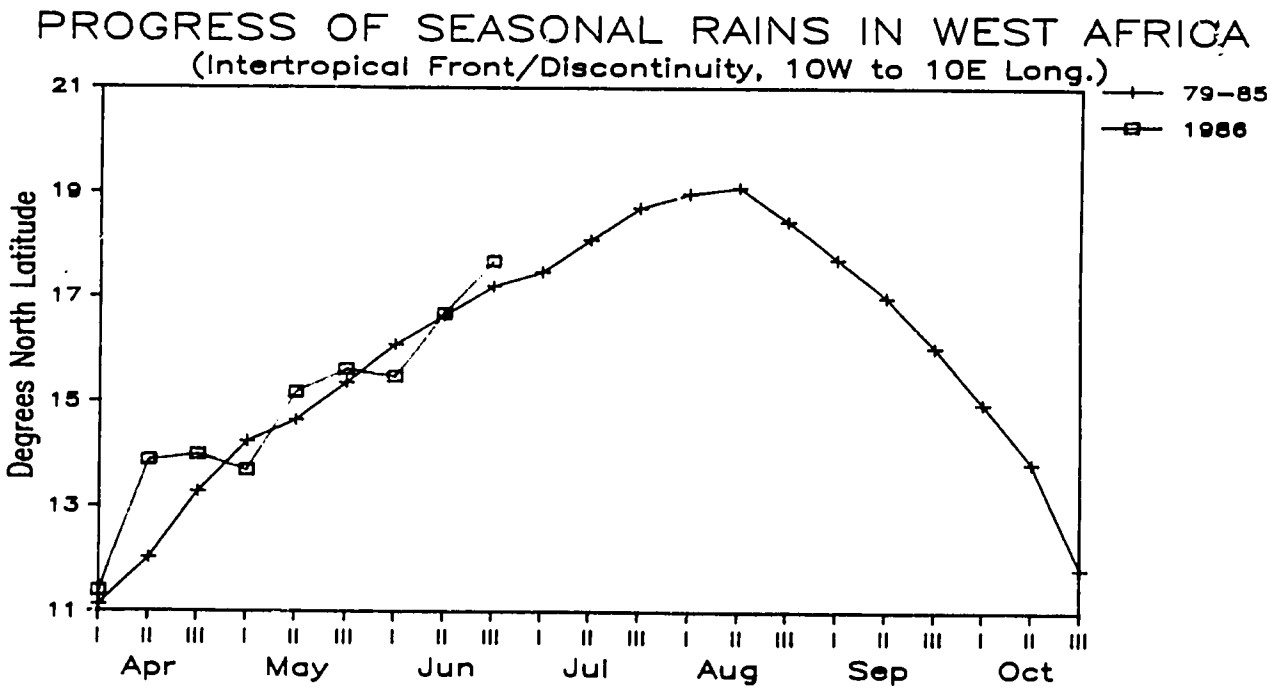
Overall prospects for Ethiopia's early (belg) season harvest, now in progress, remain favorable due to plentiful March-May rainfall.

(D) FAVORABLE HARVEST PROSPECTS

As June rainfall appeared to be at least average, harvest prospects for the main season crops (July-August harvest) are above normal

MONTHLY RAINFALL





Since early May, the ITF (ITD) has been fluctuating only slightly about its seven-year mean position, moving to just north of the mean by late June as rainfall advanced deep into the Sahel zone. (The rainfall is located 100-200 km south of the ITF.)

COUNTRY ANALYSES

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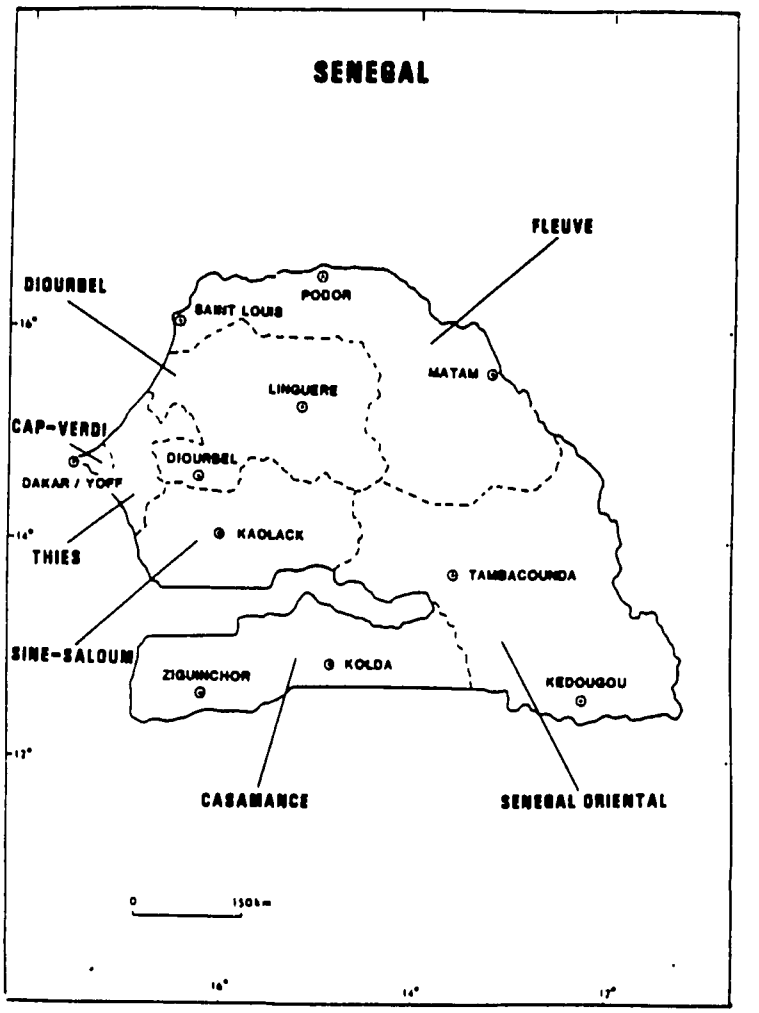
SENEGAL ASSESSMENT



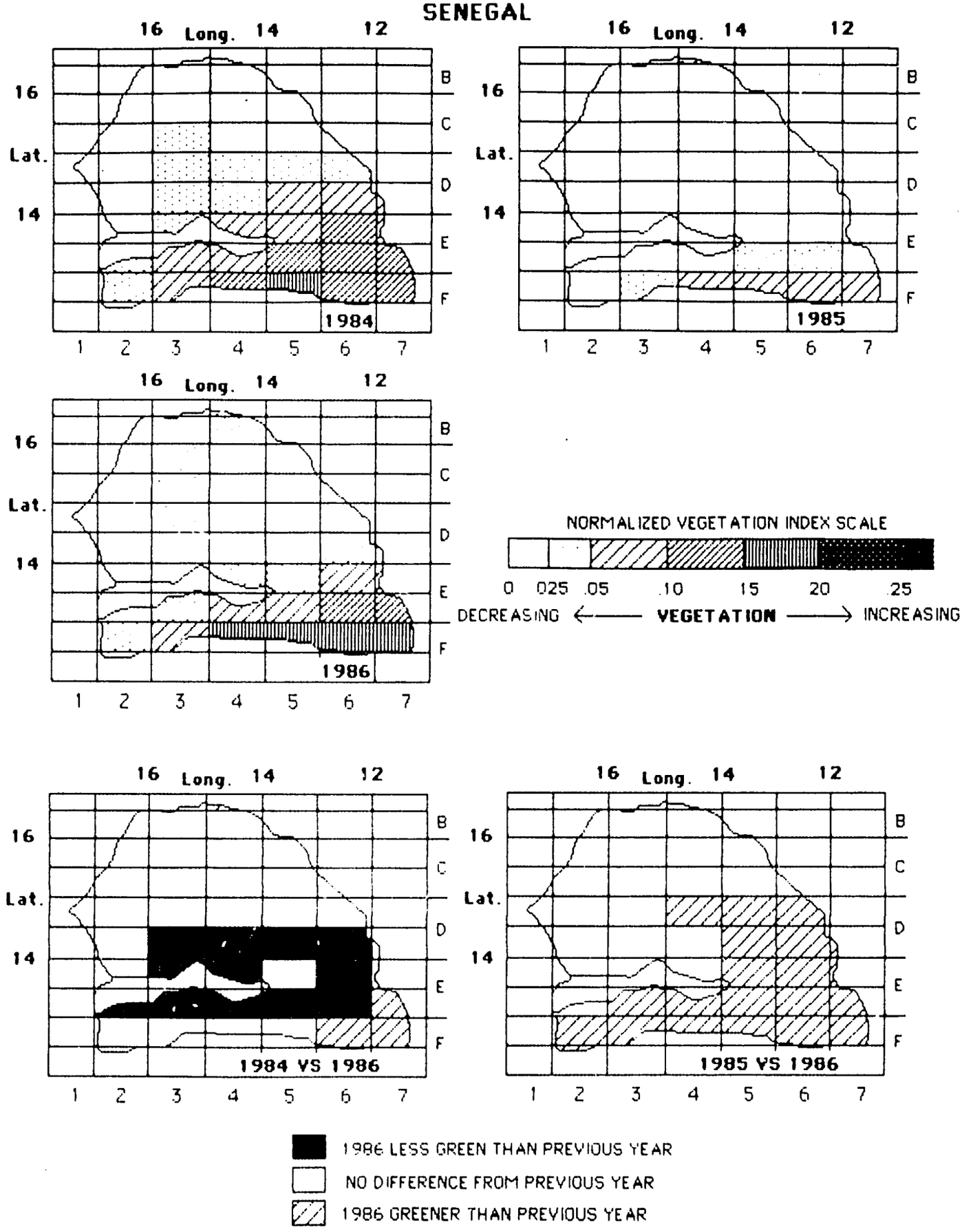
* Crops and pastures got off to a late start but a favorable harvest is still possible if regular rains persist through September. Dry conditions delayed growth of crops and pastures. Most of the rainfall in June was limited to southeastern Senegal. Soil moisture was low to non-existent from Tambacounda city northward, resulting in delayed planting or re-planting of earlier sown crops. A thunderstorm complex finally brought needed moisture to Kaolack, Tambacounda, and Kolda on June 29, promoting growth of recently-planted cereals and groundnuts.

* Satellite NVI data (see maps and time series) and imagery show greater vegetation growth in the south this year than last due to plentiful May rainfall. Growth was also delayed last year because of dry June weather, but regular rainfall from July through Septmber resulted in excellent crop yields. Compared with 1984, however, June crop and pasture conditions this year appeared worse in southern Senegal except in the extreme southeast.

NOAA SATELLITE NORMALIZED VEGETATION INDEX

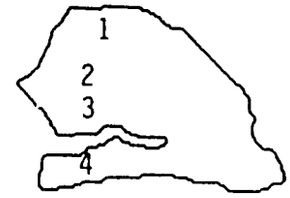
THIRD WEEK OF JUNE

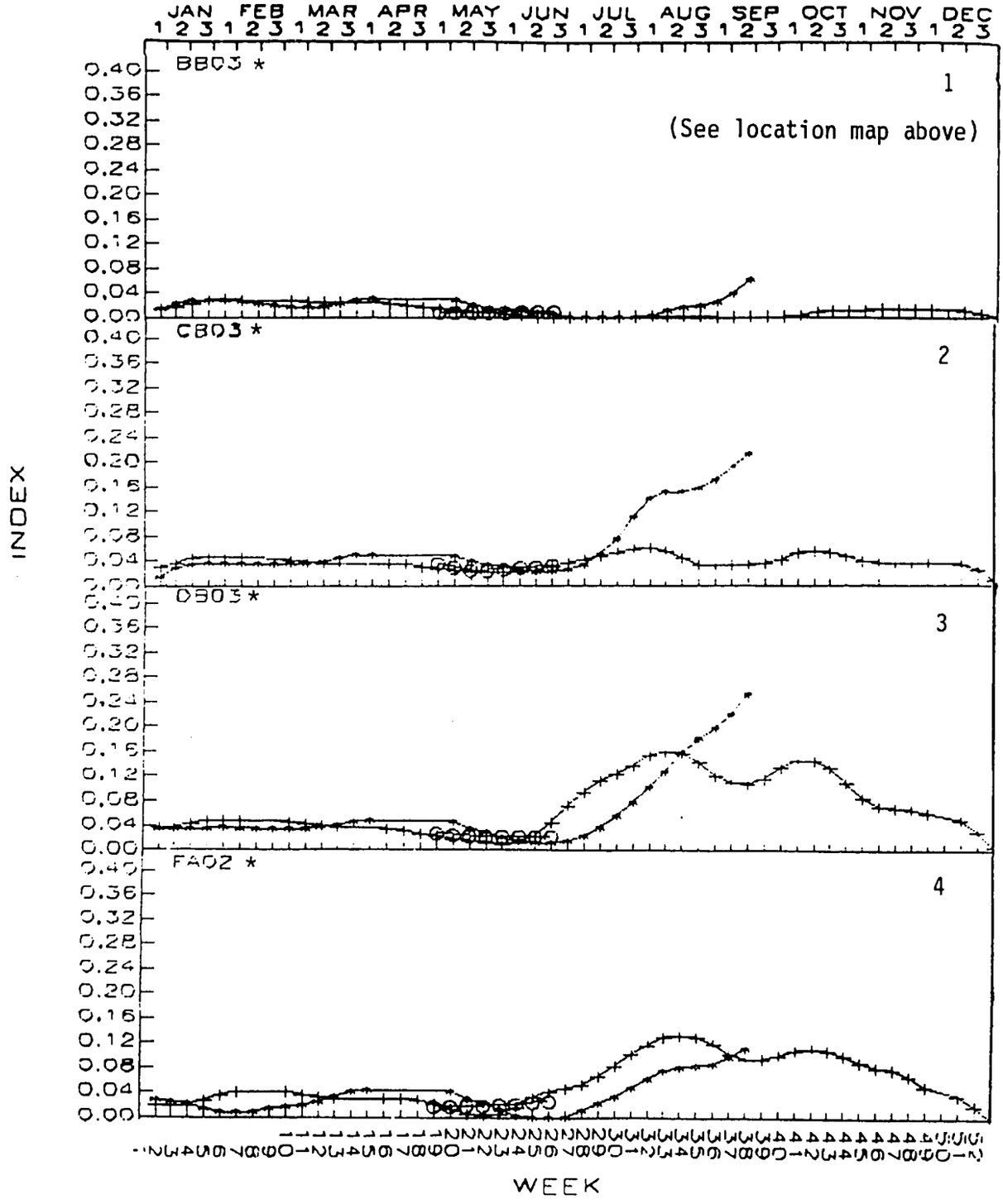
SENEGAL



NORMALIZED VEGETATION INDEX
TIME SERIES
(SELECT GRIDS)
SENEGAL

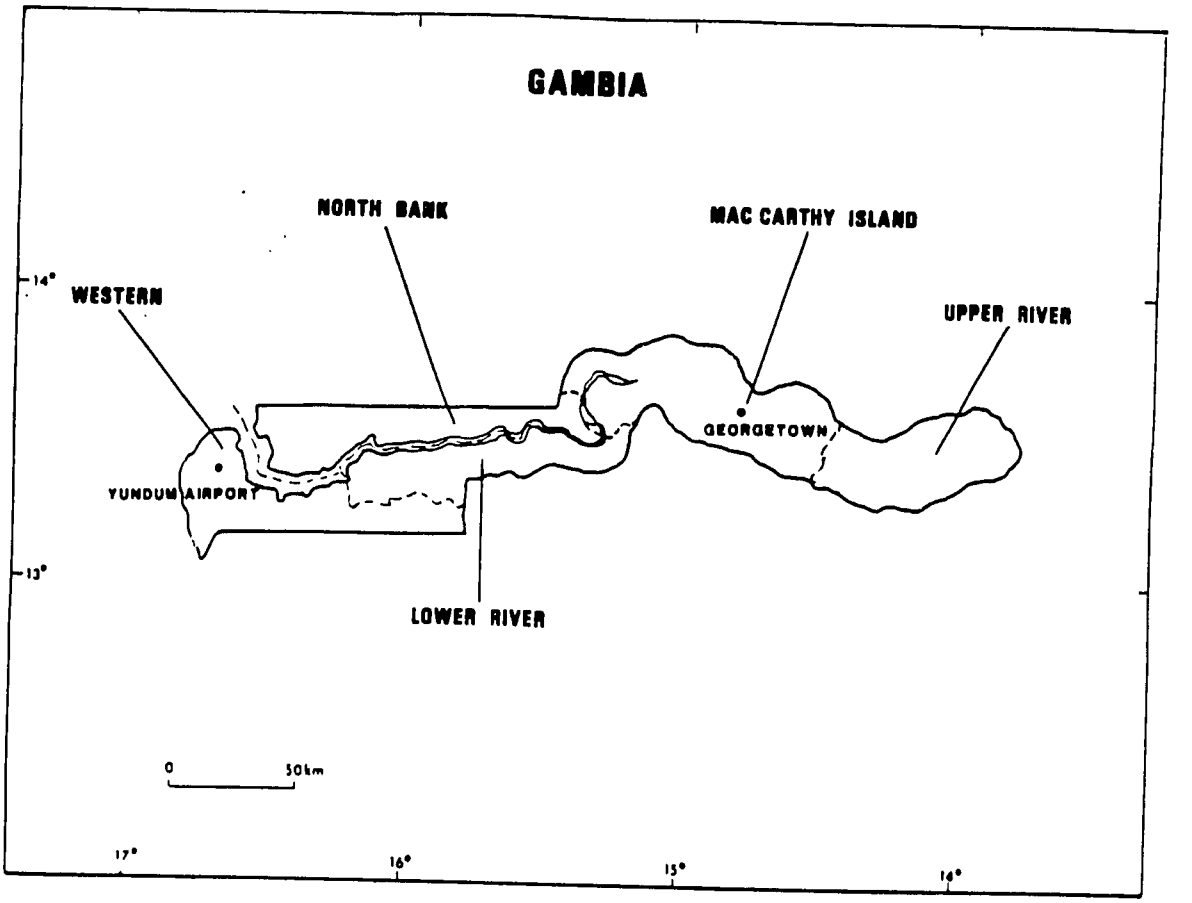
+ = 1984
* = 1985
O = 1986





*NOTE: These grid indicators match NVI grid indicators.

GAMBIA ASSESSMENT



* Crops and pastures got off to a late start but a good harvest is possible if regular rains persist through September.

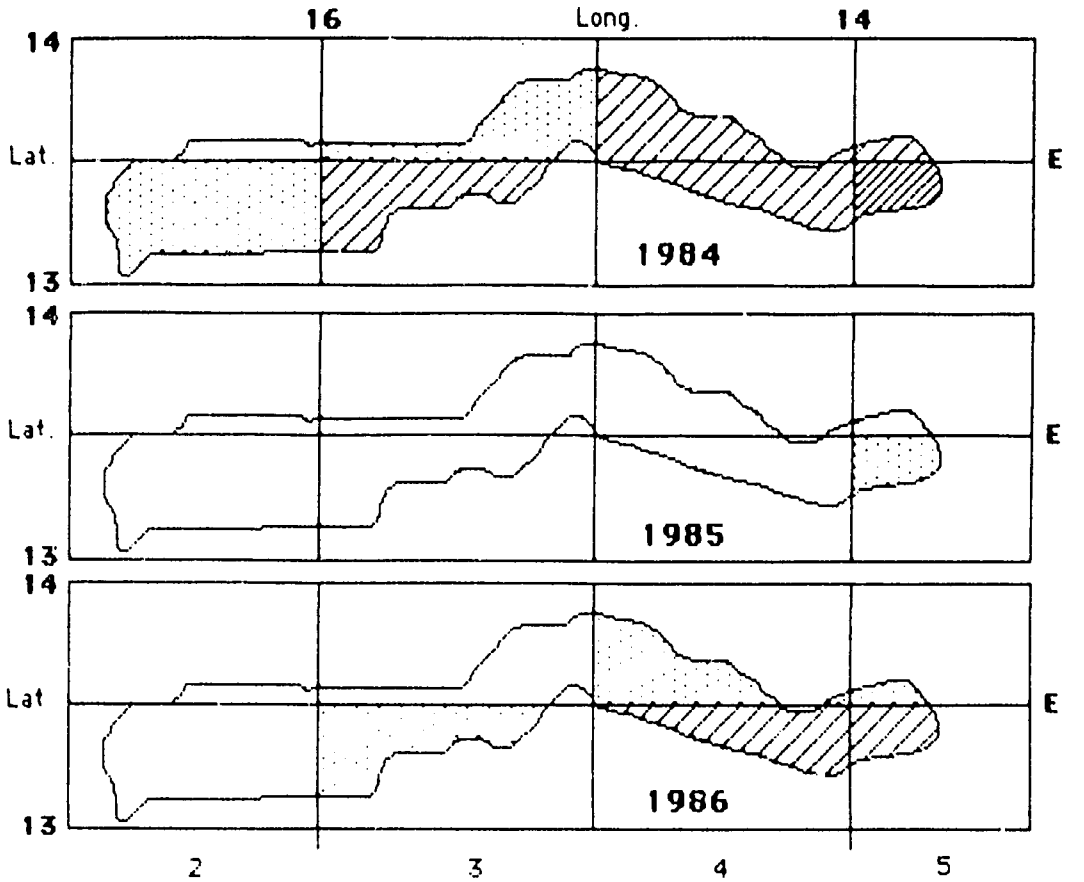
* June rainfall was less than 50 percent of normal and mainly limited to the southeast. Accordingly, "greenup" is evident in the southeast (see NVI data), with little or none elsewhere.

* Vegetation conditions tend to be better than last year in the south but worse than two years ago everywhere.

NOAA SATELLITE NORMALIZED VEGETATION INDEX

THIRD WEEK OF JUNE

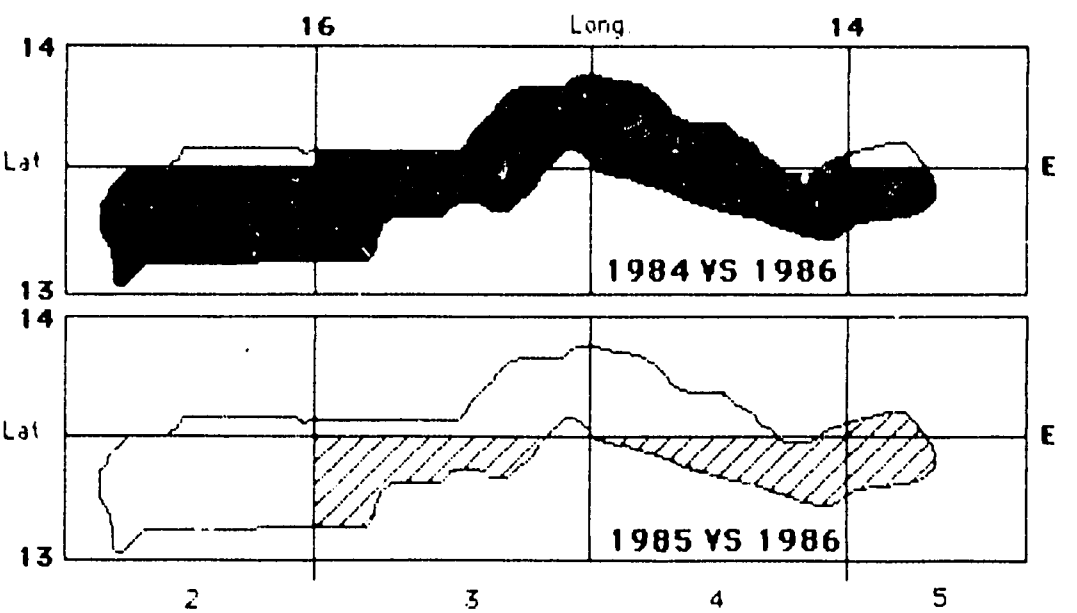
THE GAMBIA



NORMALIZED VEGETATION INDEX SCALE

0 025 05 10 15 20 25

DECREASING ← **VEGETATION** → INCREASING



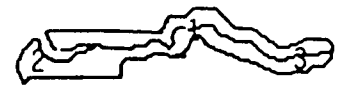
1986 LESS GREEN THAN PREVIOUS YEAR

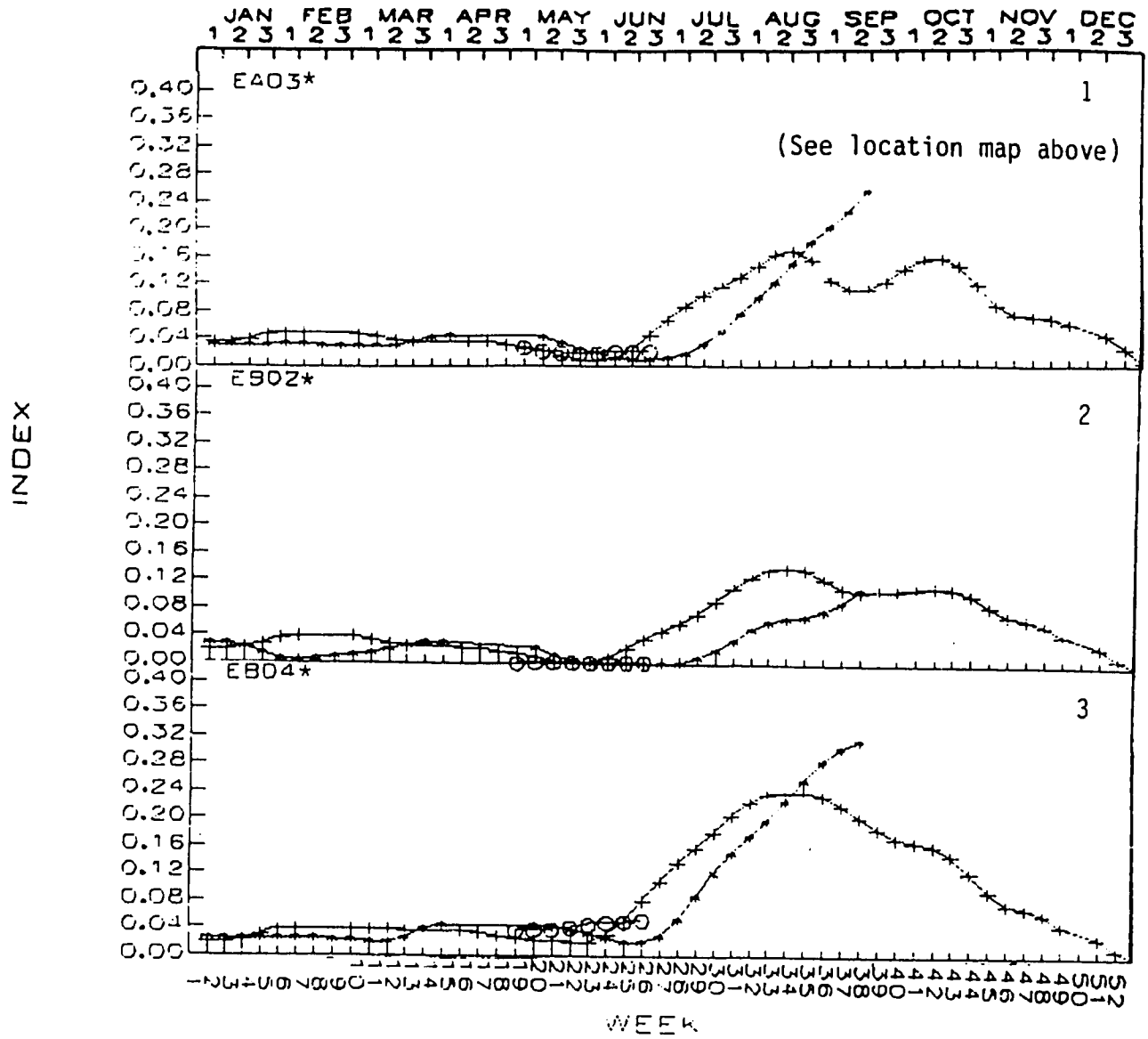
NO DIFFERENCE FROM PREVIOUS YEAR

1986 GREENER THAN PREVIOUS YEAR

NORMALIZED VEGETATION INDEX
TIME SERIES
(SELECT GRIDS)
GAMBIA

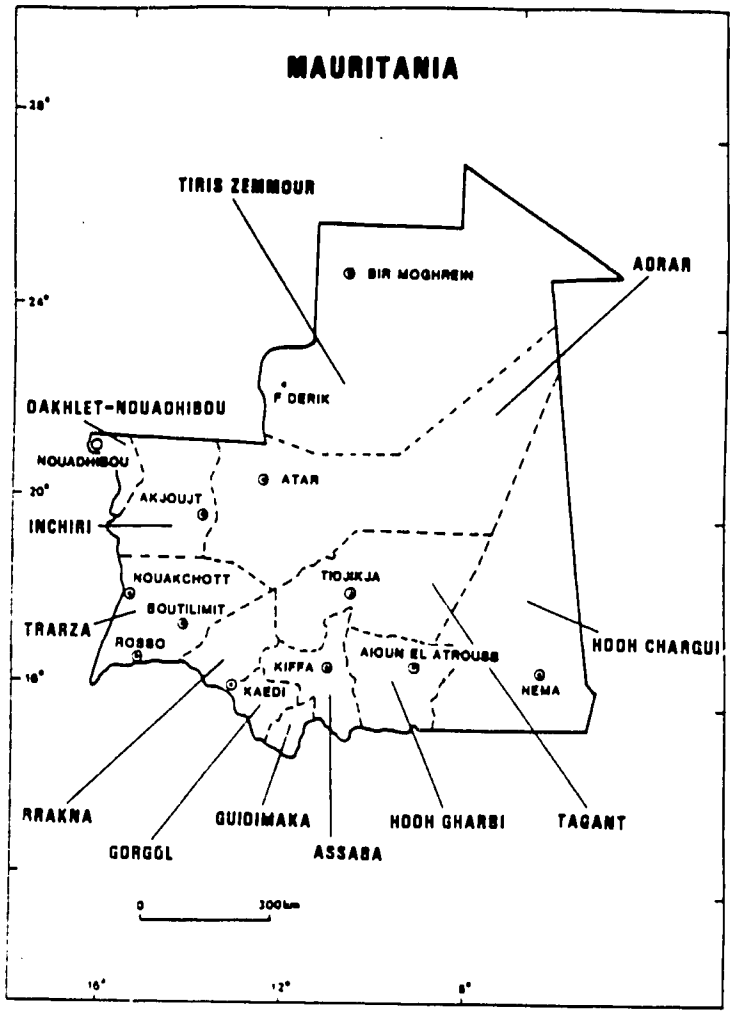
+ = 1984
• = 1985
O = 1986





*NOTE: These grid indicators match NVI grid indicators.

MAURITANIA ASSESSMENT



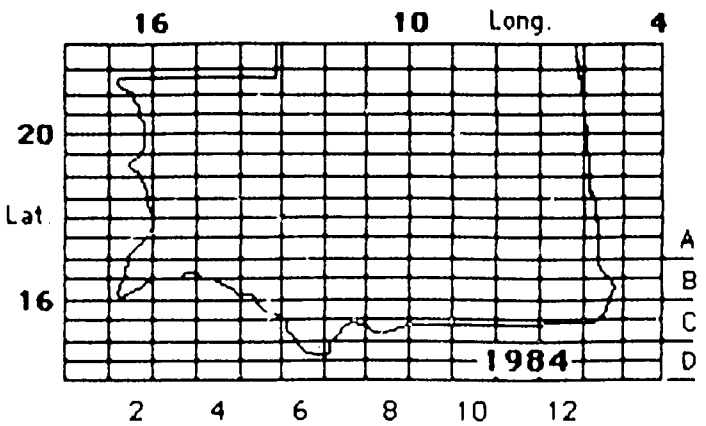
* Mauritania was seasonably dry. Light rains beginning at the end of June in south-central Mauritania favored planting of cereals.

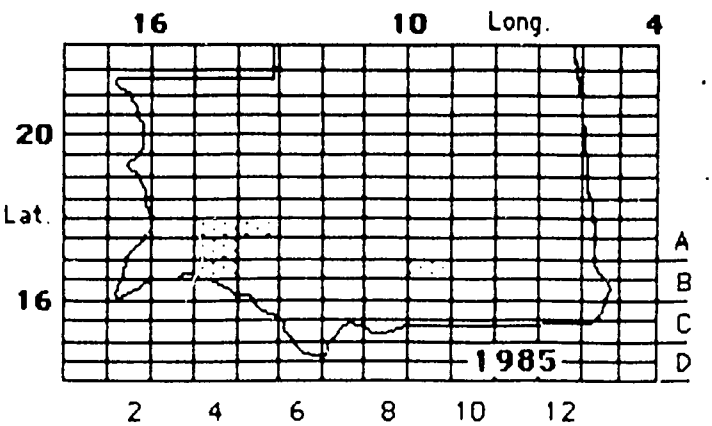
* Satellite data (see NVI maps and time series) suggest that vegetation in June was somewhat more advanced this year than in the preceding two years.

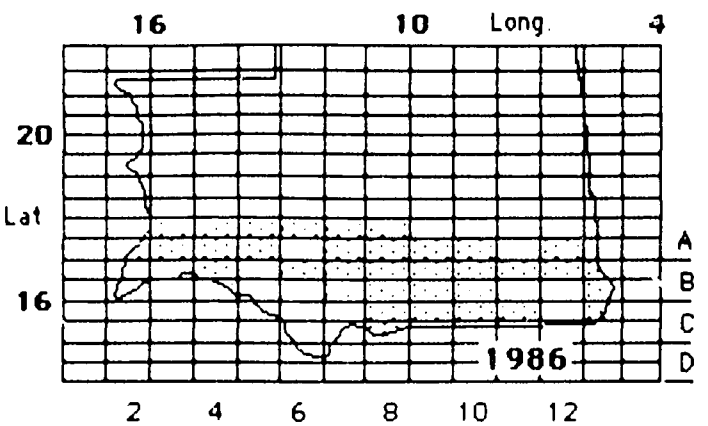
NOAA SATELLITE NORMALIZED VEGETATION INDEX

THIRD WEEK OF JUNE

MAURITANIA



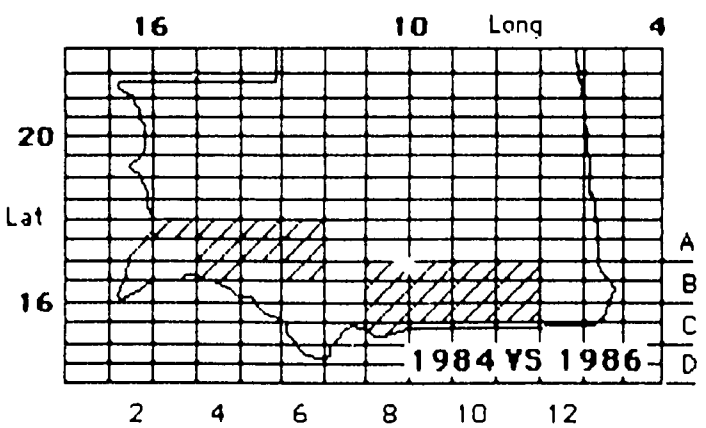


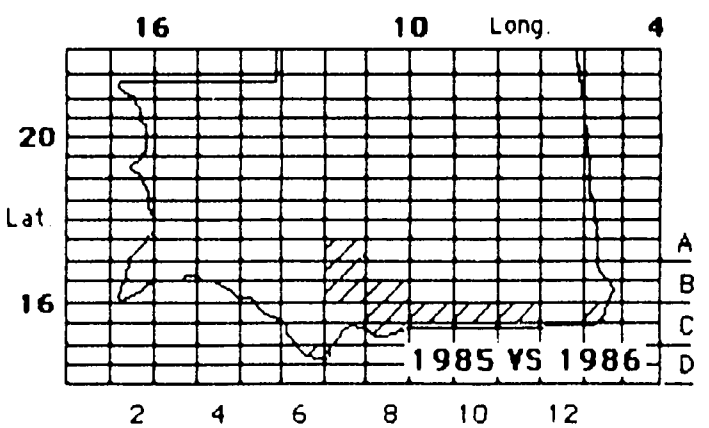


NORMALIZED VEGETATION INDEX SCALE

0 025 .05 .10 .15 .20 .25

DECREASING ⟵ **VEGETATION** ⟶ INCREASING





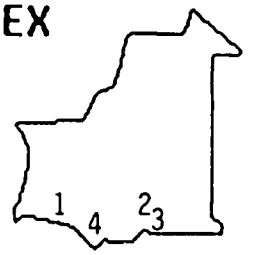
1986 LESS GREEN THAN PREVIOUS YEAR

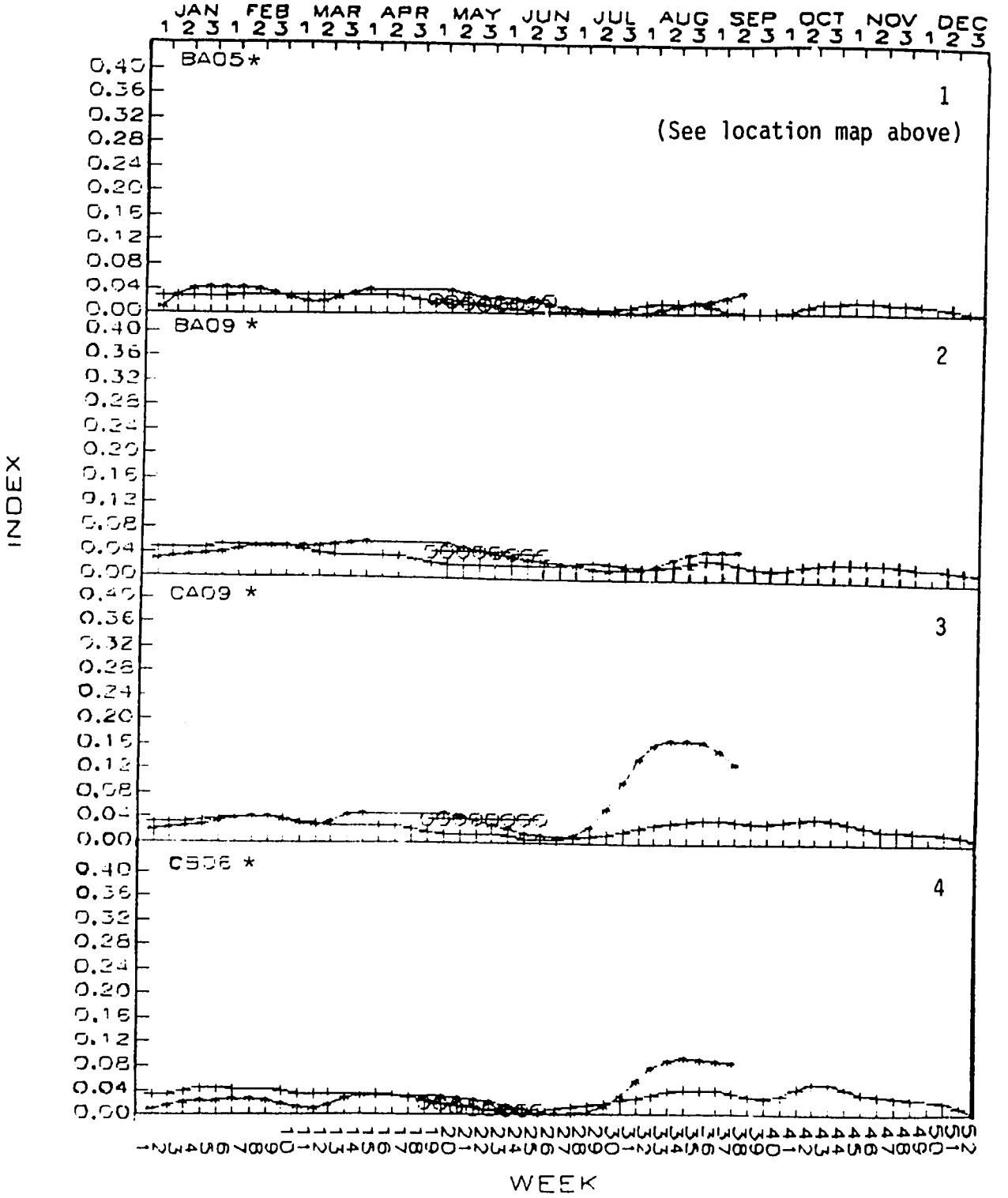
NO DIFFERENCE FROM PREVIOUS YEAR

1986 GREENER THAN PREVIOUS YEAR

NORMALIZED VEGETATION INDEX
TIME SERIES
(SELECT GRIDS)
MAURITANIA

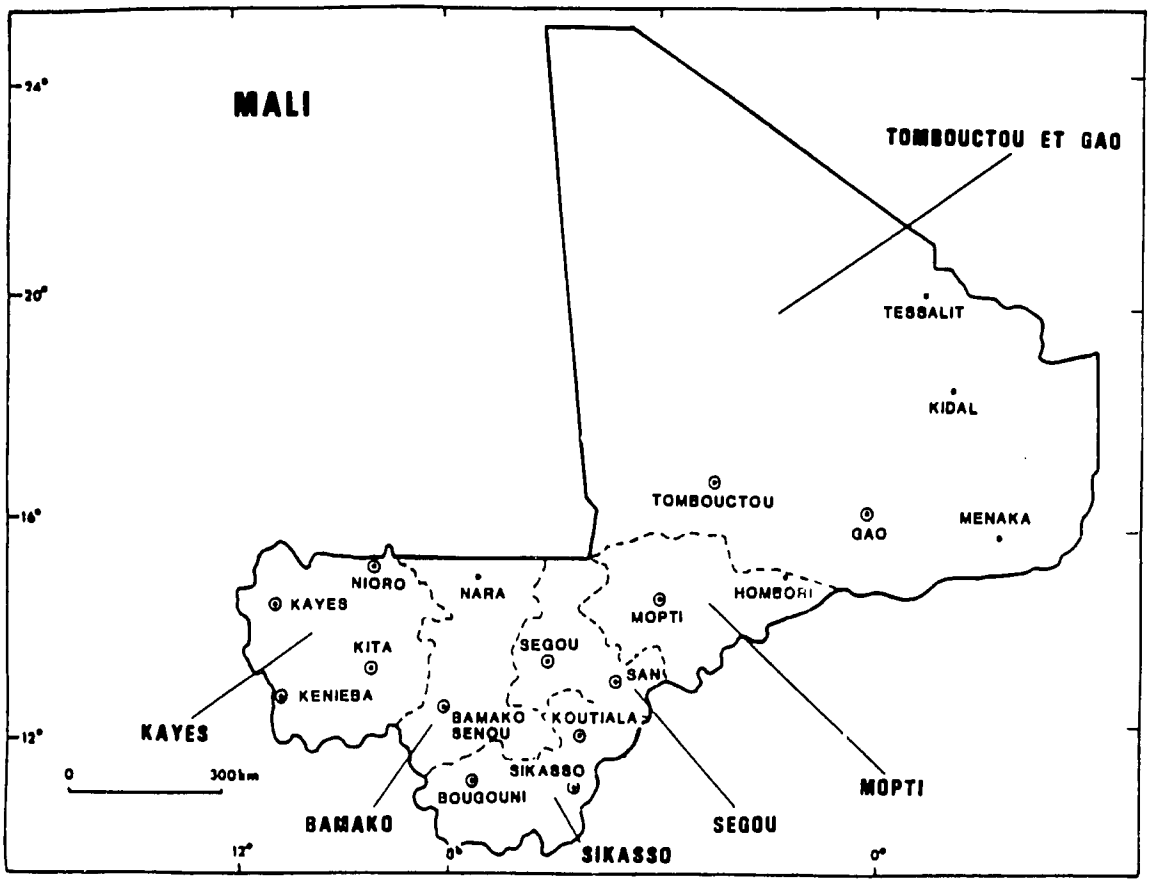
+ = 1984
* = 1985
O = 1986





*NOTE: These grid indicators match NVI grid indicators.

MALI ASSESSMENT



* In Mali, crops and rangelands are in better condition than in either of the past two years but grasshoppers are becoming a problem. Near or above-normal June rainfall favored early crop and pasture growth. The rains moved northward into northern Kayes, Bamako, and Mopti regions during June and should progress northward into Timbuktu and Gao in early July. Vegetation growth has been better than in the preceding two years, especially in southern Sikasso. In Kayes, humid weather reportedly triggered the first outbreak of grasshoppers.

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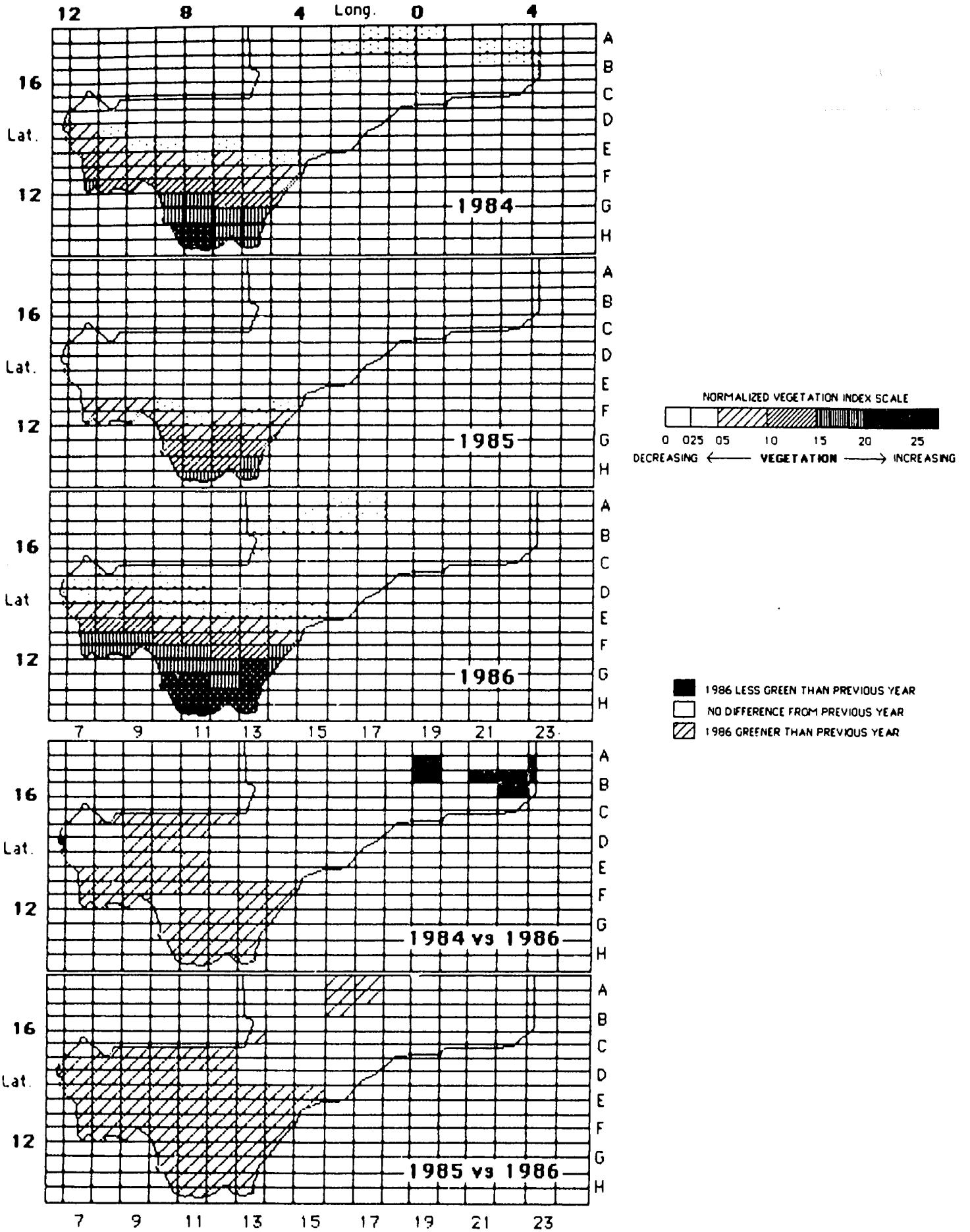
NOAA SATELLITE NORMALIZED VEGETATION INDEX

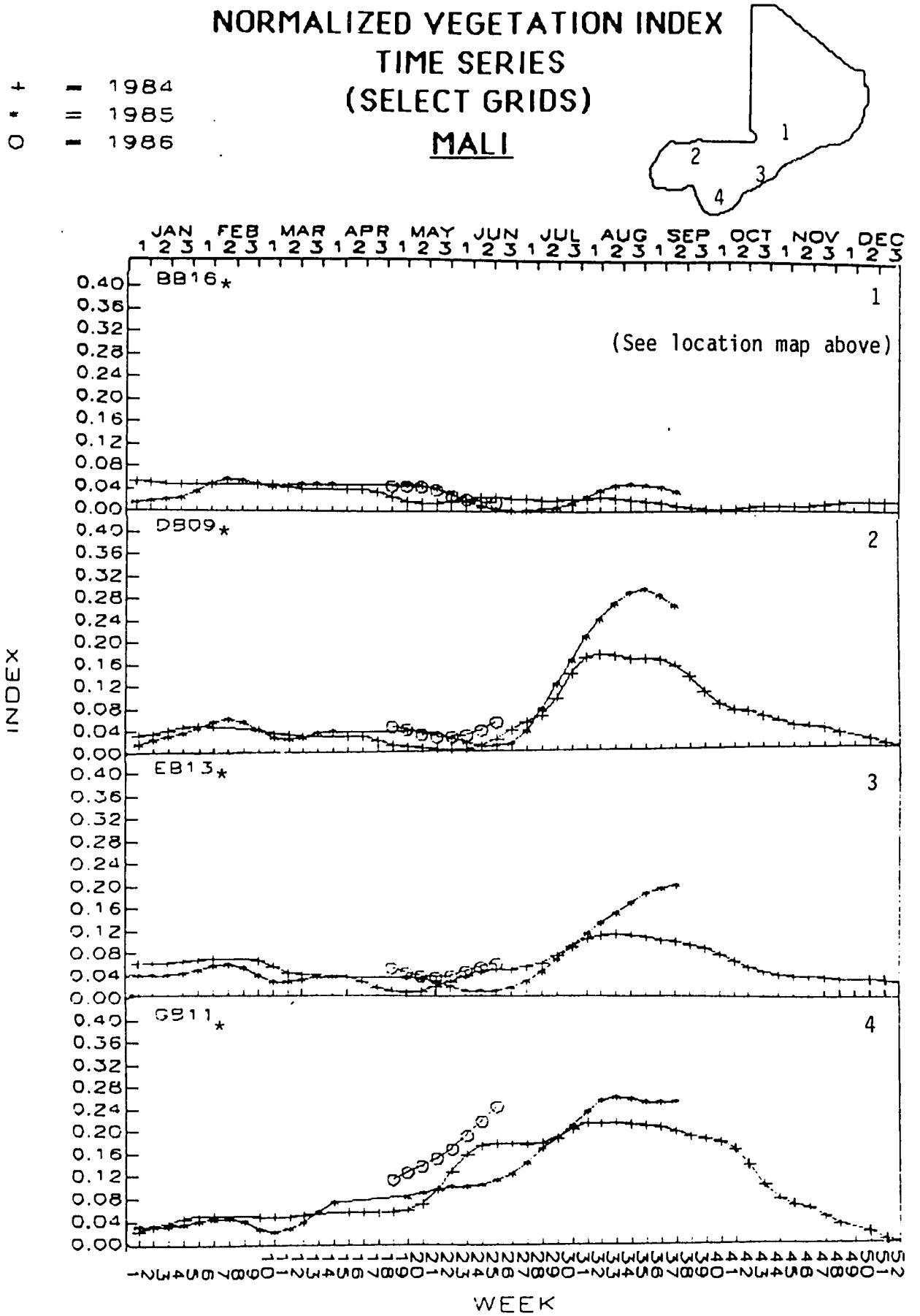
THIRD WEEK OF JUNE

MALI



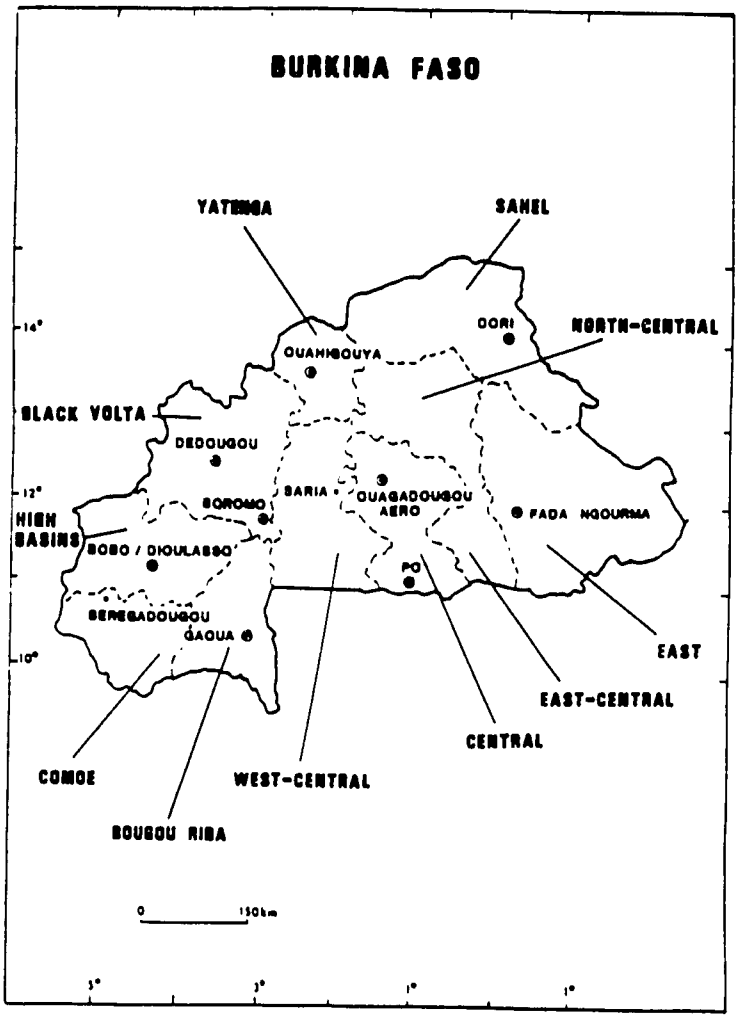
NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

MALI



*NOTE: These grid indicators match NVI grid indicators.

BURKINA FASO ASSESSMENT



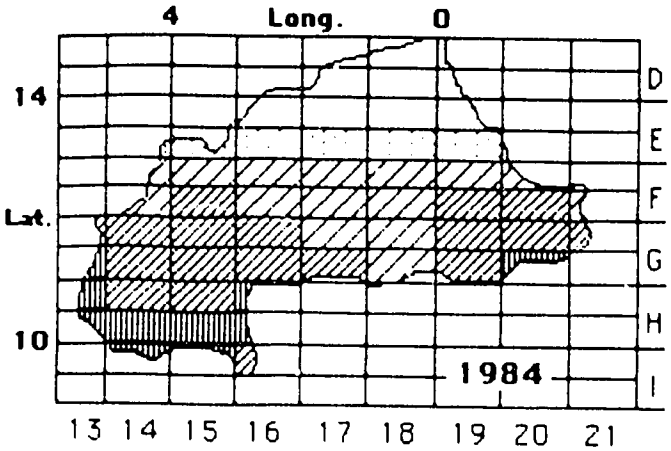
* Crops and pastures are in good shape. Due to widespread, regular showers, crop and pasture growth has been above average. Conditions are especially good in the southwest, where abundant rains fell at the end of May and in the first three weeks of June. Pockets of low vegetation index were located in the Central, East, and East Central regions during June. Abundant soil moisture in May favored early cereal planting but increased the potential for locust problems.

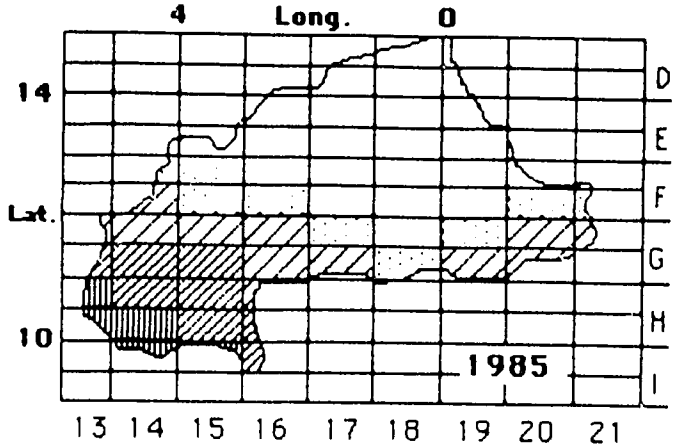
* NVI data indicate that vegetation is well ahead of last year everywhere except in the north (see NVI maps and time series). In the east, vegetation lags behind 1984.

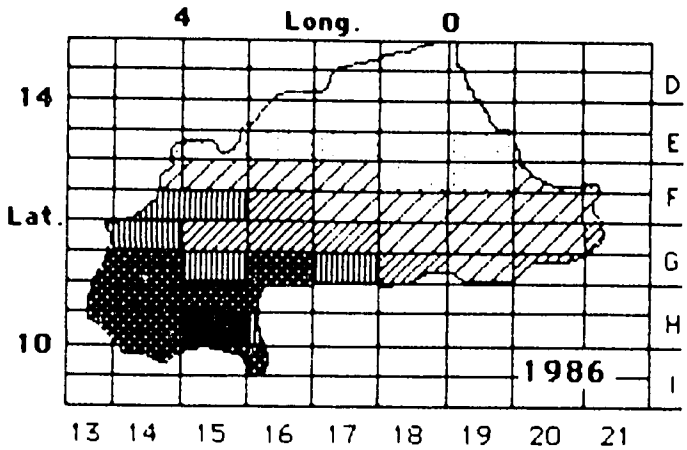
NOAA SATELLITE NORMALIZED VEGETATION INDEX

THIRD WEEK OF JUNE

BURKINA FASO



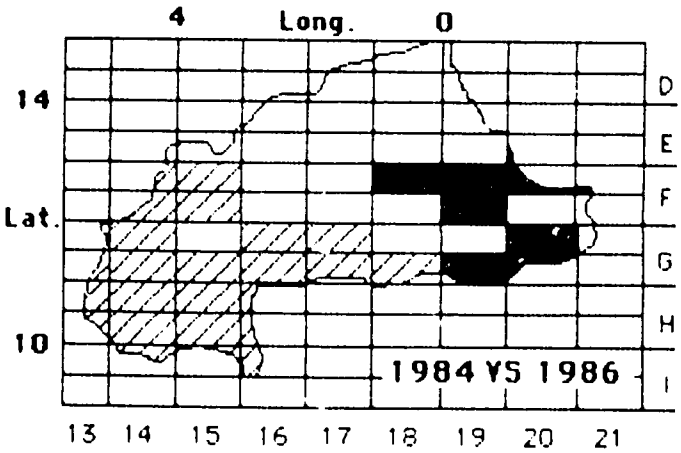


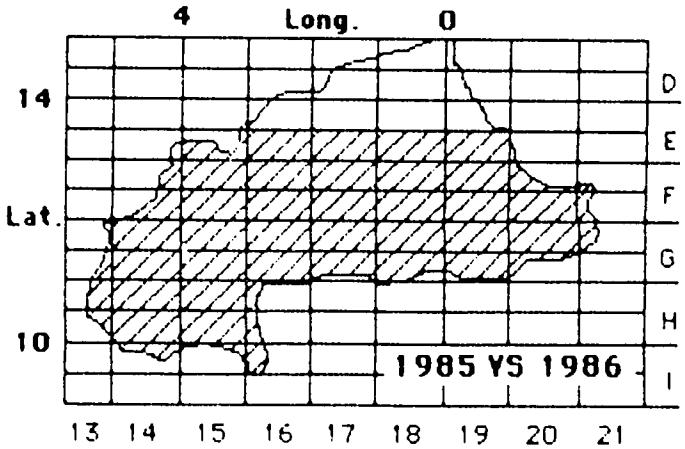


NORMALIZED VEGETATION INDEX SCALE

0 025 05 10 15 20 .25

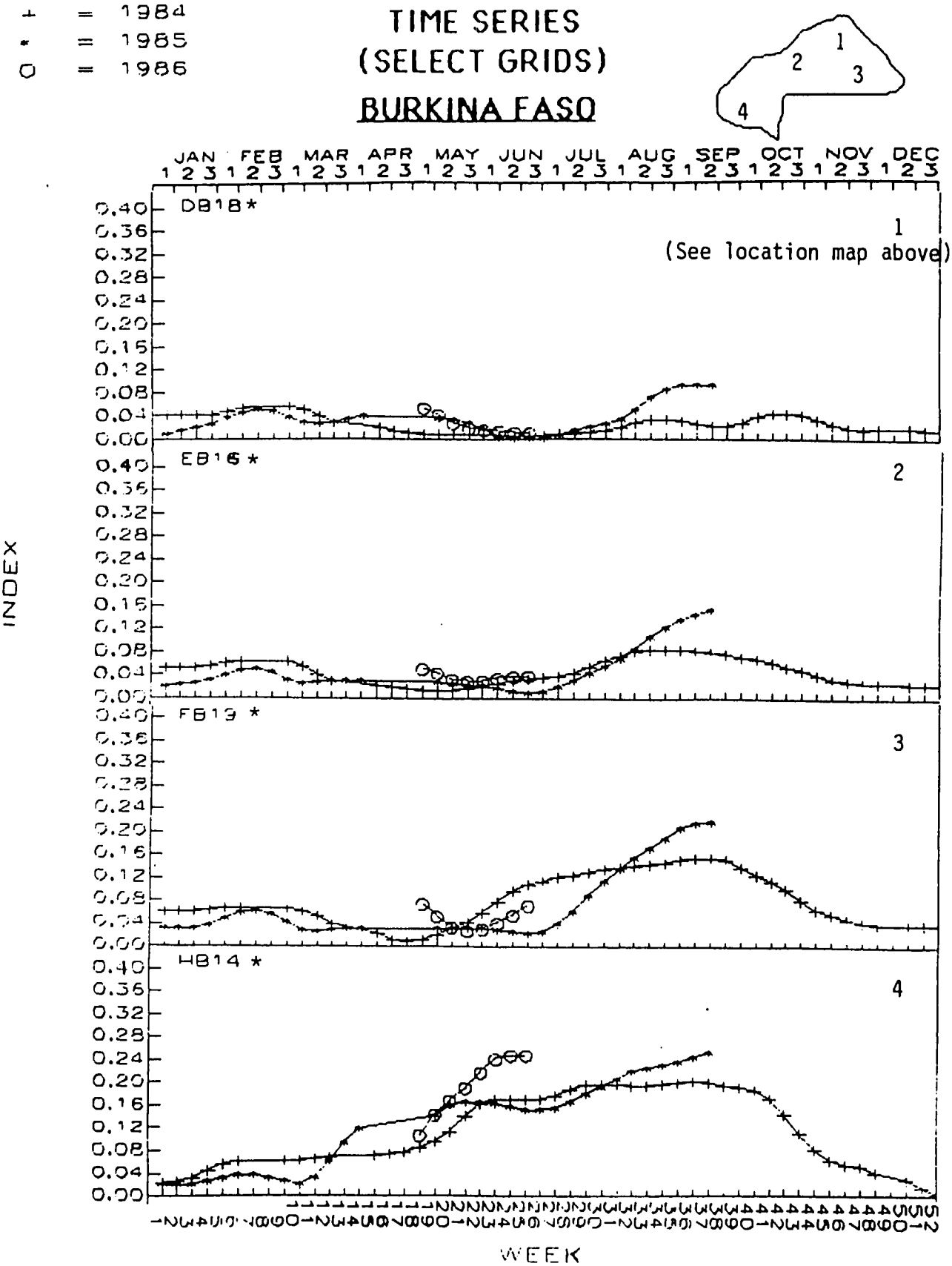
DECREASING ⟵ **VEGETATION** ⟶ INCREASING





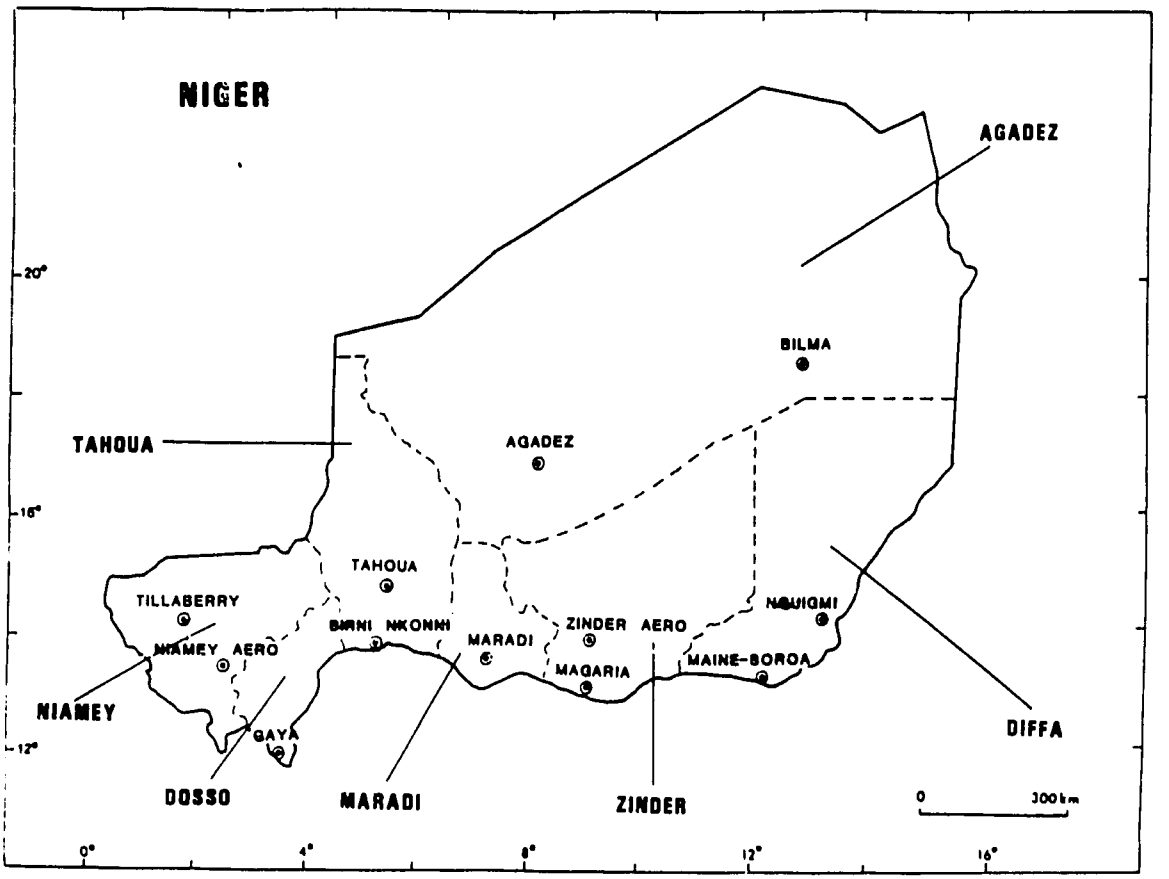
- 1986 LESS GREEN THAN PREVIOUS YEAR
- NO DIFFERENCE FROM PREVIOUS YEAR
- 1986 GREENER THAN PREVIOUS YEAR

NORMALIZED VEGETATION INDEX
TIME SERIES
(SELECT GRIDS)
BURKINA FASO



*NOTE: These grid indicators match NVI grid indicators.

NIGER ASSESSMENT



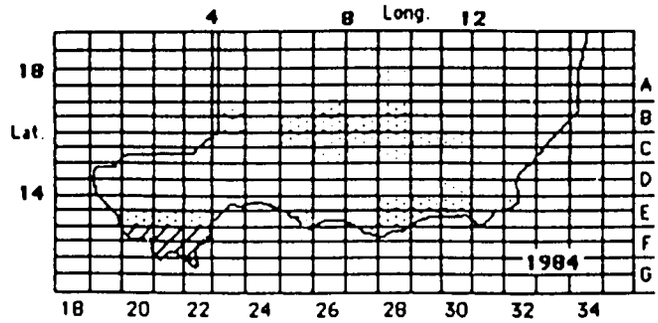
* Planting is late but has now started. Scattered showers finally permitted crop planting in the east (Zinder and Diffa) during the last 10 days of June. More frequent rains fell in western areas during the month. Although monthly totals were below normal, the moisture benefitted planting of maize, sorghum, and millet.

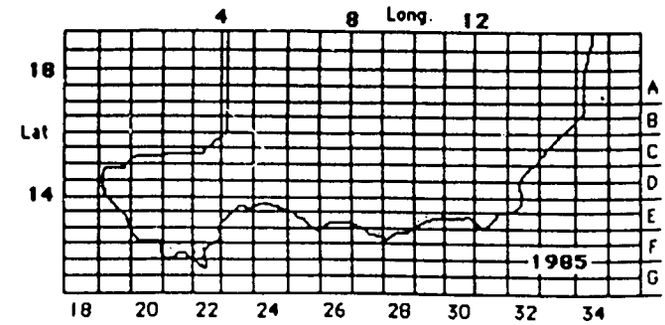
* Though vegetation growth is minimal (see NVI maps and time series), it is more advanced than in 1985 in much of the south and slightly more advanced than in 1984 in parts of the east. Growth is somewhat more retarded than in 1984 in the southwest.

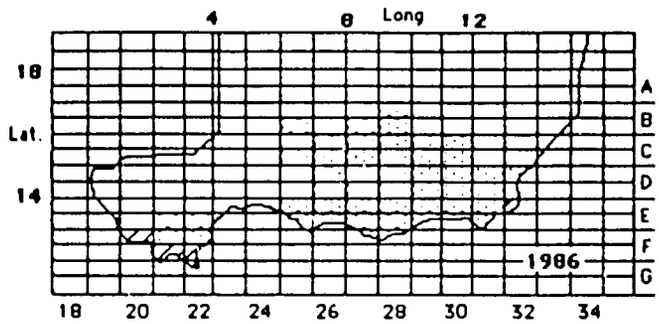
NOAA SATELLITE NORMALIZED VEGETATION INDEX

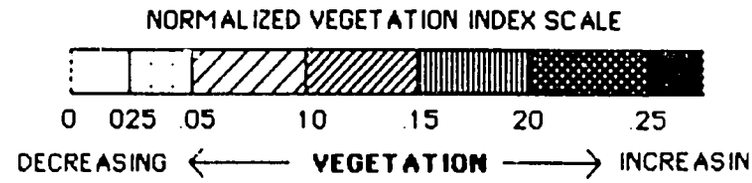
THIRD WEEK OF JUNE

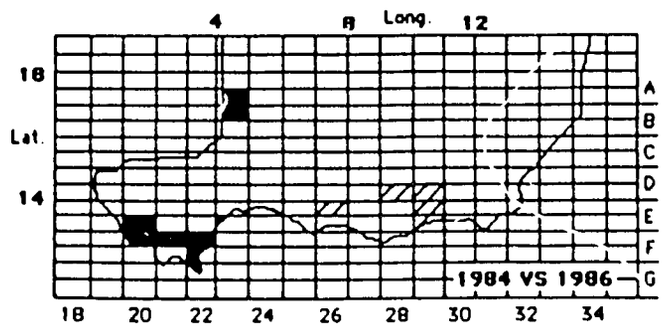
NIGER

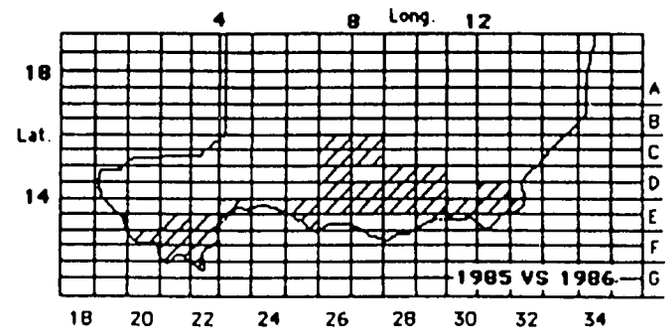












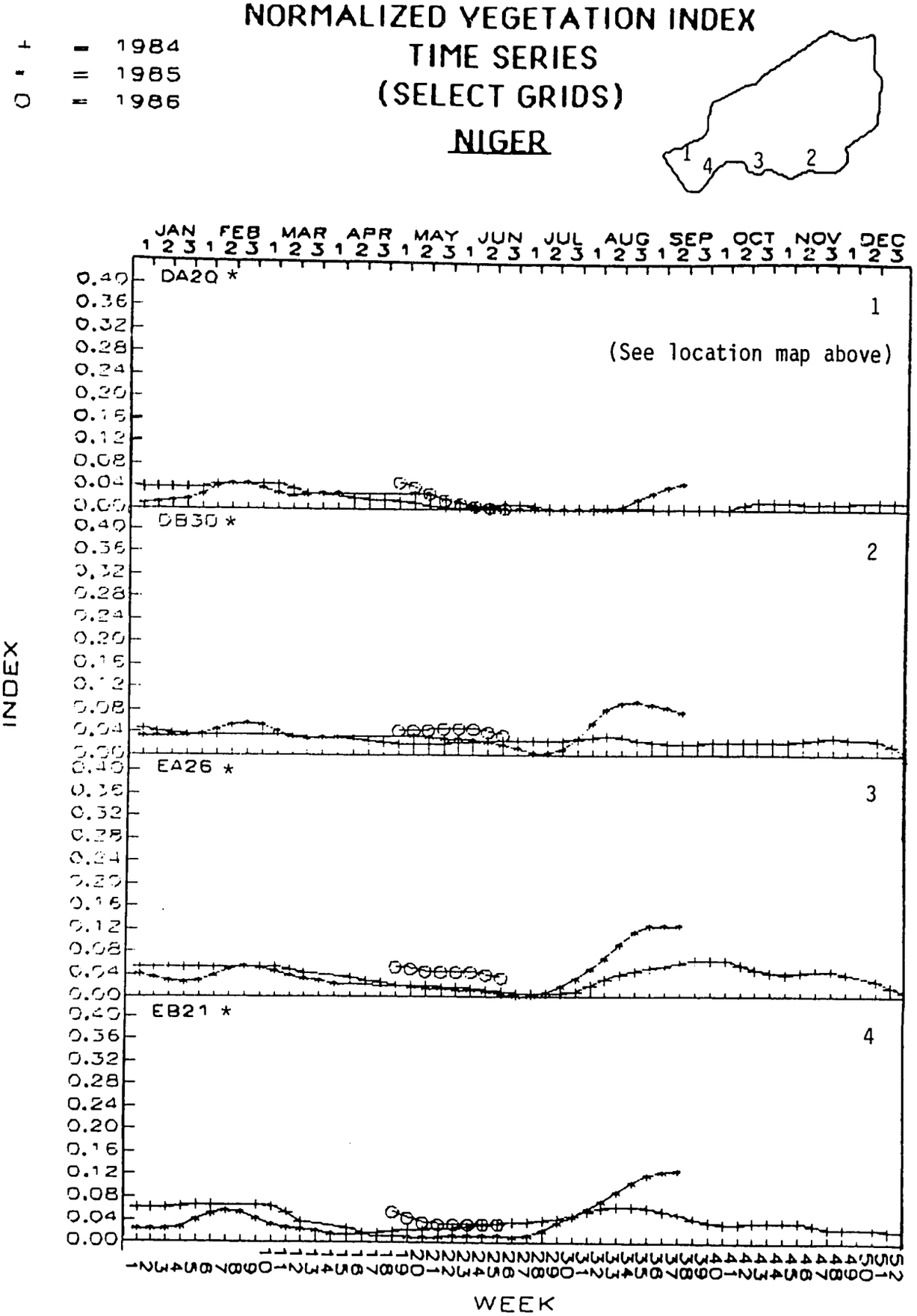
1986 LESS GREEN THAN PREVIOUS YEAR

NO DIFFERENCE FROM PREVIOUS YEAR

1986 GREENER THAN PREVIOUS YEAR

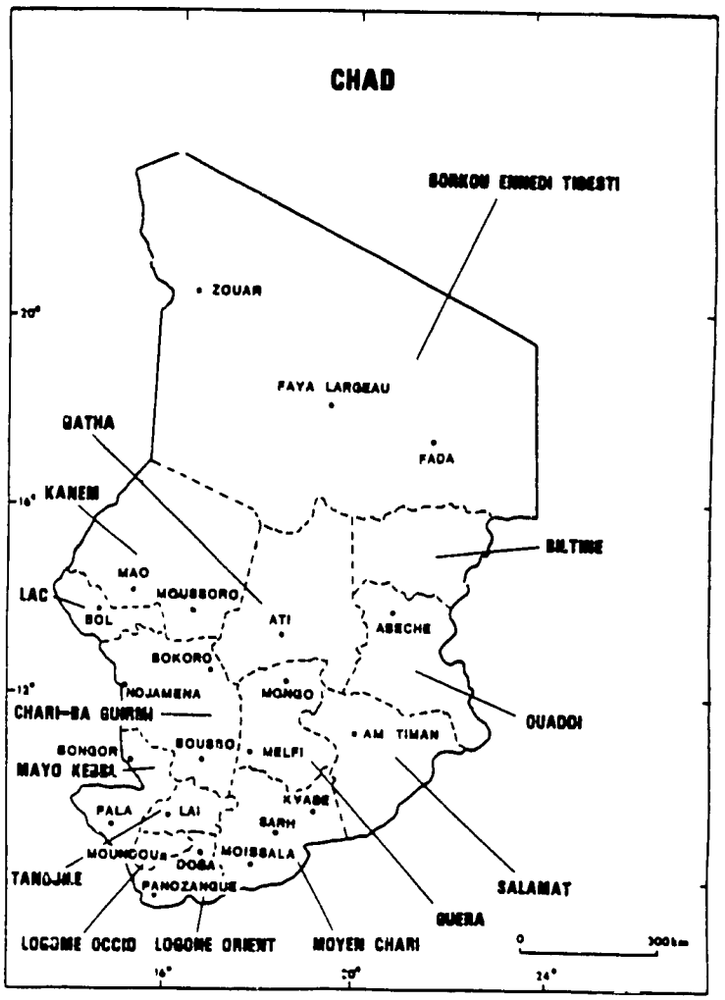
NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

NIGER



*NOTE: These grid indicators match NVI grid indicators.

CHAD ASSESSMENT



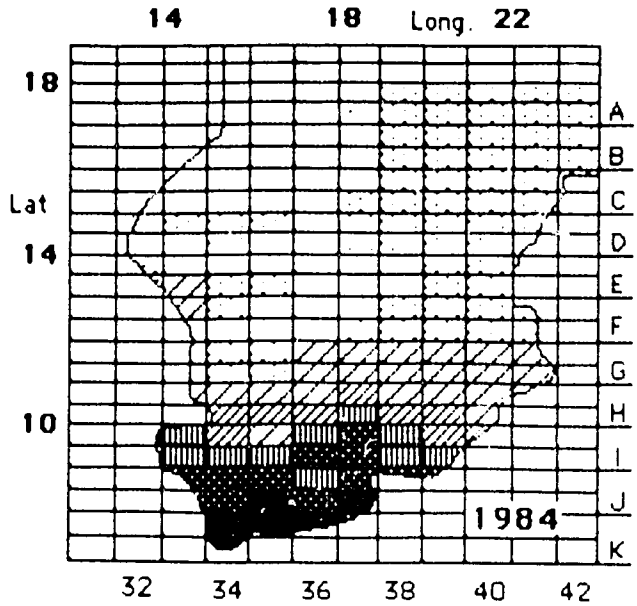
* In Chad, conditions are worse than last year in the south, but permanent damage has not yet been done. Increasing rainfall during June, especially in the last 10 days, relieved dryness in southern Chad. Though June crop and pasture conditions were worse than last year, continued rainfall would produce favorable harvests. An area of concern is in Moyen-Chari department, where vegetation growth was lower than in the previous two years. The driest area was south of Sarh and east of Moissala. Vegetation growth also lagged behind the last two years in eastern Logone Oriental. Continued rainfall is important in these areas. To the north, in the Sahel zone, conditions remained quite dry, but the planting season can extend until mid-July.

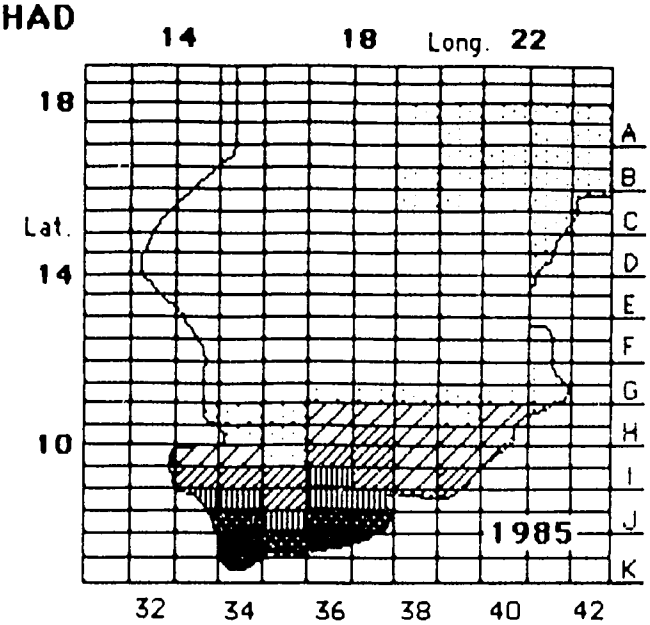
* Compared with 1984, vegetation growth is delayed across much of the south (see NVI maps and time series). Growth in the eastern Sahel is better than in both 1984 and 1985. Satellite imagery shows much greater growth in the Lake Chad basin this year than in the prior two years.

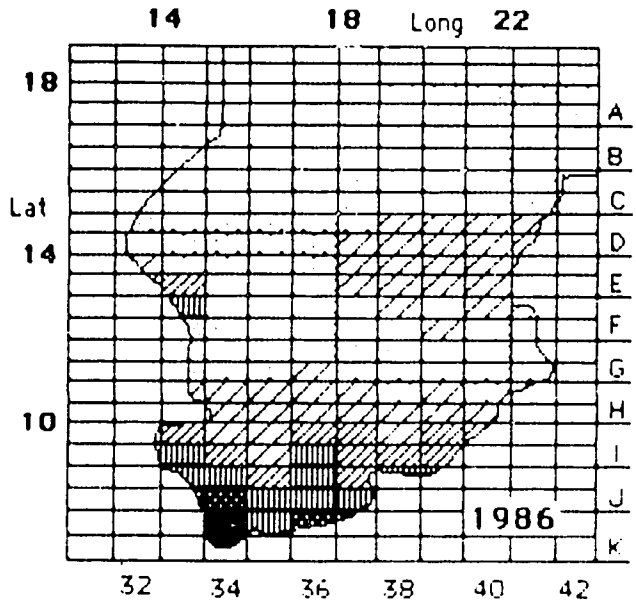
NOAA SATELLITE NORMALIZED VEGETATION INDEX

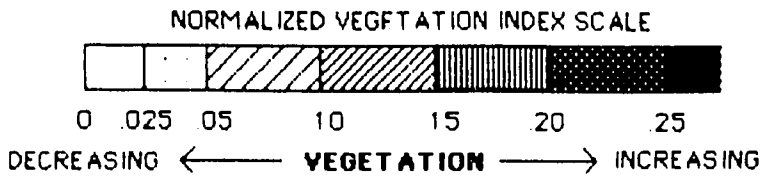
THIRD WEEK OF JUNE

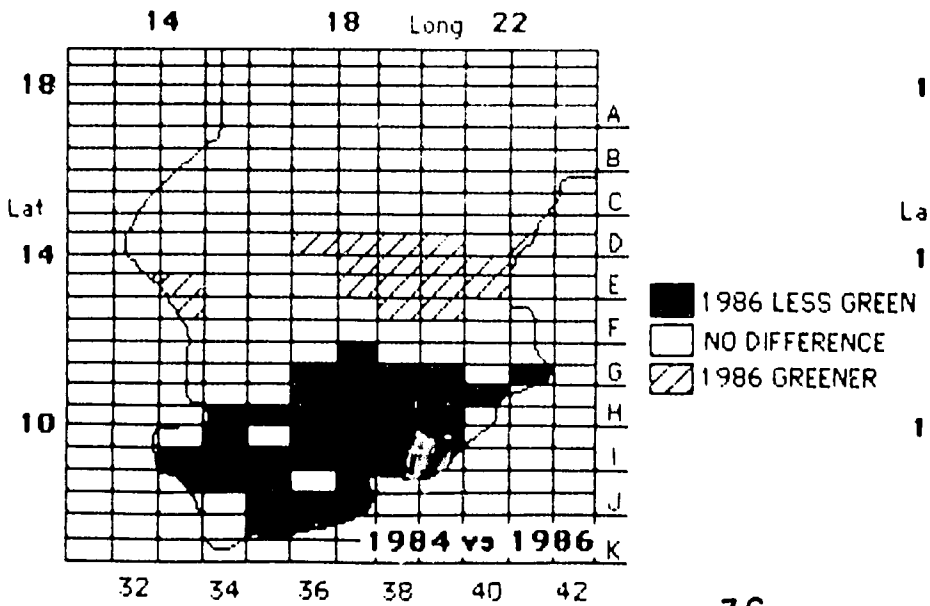
CHAD

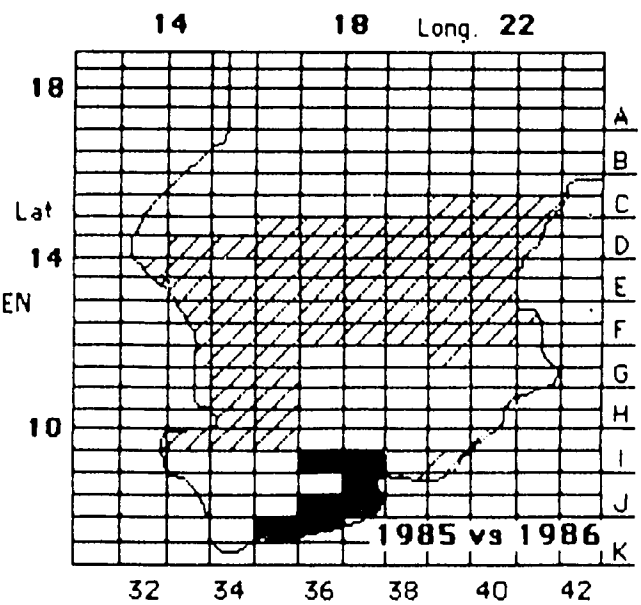






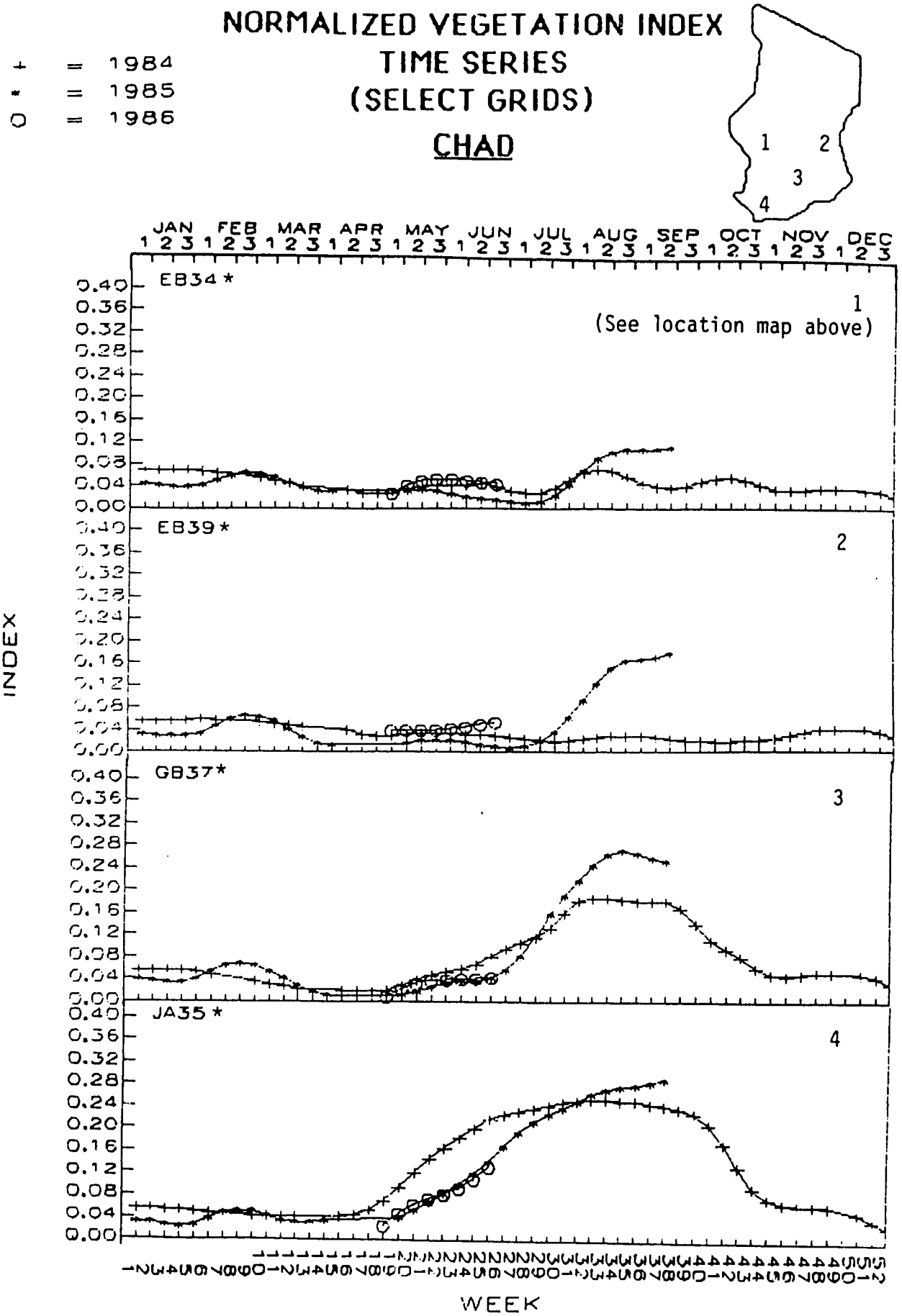






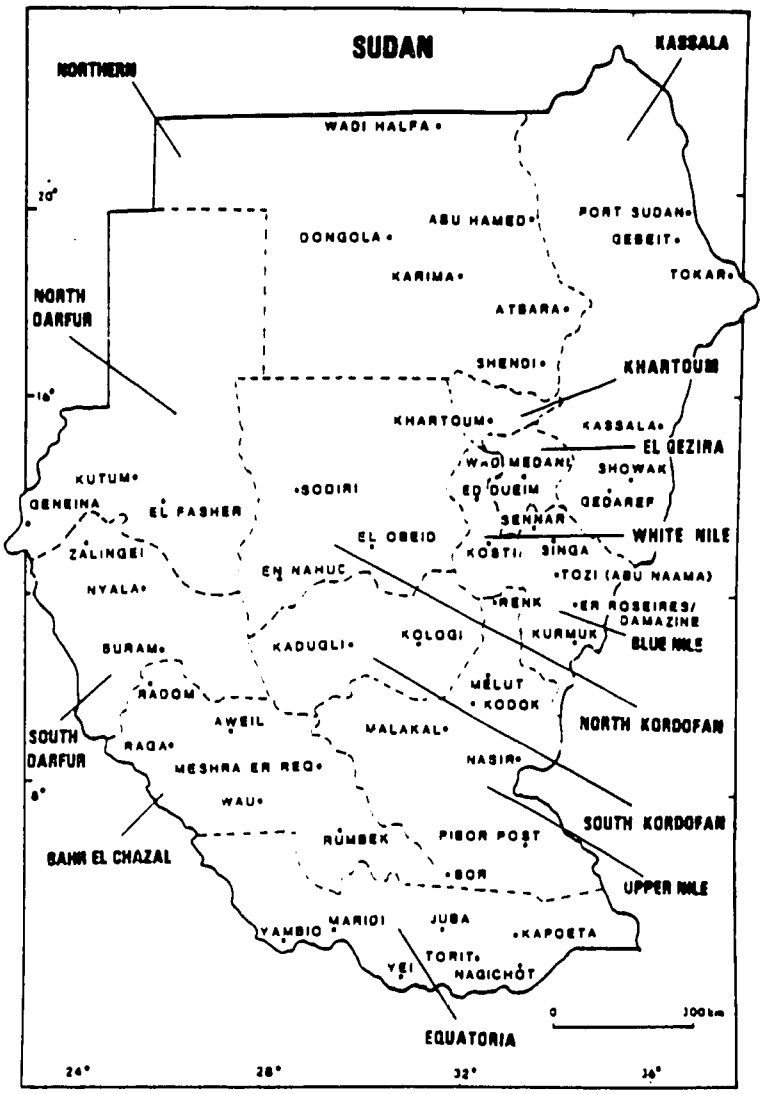
NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

CHAD



* NOTE: These grid indicators match NVI grid indicators.

SUDAN ASSESSMENT



* Increasing June rainfall favored early growth of sorghum and millet in mechanized farming areas of eastern Sudan (Kassala, Blue Nile, White Nile , though monthly rainfall was below normal in some areas. By early July the rainy season had begun in El Gezira and appeared to be underway in N. Kordofan and N. Darfur.

* Anomalous rainfall in Darfur and western parts of N. Kordofan during June produced vegetation growth better than in the preceding two years in many areas (see NVI maps and time series).

* June vegetation development in the south (Bahr El Ghazal, Upper Nile, Equatoria, southern Blue Nile, extreme south of Southern Kordofan) was well below normal, implying poor yield potential of May-planted crops and below-average pasture growth (see NVI maps and time series). Widespread showers the latter half of the month provided adequate growing conditions for June-planted crops.

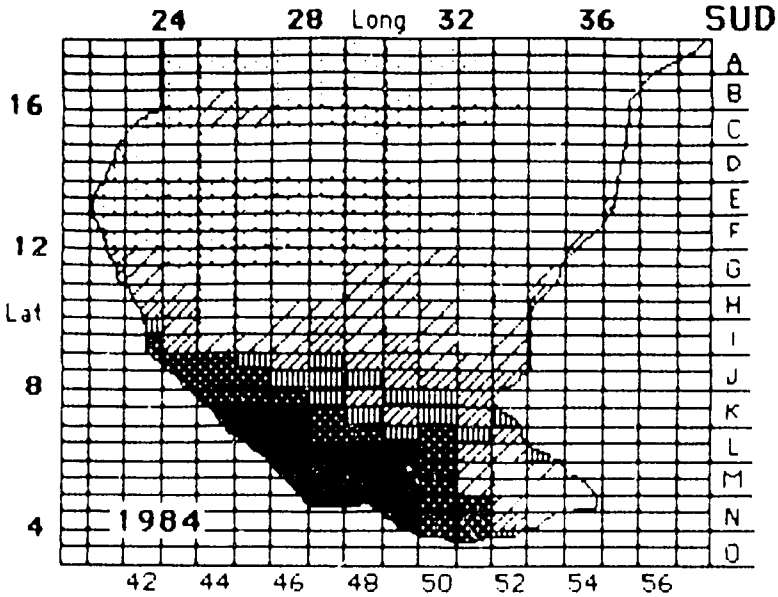
* Yield losses in the south should be mostly localized, as the bulk of the crop was probably planted (or re-planted) late enough to take advantage of heavier rains late June.

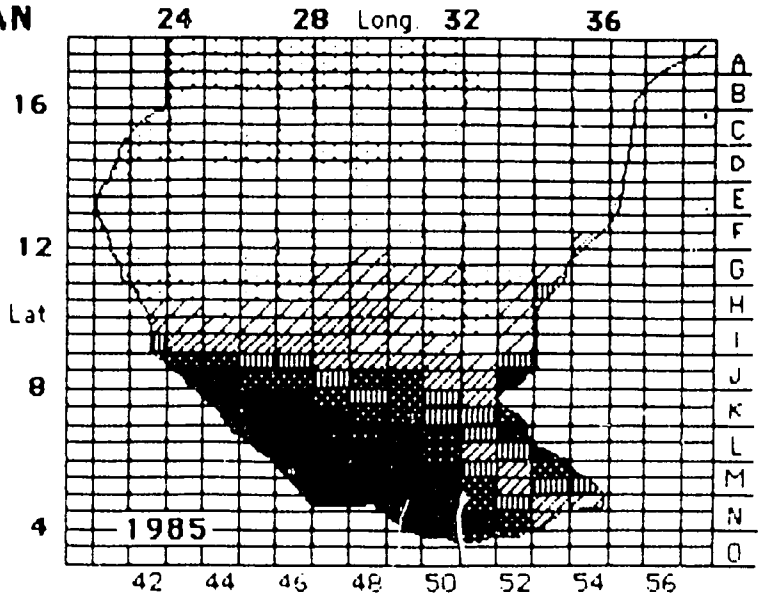
* Rainfall during late 1985 favored desert locust habitat in the coastal region. Kassala province is particularly vulnerable to desert locusts.

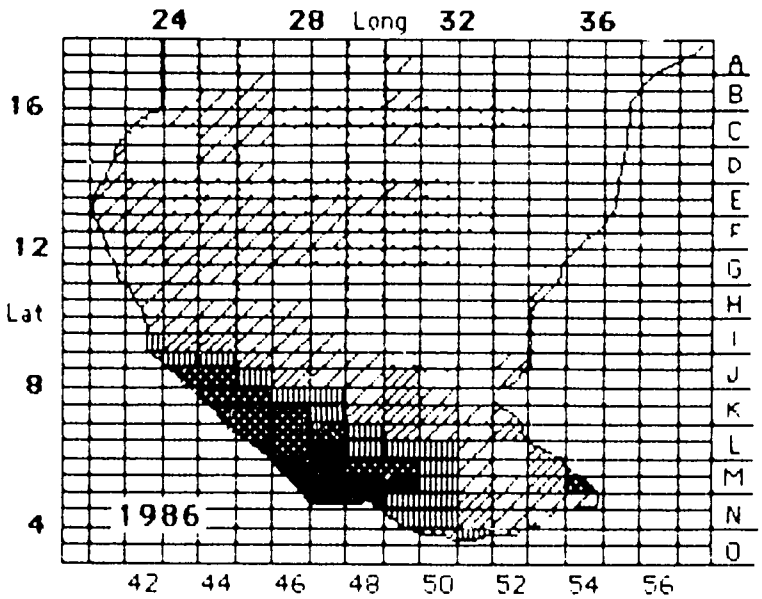
NOAA SATELLITE NORMALIZED VEGETATION INDEX

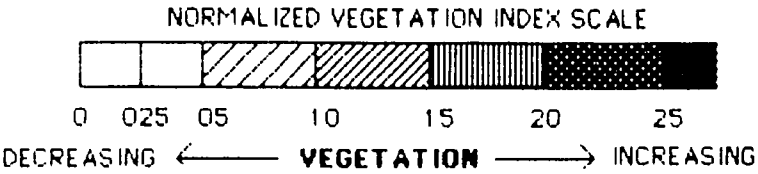
THIRD WEEK OF JUNE

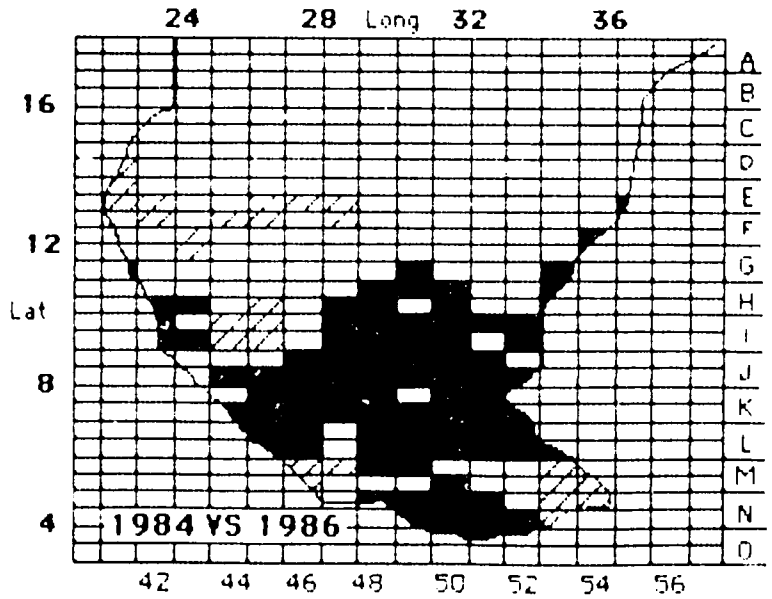
SUDAN

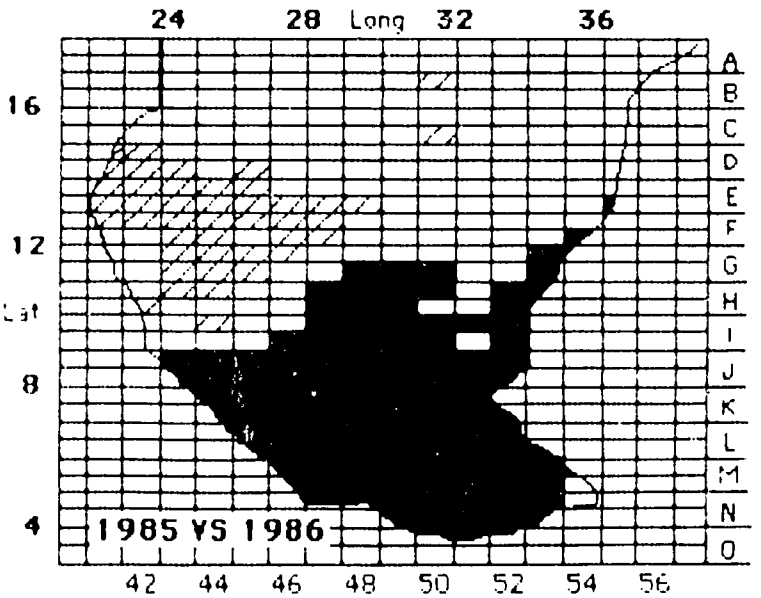










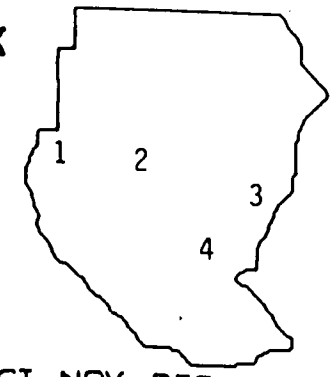


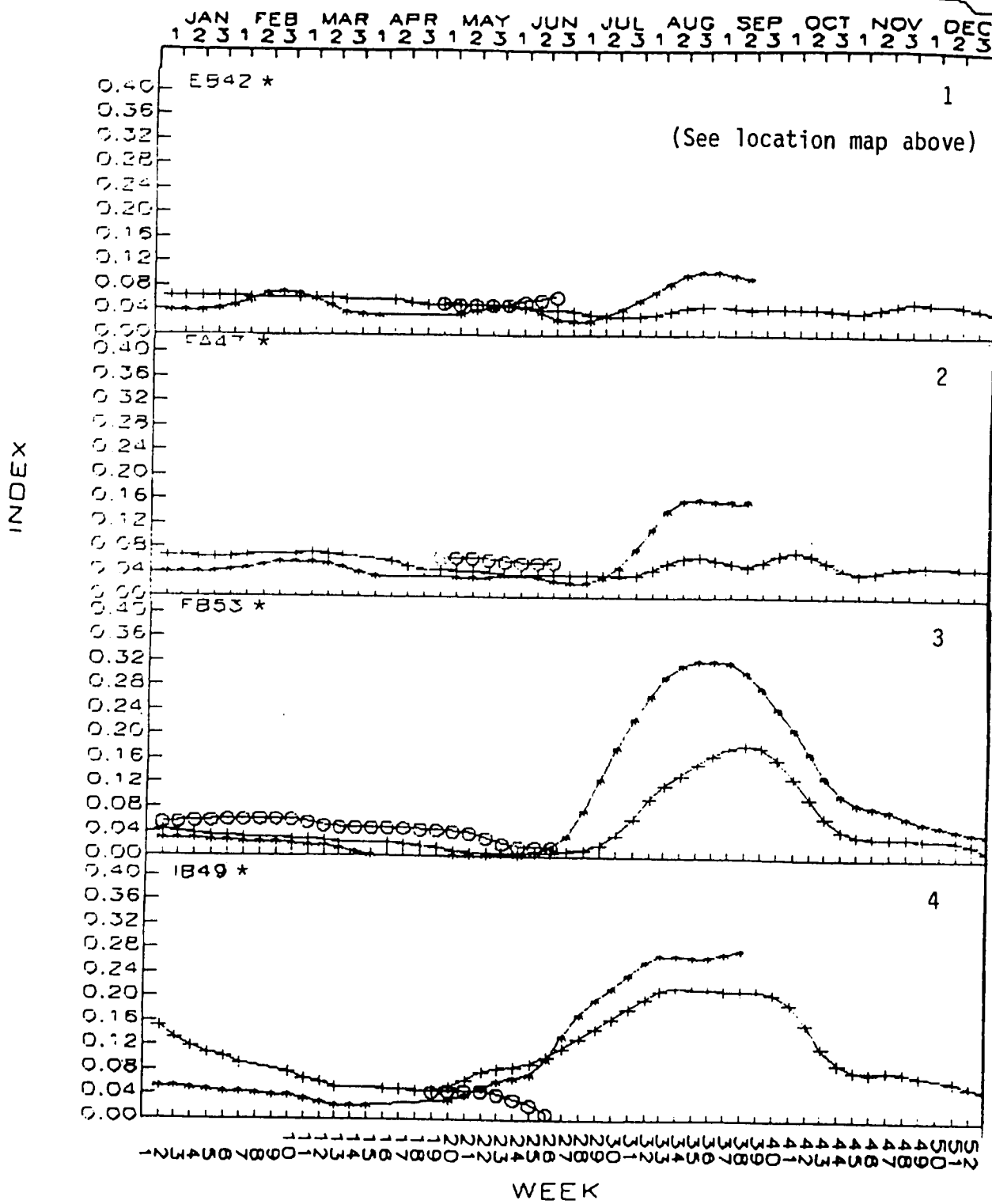
1986 LESS GREEN
NO DIFFERENCE
1986 GREENER

NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

SUDAN

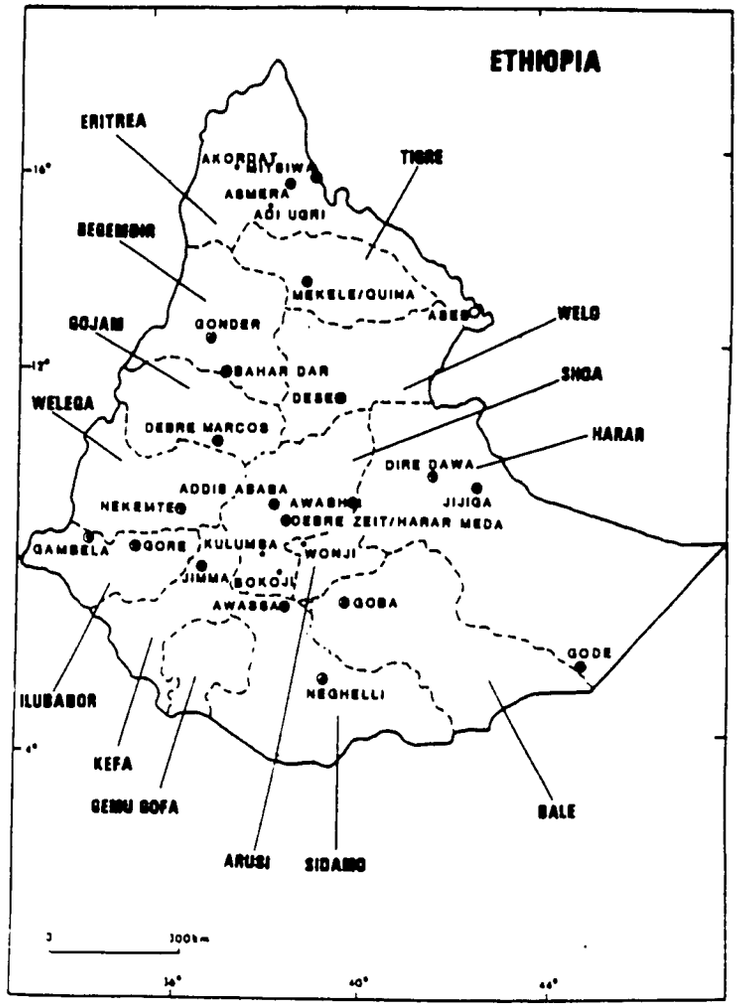
+ = 1984
▪ = 1985
O = 1986





*NOTE: These grid indicators match NVI grid indicators.

ETHIOPIA ASSESSMENT



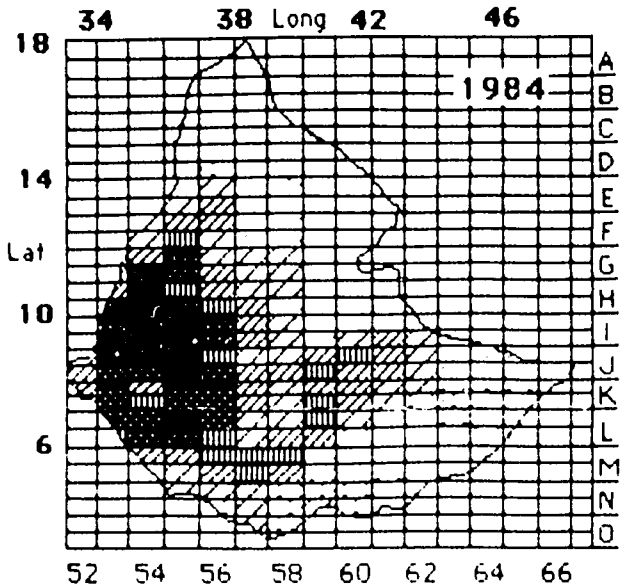
* Prospects for the early season crops are good except in the west. Overall prospects for the current early season (belg) harvest remain favorable due to plentiful rainfall during March-May in important growing areas in the north, center, and east of the country. However, satellite imagery indicates that reduced rainfall during the same period caused poor vegetation growth in the west (Gonder, Gojam, Welega, Illubabor, Kefa, and Gemu-Gofa). The affected area contributes only a small percentage to the total belg crop, but local food deficits are possible. Widespread rainfall in the west during June eliminated dryness and boosted early growth of main season crops.

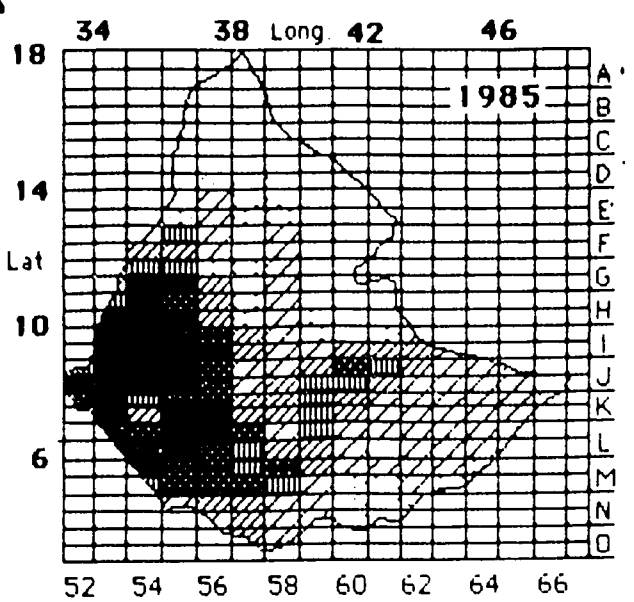
* Satellite NVI data (see accompanying maps and time series) during the third week of June were distorted by cloudiness. Imagery and earlier NVI data indicate that vegetation conditions are excellent in the belg-producing areas of Tigre, Welo, Shoa, and Harar. Belg crops appeared to be in below-average condition in Welega, Ilubabor, Kefa, and southern Gemu Gofa. Southern Gonder and most of Gojam had poor vegetation growth due to the earlier dryness, but little or no belg agriculture takes place in both provinces. Main season crops, however, are delayed; continued normal rainfall into September will be important.

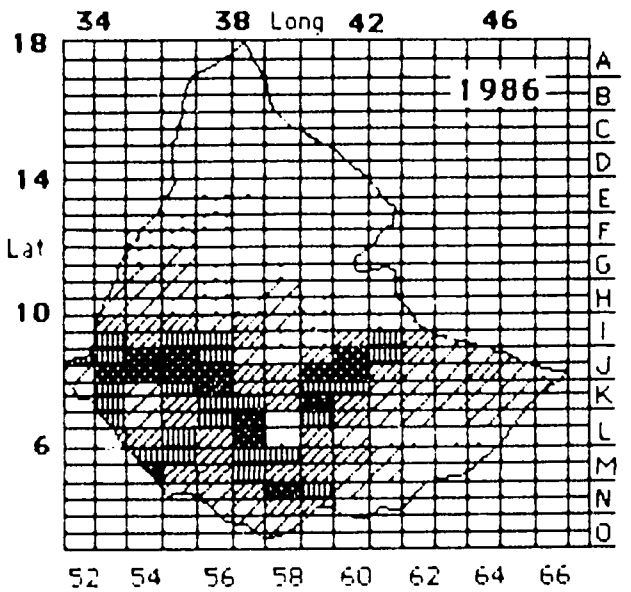
NOAA SATELLITE NORMALIZED VEGETATION INDEX

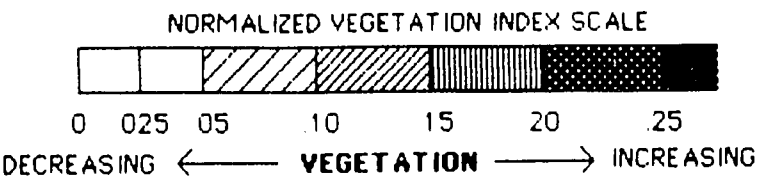
THIRD WEEK OF JUNE

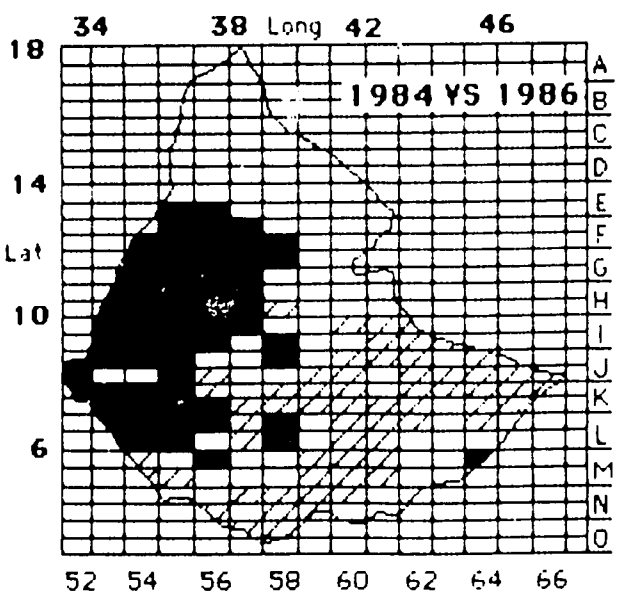
ETHIOPIA



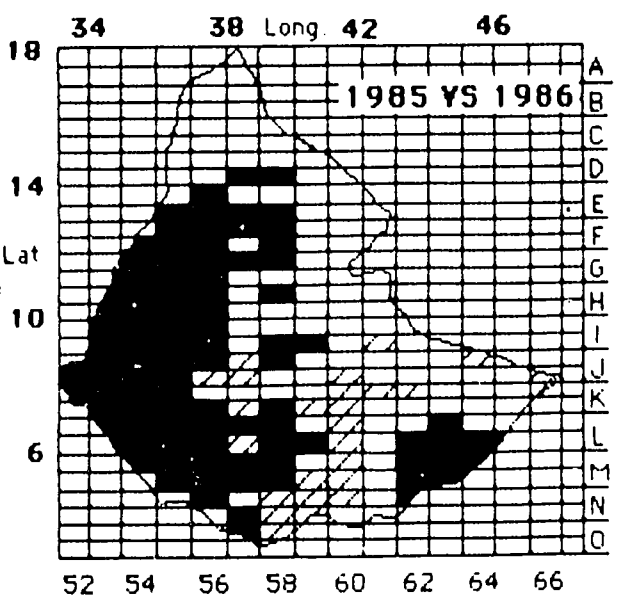






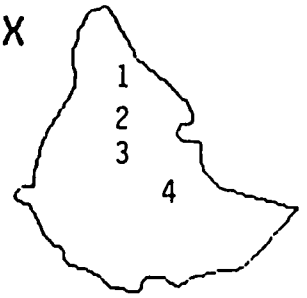


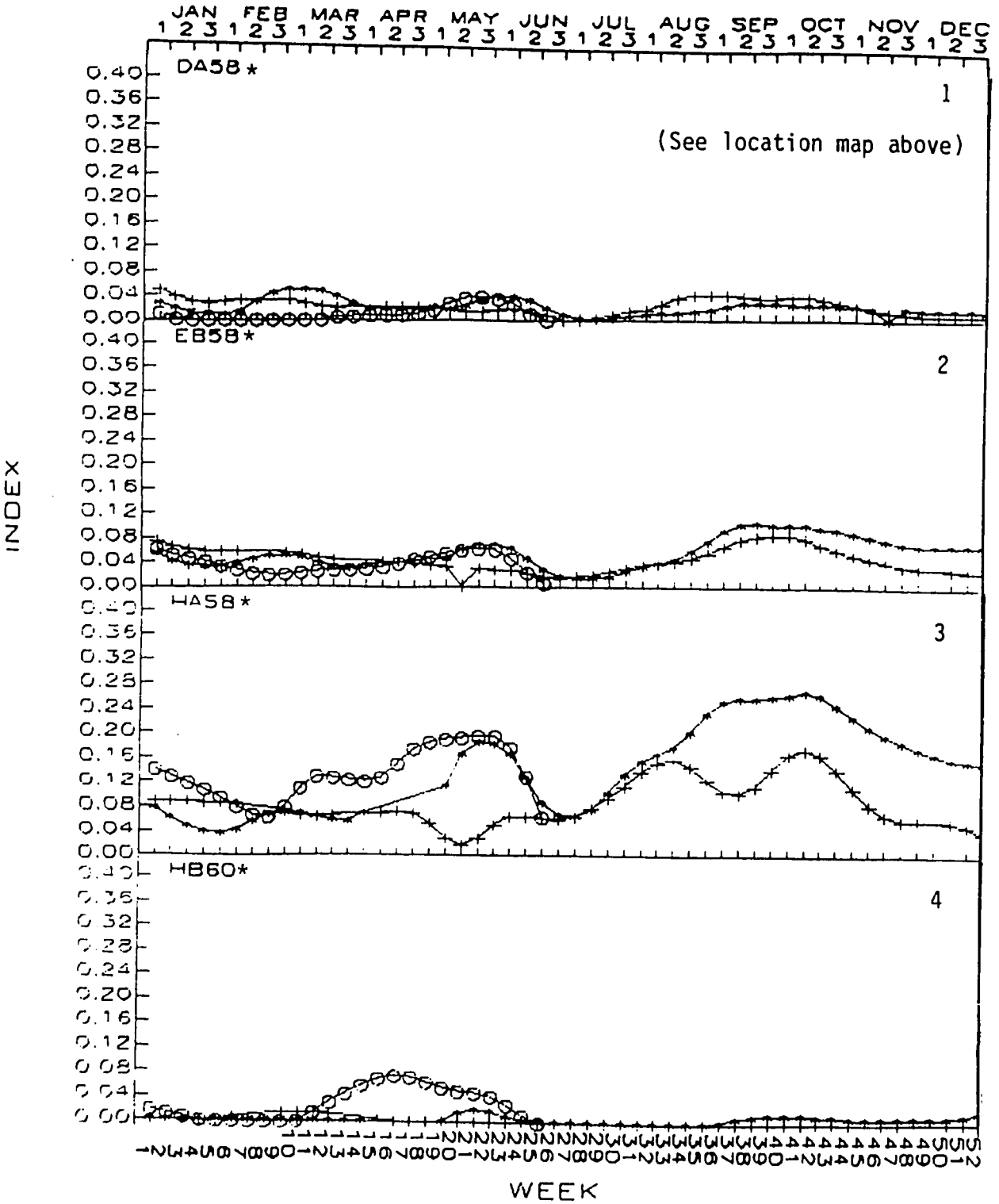
1986 LESS GREEN
NO DIFFERENCE
1986 GREENER



NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS) ETHIOPIA

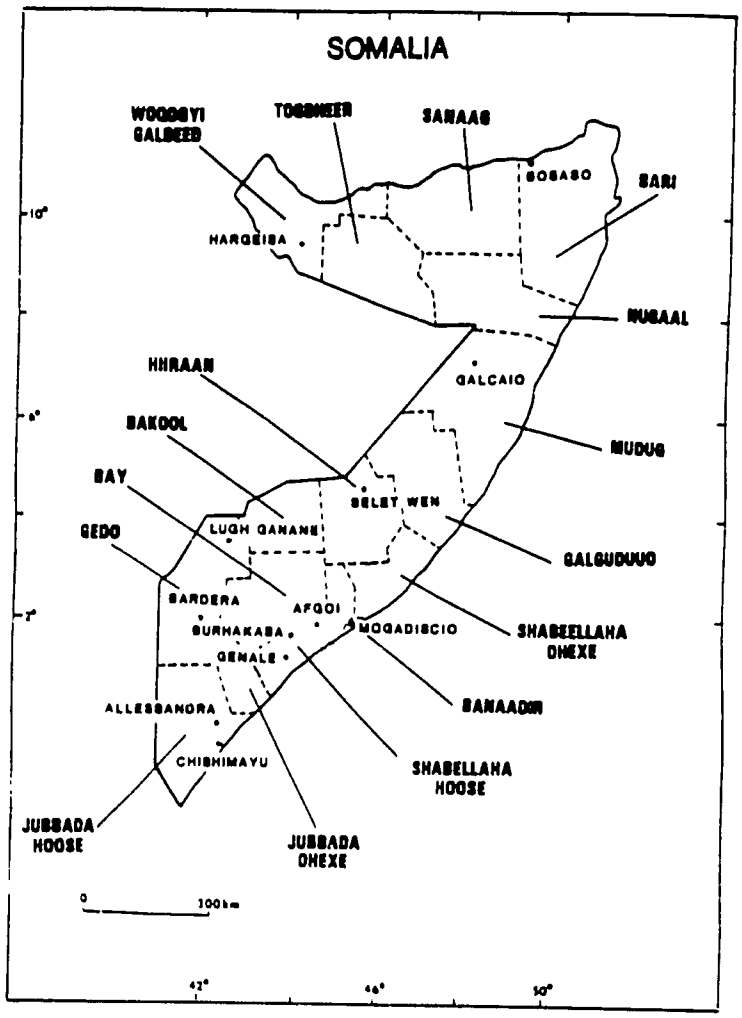
+ = 1984
* = 1985
O = 1986





* NOTE: These grid indicators match NVI grid indicators.

SOMALIA ASSESSMENT

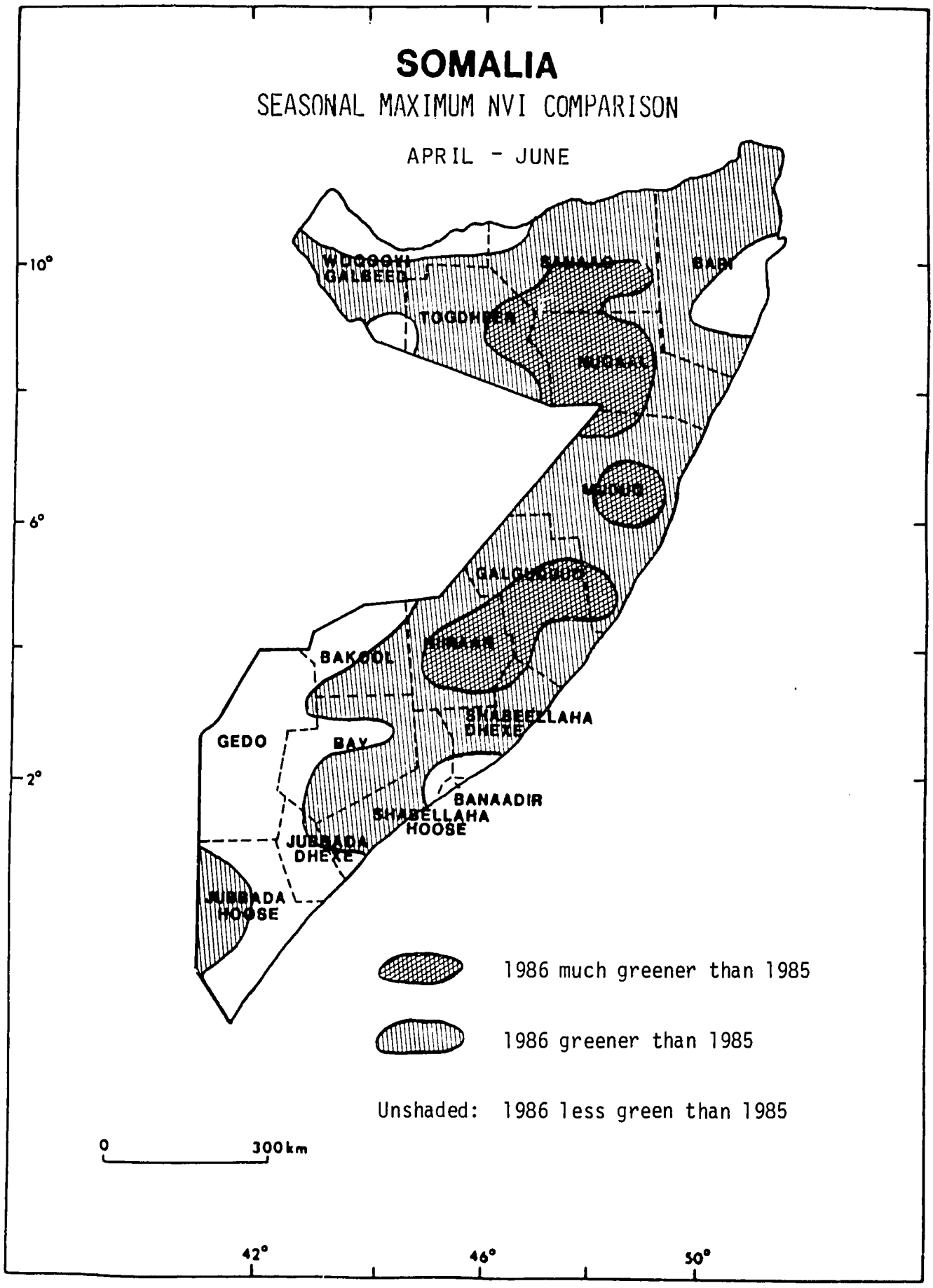


* The outlook for the main season harvest is good to excellent. Satellite data on cloud cover indicate that June rainfall was normal to above normal.

* Satellite normalized vegetation index time series showed that green-up began two to three weeks later than last year in the major crop area, but biomass increased rapidly to exceed last year's over much of the area (see NVI comparison). NVI values decreased rapidly in June, but this was caused only by excessive cloud cover obscuring the ground. Likewise, the NVI grid maps for June 1986 are misleading because of the excessive cloudiness.

* From the NVI comparison, crop prospects should be better than last year over most of the major crop area, with the exception of western parts of the crop area and a local area around Mogadishu, where prospects should be about the same or somewhat lower than last year.

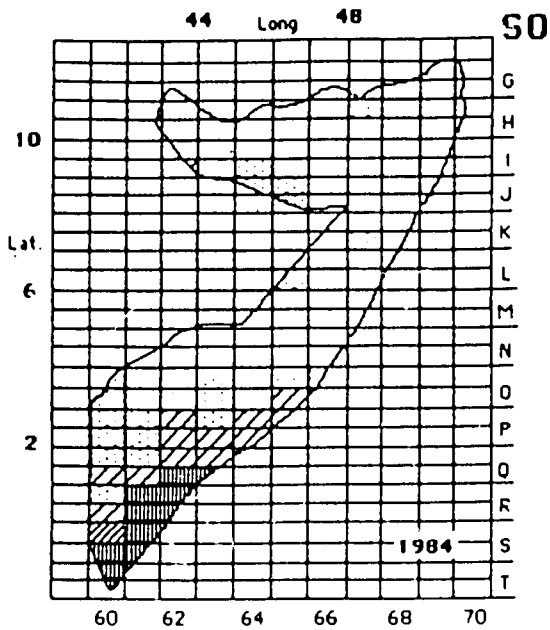
* Rangeland conditions in central and northern parts of the country also appeared favorable. The NVI comparison showed that, with few exceptions, biomass conditions were better than last year.

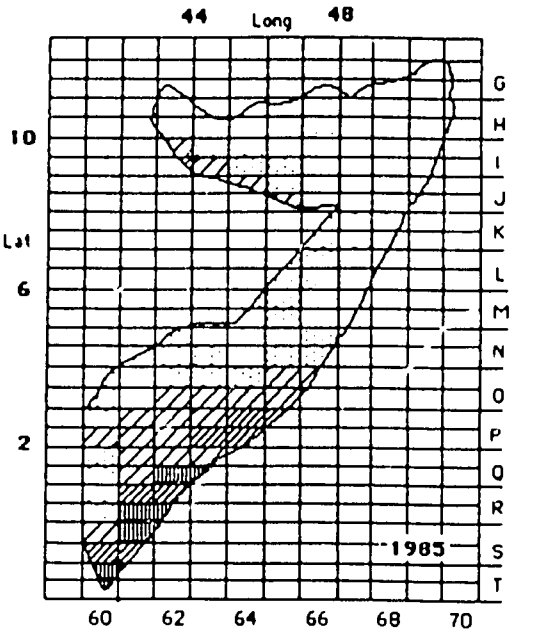

SOMALIA
SEASONAL MAXIMUM NVI COMPARISON
APRIL - JUNE
10°
6°
2°
42°
46°
50°
GALBEED
TOGDHEER
BAKOOL
GEDO
BAY
SHABELLAHA DHEXE
BANAADIR
SHABELLAHA HOOSE
JUBBADA DHEXE
JUBBADA HOOSE
1986 much greener than 1985
1986 greener than 1985
Unshaded: 1986 less green than 1985
0
300km

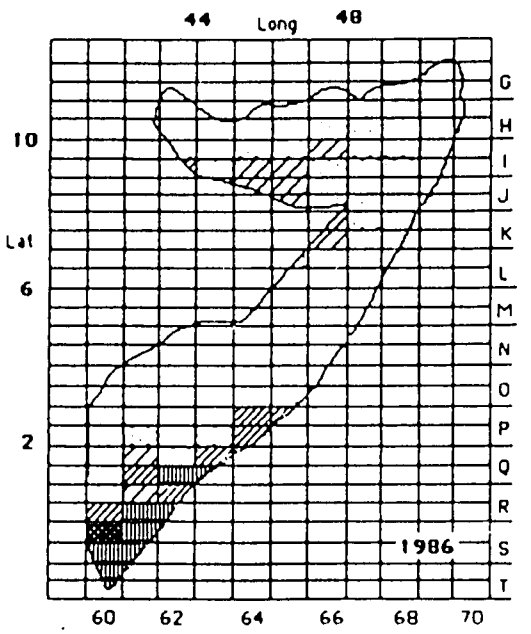
NOAA SATELLITE NORMALIZED VEGETATION INDEX

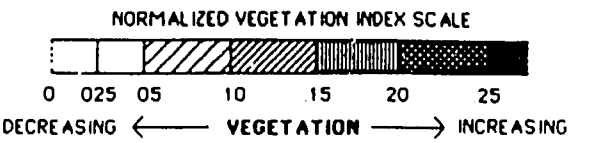
THIRD WEEK OF JUNE

SOMALIA





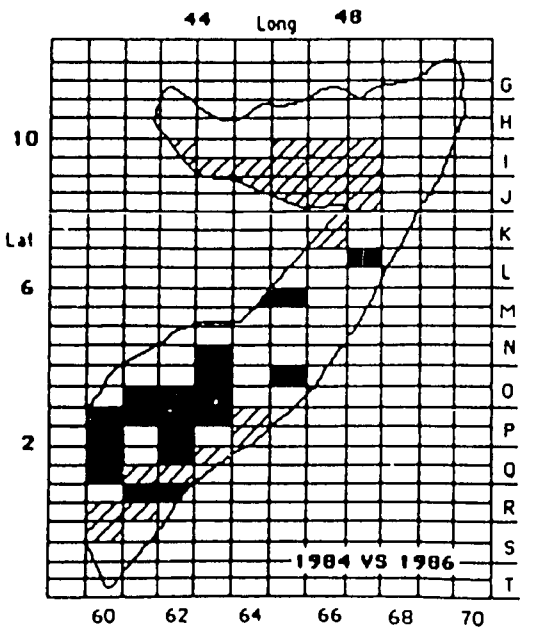


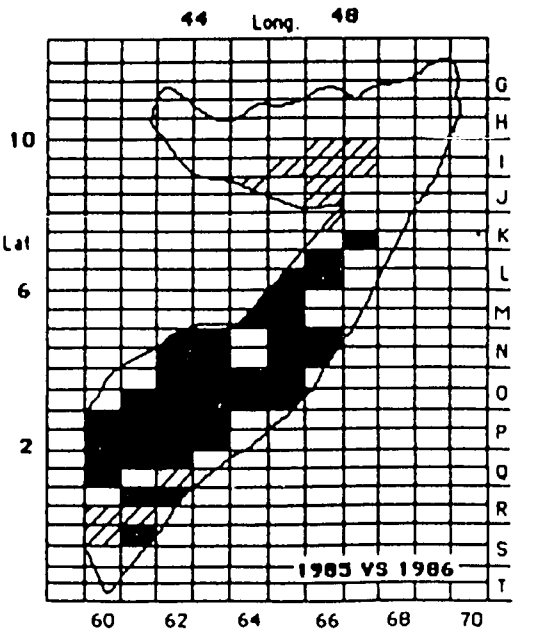


1986 LESS GREEN THAN PREVIOUS YEAR

NO DIFFERENCE FROM PREVIOUS YEAR

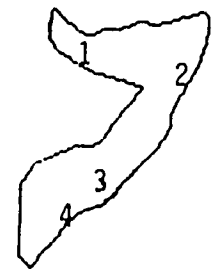
1986 GREENER THAN PREVIOUS YEAR

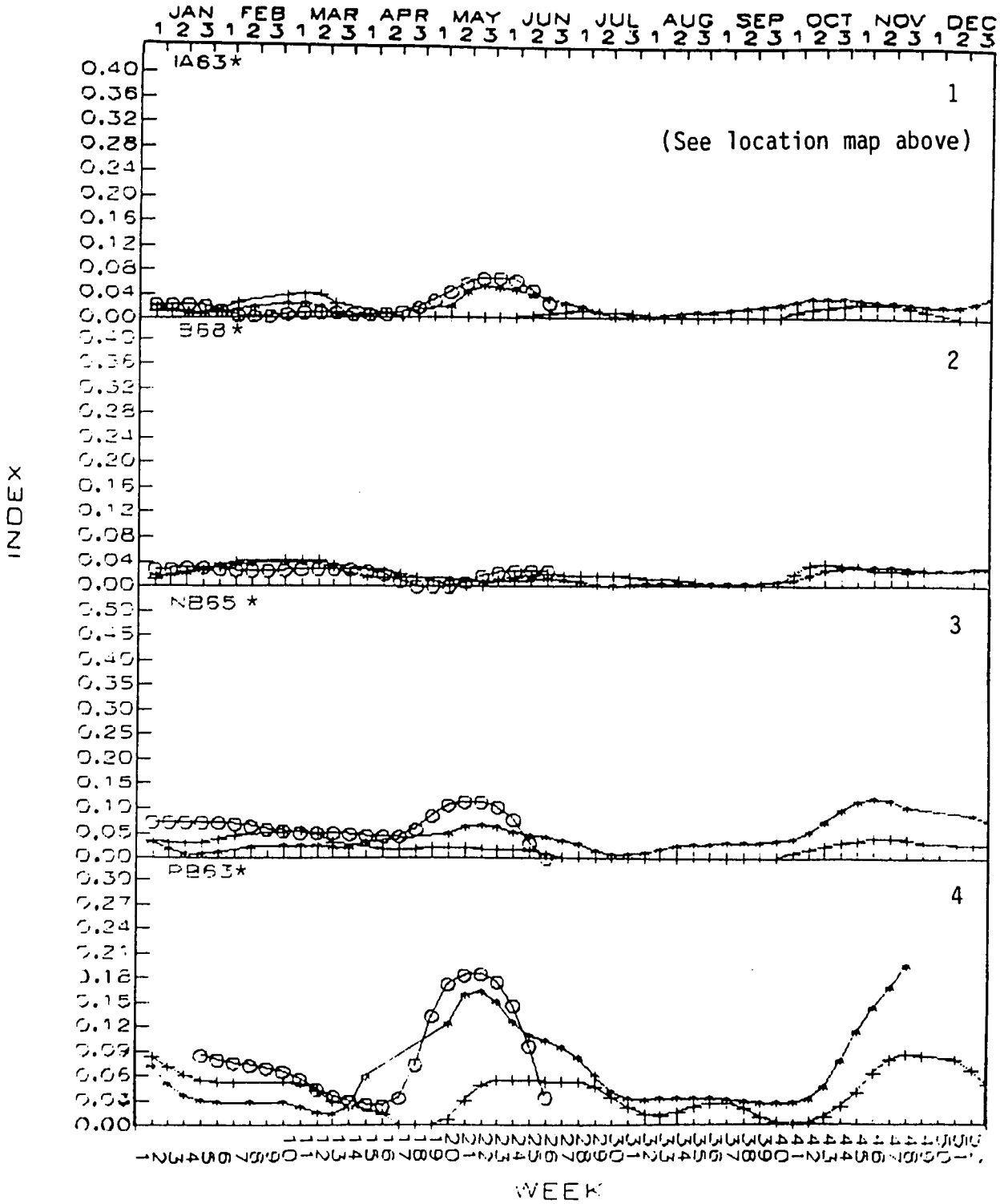




NORMALIZED VEGETATION INDEX
TIME SERIES
(SELECT GRIDS)
SOMALIA

+ = 1984
* = 1985
O = 1986





* NOTE: These grid indicators match NVI grid indicators.