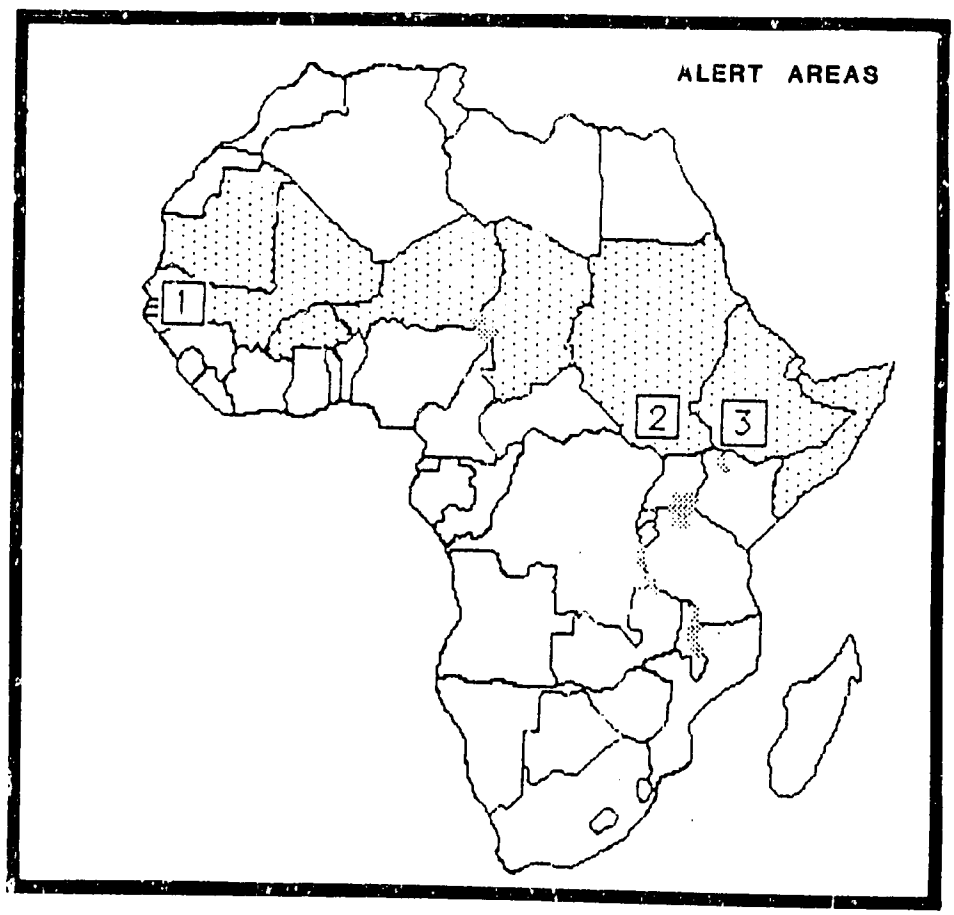
PN-ABE-146 64484

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)

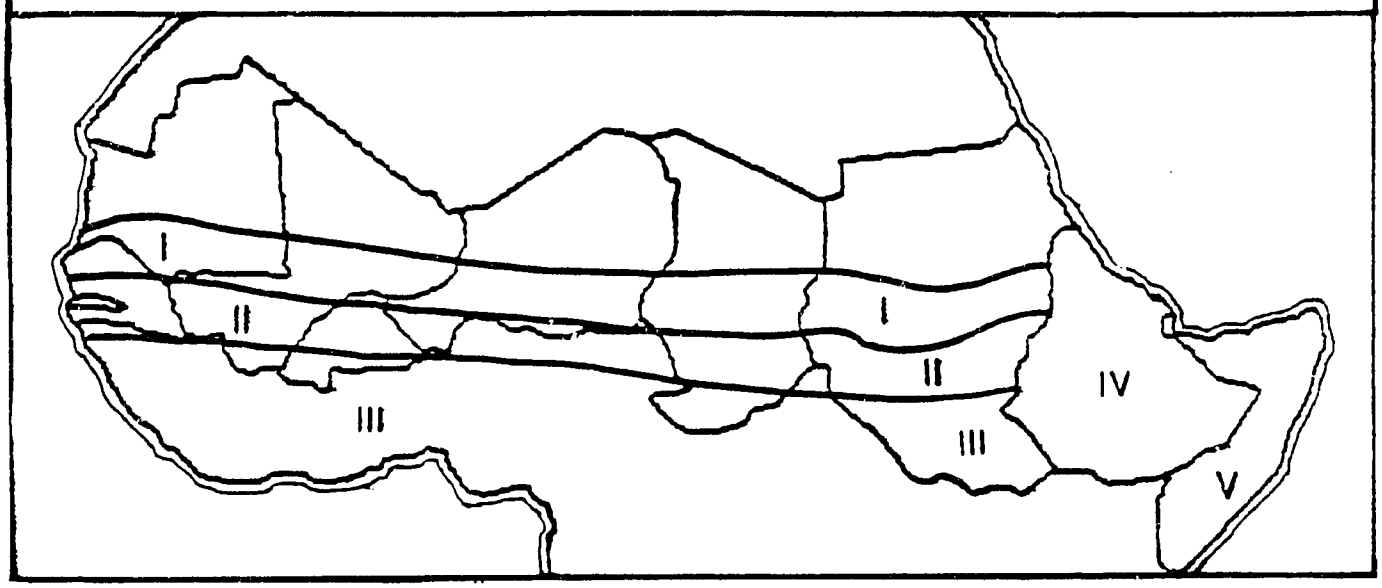
PREPARED IN SUPPORT OF THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

JULY 1986

ISSUED ON AUGUST 5, 1986 VOLUME 2, NUMBER 2

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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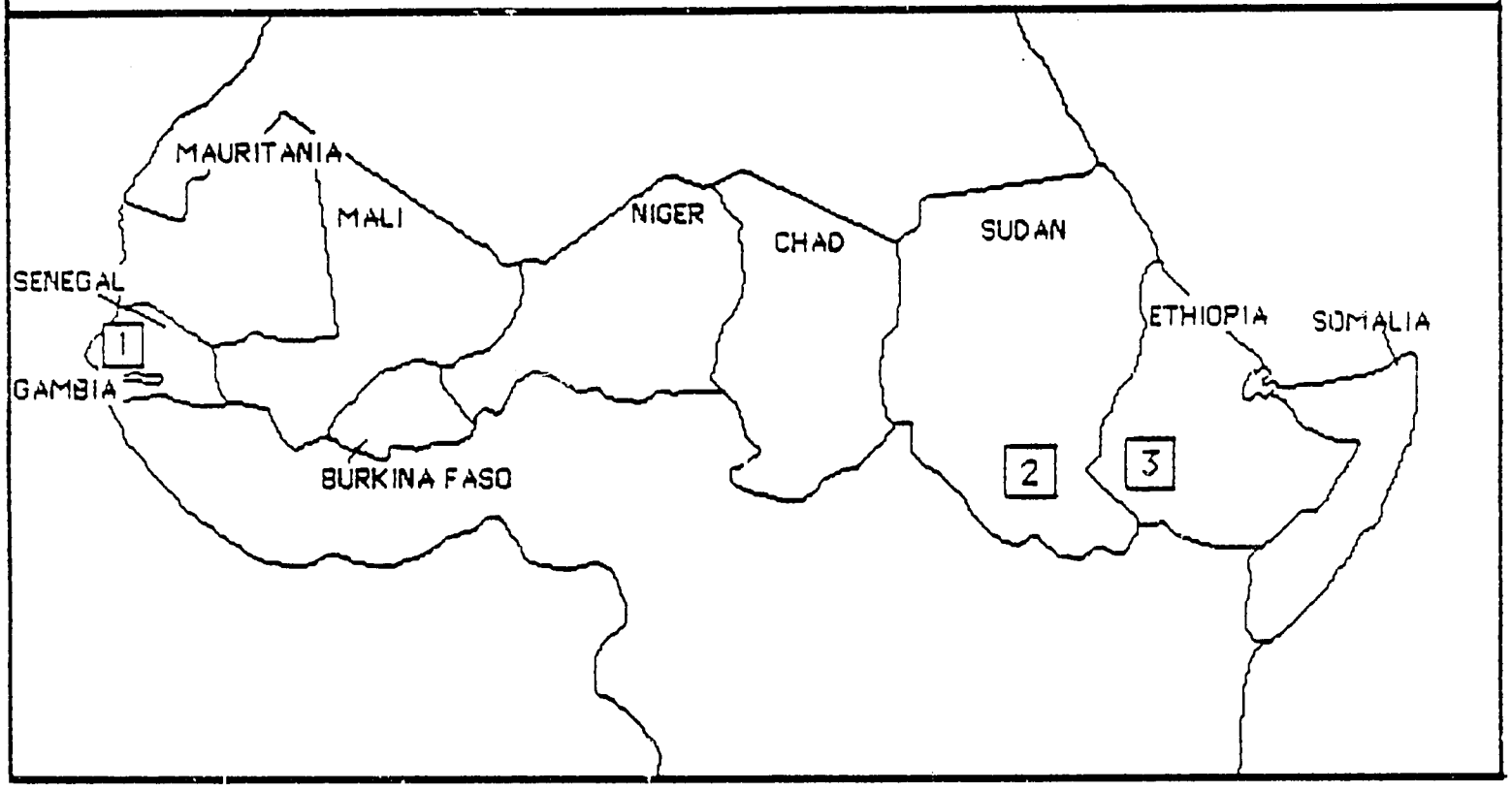
REGIONAL ANALYSIS

ALERT AREAS



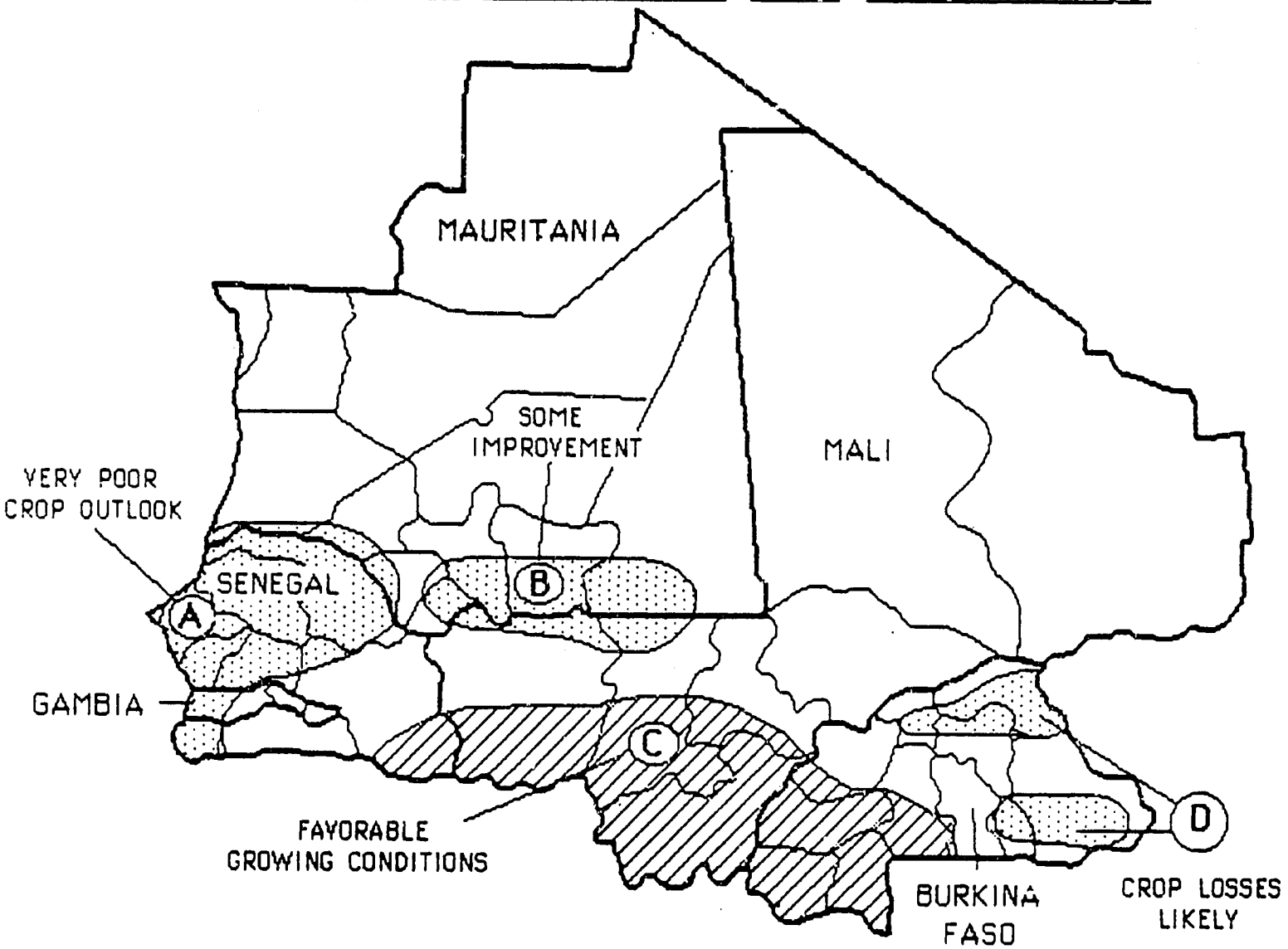
1 Crop outlook for Senegal is very poor. July rainfall in the major sorghum, millet, groundnut growing area continued well below normal. The outlook is also below average in Gambia and Mauritania.

2 Earlier dryness damaged crops and pastures in southern Sudan. Recent rains improved conditions for pastures and late-planted crops.

3 In Ethiopia, main season crop prospects are below normal in western areas. Dryness during March - May adversely affected main season crops (April - May sowing) as well as first season crops (March sowing).

HIGHLIGHTS

GAMBIA SENEGAL MAURITANIA MALI BURKINA FASO



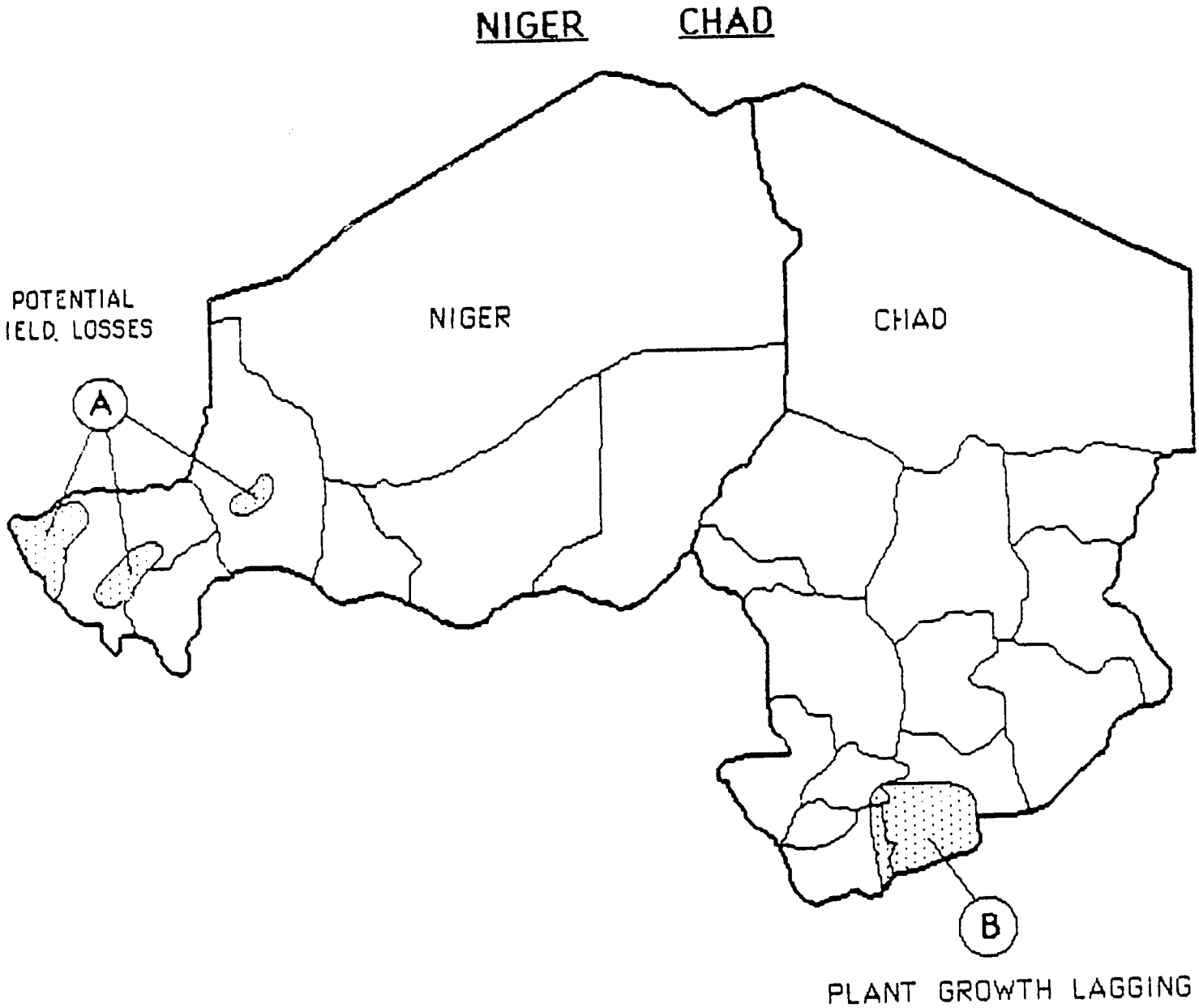
(A) VERY POOR CROP CONDITIONS: Prospects for sorghum, millet, and groundnuts in Senegal are very poor following unusually dry weather in June and July. Gambia crop prospects are below average in the west.

(B) SOME IMPROVEMENT: Crop and pasture conditions are slightly below average in Mauritania and adjacent areas of Mali. Heavy rains during the last 10 days of July brought some improvement.

(C) FAVORABLE GROWING CONDITIONS: Growing conditions remain good to excellent over major crop areas of Mali and Burkina Faso.

(D) CROP LOSSES LIKELY: Some crop losses are likely in northern and eastern Burkina Faso, particularly in the northeast. July rainfall was well below normal in this area.

HIGHLIGHTS

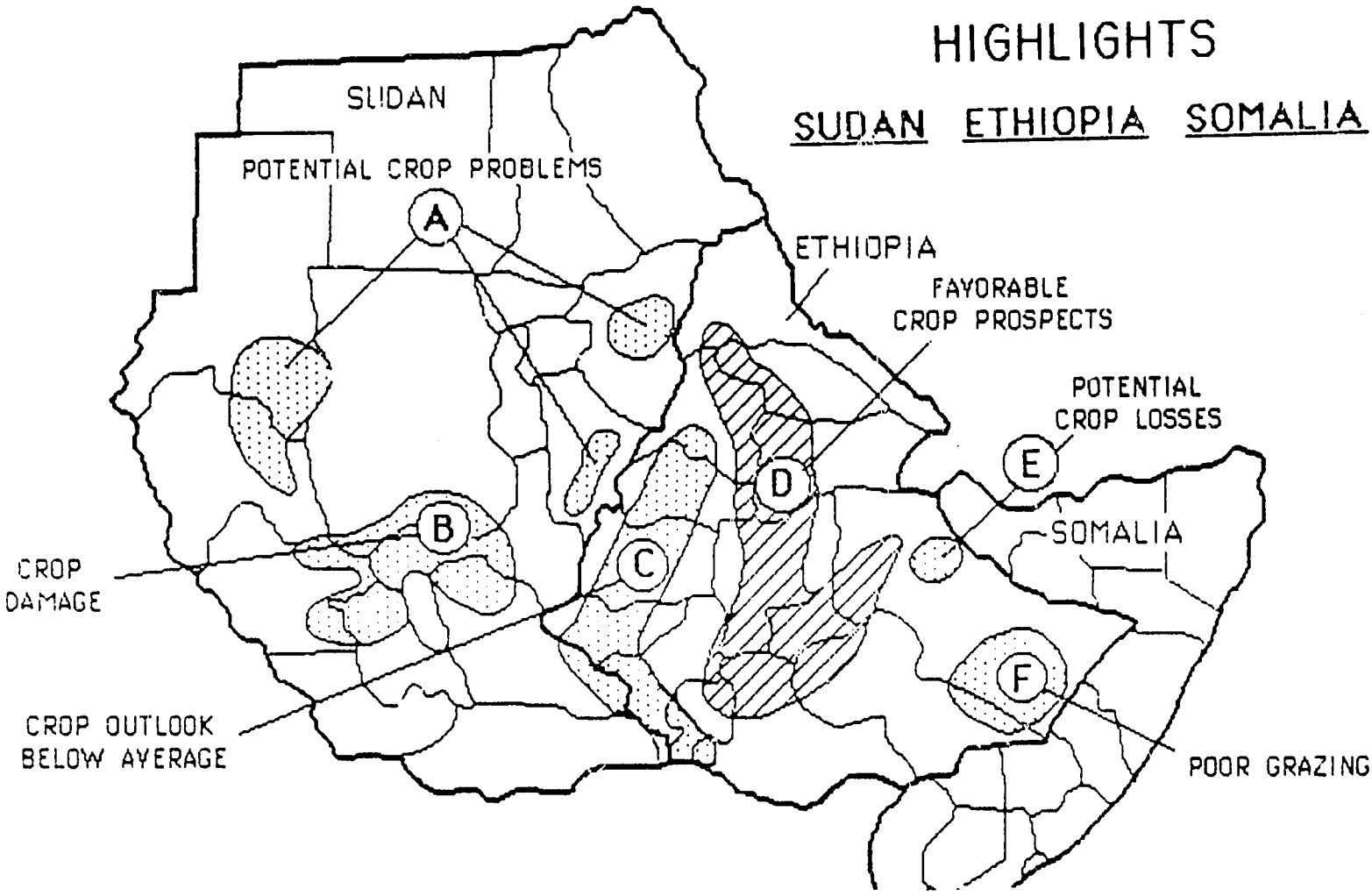


(A) POTENTIAL YIELD LOSSES: Crop and pasture conditions are below normal in Niamey Department in western Niger and localized areas of Tahoua to the east. July rainfall was around one-half normal in the affected areas. Seasonal rains will be needed through September to prevent significant crop losses. Conditions elsewhere in Niger are similar to or better than last year.

(B) PLANT GROWTH LAGGING: Crop and pasture conditions remain somewhat below average in parts of southern Chad, especially in Moyen Chari. Though June-July rainfall has improved growth, condition of early-planted crops may still be below average. Overall crop conditions in Chad are good to excellent.

HIGHLIGHTS

SUDAN ETHIOPIA SOMALIA



(A) POTENTIAL CROP PROBLEMS: Crop/pasture conditions are worse than last year in parts of eastern Darfur, Blue Nile, and Kassala. Abundant Aug.-Sept. rain is needed to prevent crop losses. Overall Sudanese cereal prospects are less favorable than last year.

(B) CROP DAMAGE: Early crops sustained major damage from previous dryness. Condition of pastures/late-planted crops in this area remained sub-normal in July; but improved substantially in the rest of S. Sudan.

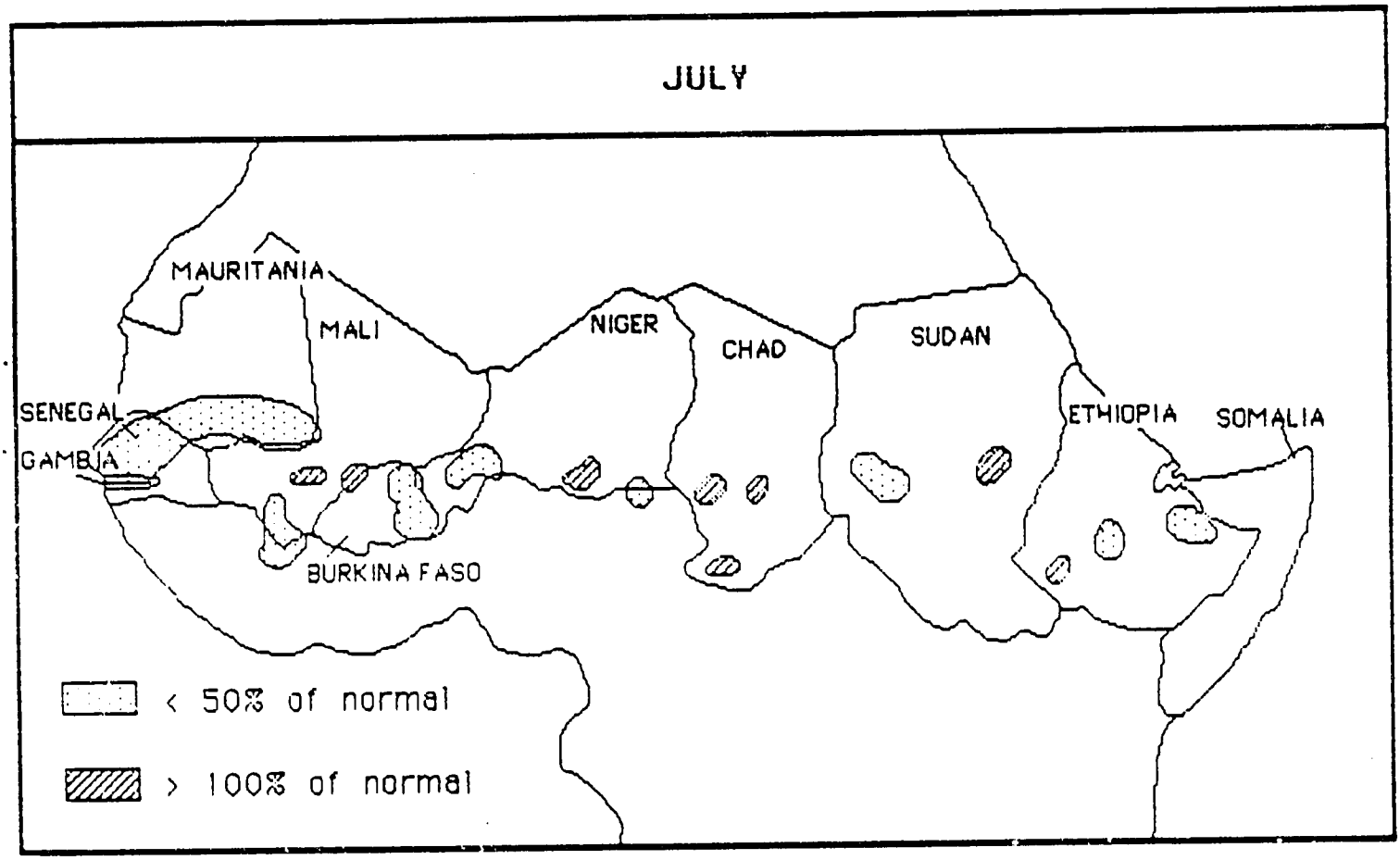
(C) CROP OUTLOOK BELOW AVERAGE: Main season crop prospects are below average in W. Ethiopia from Apr.-May dryness. June-July rainfall benefitted late-planted crops.

(D) FAVORABLE CROP PROSPECTS: Growing conditions are good to excellent in northern and central Ethiopia. The overall crop outlook remains better than in 1985 and 1984.

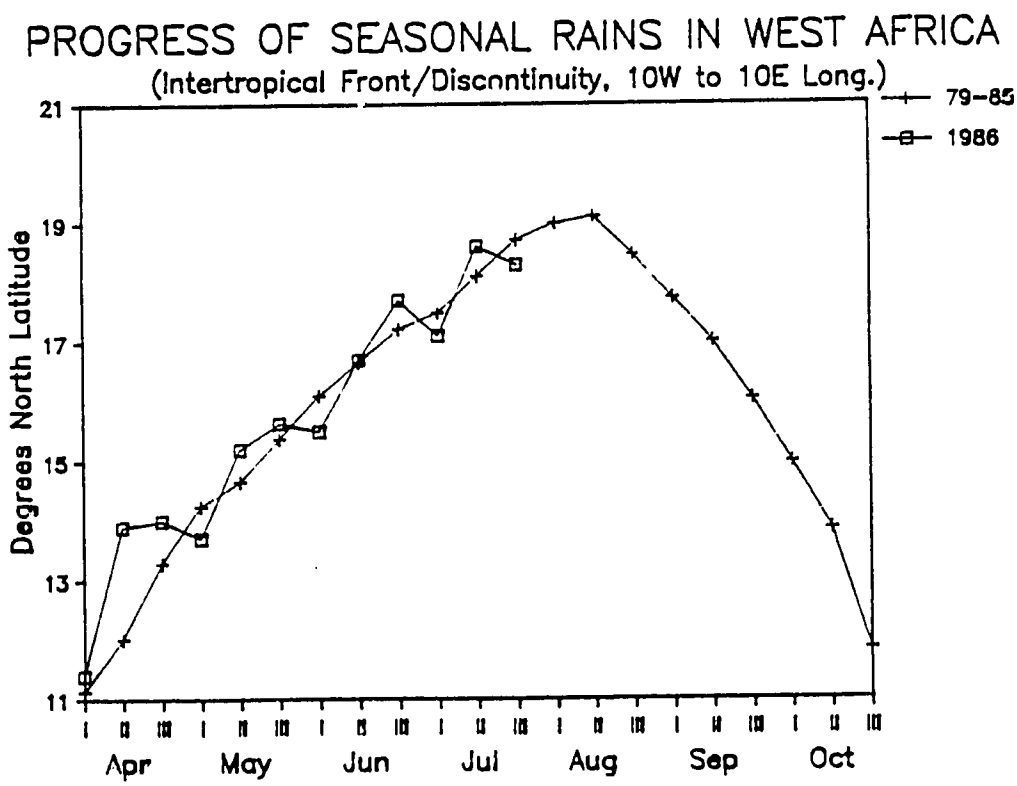
(E) POTENTIAL CROP LOSSES: Dry weather in July reduced crop prospects around Jijiga in northern Harar province.

(F) POOR GRAZING: Pasture growth is unfavorable in Ethiopia's southeastern lowlands.

MONTHLY RAINFALL



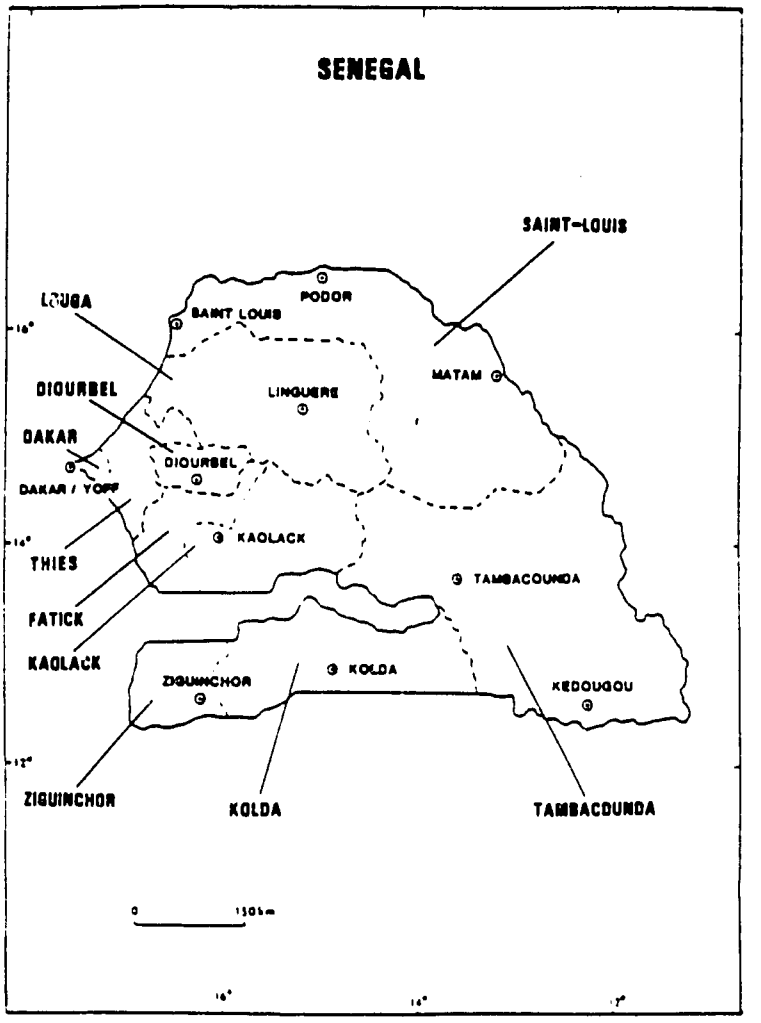
Based on preliminary data through July 27th.



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

COUNTRY ANALYSES

SENEGAL ASSESSMENT



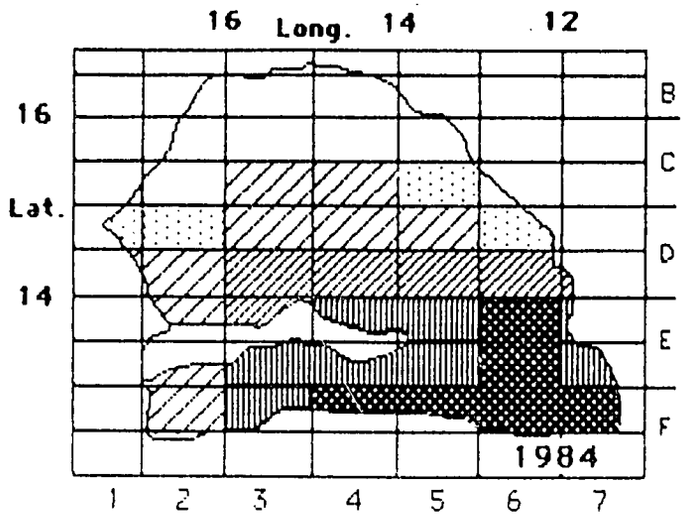
* Prospects for sorghum, millet, and groundnut harvests have become very poor. Most of this year's rains have fallen to the south and east of the Groundnut Basin, where the bulk of the country's cereals and groundnuts are grown. Widespread rains fell only on July 9 and 25 in this critical region, and monthly totals were well under 50 percent of normal. The dryness extends southward through Gambia to the border with Guinea-Bissau, with crop losses likely everywhere west and north of a line extending from Kolda through Tambacounda and Bakel.

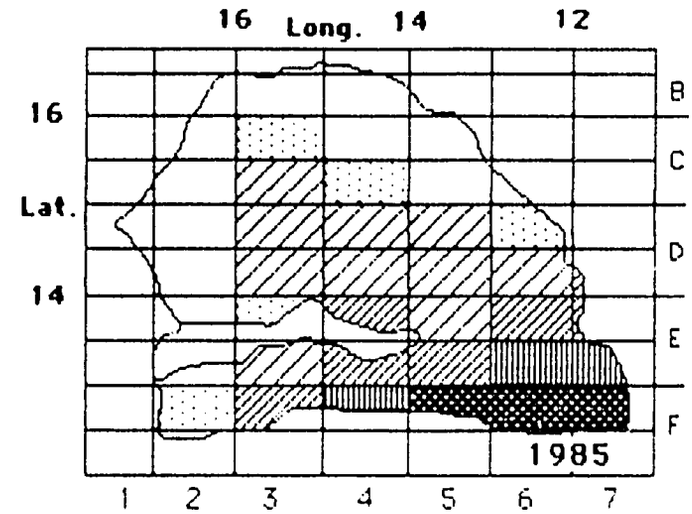
* The hardest-hit area appears to be around Kaolack and Diourbel; preliminary rainfall data indicate the rainy season to date is one of the driest on record. Satellite imagery and vegetation indices show little plant growth in this area. Even with normal rainfall during August and September, overall cereal production will be below average and well below last year's levels. Crop prospects are satisfactory in the southeast, but this is a minor growing area.

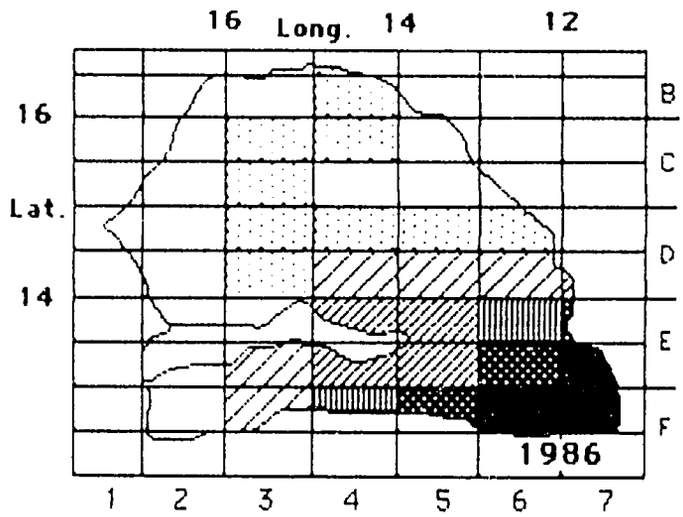
NOAA SATELLITE NORMALIZED VEGETATION INDEX

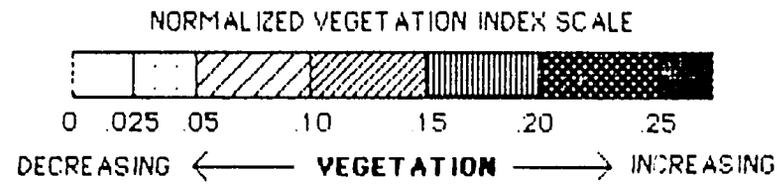
THIRD WEEK OF JULY

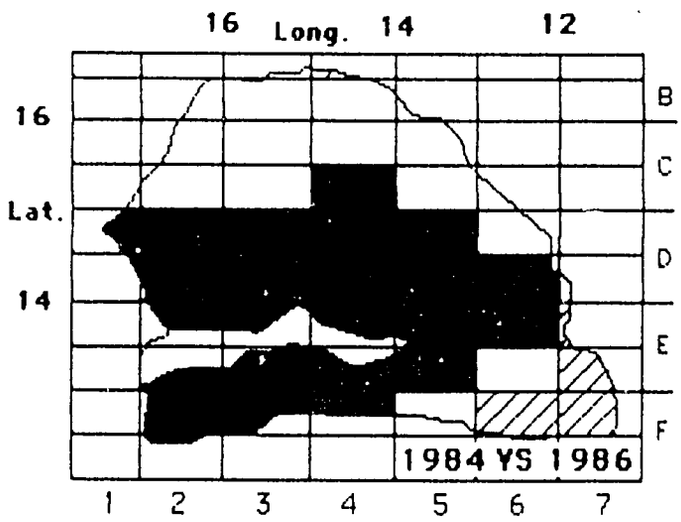
SENEGAL

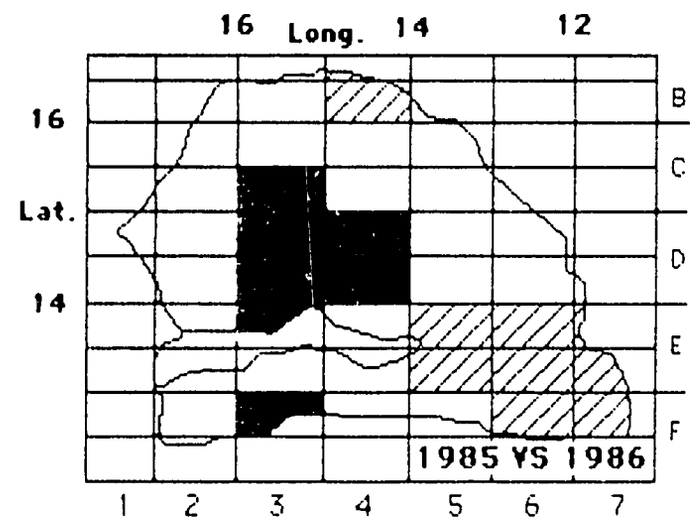












1986 LESS GREEN THAN PREVIOUS YEAR

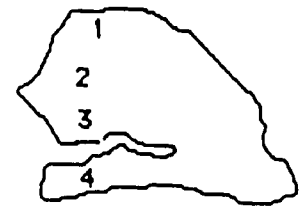
NO DIFFERENCE FROM PREVIOUS YEAR

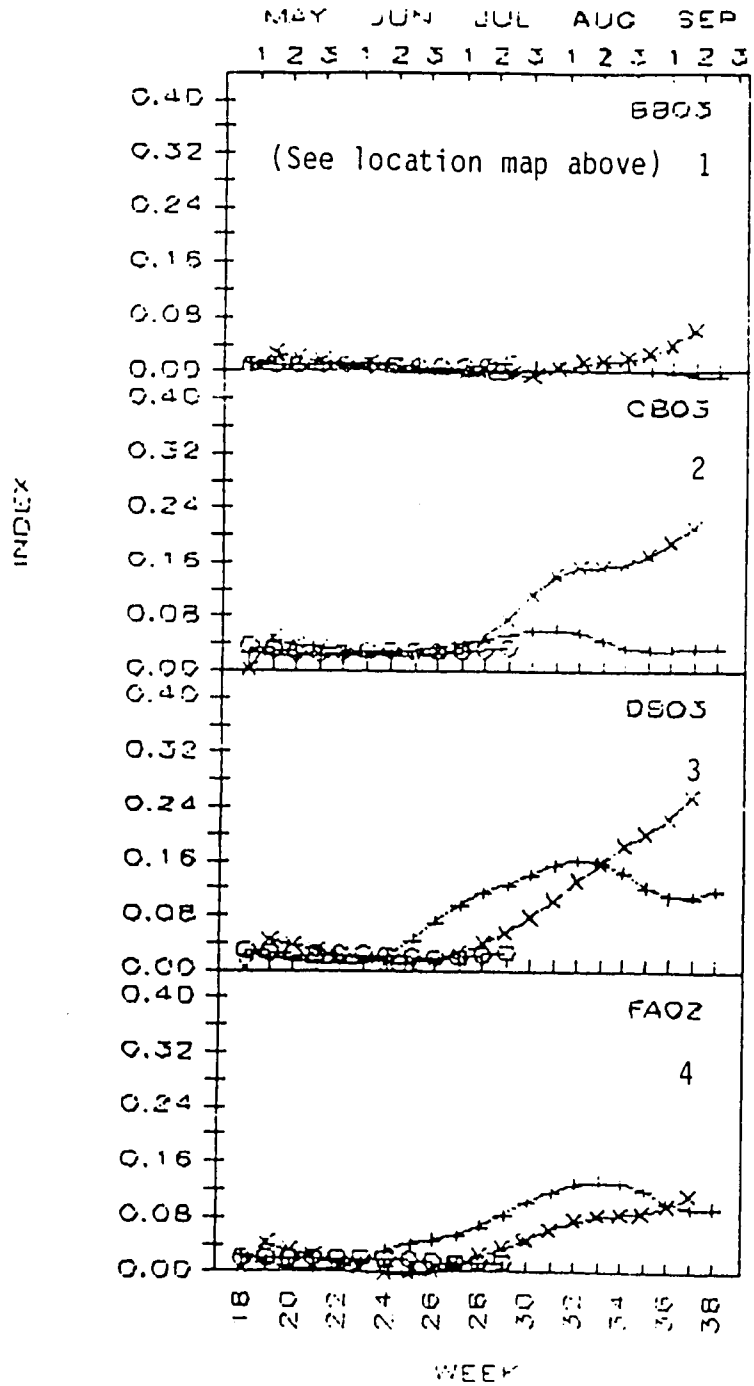
1986 GREENER THAN PREVIOUS YEAR

NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

SENEGAL

+ = 1984
* = 1985
0 = 1986





*NOTE: These grid indicators match NVI grid indicators.

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Senegal Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Dakar/Yoff	Dec	0	0	0	0	0	0	24	0							
	%-N	???	???	???	0	0	0	218	0							
	%-R	95	95	95	81	62	52	76	24							
	Cum	0	0	0	0	0	0	24	24							
	%-N	???	???	???	0	0	0	114	53							
	%-R	95	95	95	81	57	33	67	52							
Diourbel	Dec	0	0	0	0	0	1	15	0							
	%-N	???	???	0	0	0	7	47	0							
	%-R	90	86	90	62	33	29	48	10							
	Cum	0	0	0	0	0	1	16	16							
	%-N	???	???	0	0	0	3	25	16							
	%-R	90	81	76	52	19	10	10	5							
Kaolack	Dec	0	0	0	0	0	11	45	1							
	%-N	???	???	0	0	0	42	183	3							
	%-R	86	95	86	52	24	48	86	10							
	Cum	0	0	0	0	0	11	56	57							
	%-N	???	???	0	0	0	24	80	52							
	%-R	86	86	76	43	14	19	33	10							
Kedougou	Dec	54	0	145	36	48	19	78	62							
	%-N	600	0	604	61	83	31	111	74							
	%-R	95	25	95	25	45	15	57	29							
	Cum	54	54	199	235	283	302	380	442							
	%-N	600	270	452	228	176	135	130	117							
	%-R	95	80	95	95	95	95	95	75							
Kolda	Dec	0	0	2	37	63	0	62	62							
	%-N	0	0	25	154	217	0	98	91							
	%-R	71	81	48	71	90	0	48	52							
	Cum	0	0	2	39	102	102	164	226							
	%-N	0	0	20	115	162	93	95	94							
	%-R	71	62	38	62	81	57	57	48							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Senegal Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Linguere	Dec	0	0	0	0	0	0	26	0							
	%-N	???	???	???	0	0	0	118	0							
	%-R	90	90	86	43	29	38	57	24							
	Cum	0	0	0	0	0	0	26	26							
	%-N	???	???	???	0	0	0	60	35							
	%-R	90	86	76	33	10	5	19	5							
Matam	Dec	0	0	0	0	0	2	26	0							
	%-N	???	???	0	0	0	22	87	0							
	%-R	95	81	76	62	24	33	62	10							
	Cum	0	0	0	0	0	2	28	28							
	%-N	???	???	0	0	0	7	48	31							
	%-R	95	81	67	43	14	10	33	10							
Podor	Dec	0	0	0	0	0	0	32	0							
	%-N	???	???	???	0	0	0	291	0							
	%-R	90	90	95	71	57	52	90	33							
	Cum	0	0	0	0	0	0	32	32							
	%-N	???	???	???	0	0	0	160	100							
	%-R	90	86	86	67	43	24	86	57							
Tambacounda	Dec	0	0	28	1	10	34	25	46							
	%-N	0	0	215	4	25	81	41	82							
	%-R	67	67	76	14	14	33	19	43							
	Cum	0	0	28	29	39	73	98	144							
	%-N	0	0	165	67	47	58	53	60							
	%-R	67	48	71	38	10	14	5	5							
Ziguinchor	Dec	0	0	0	9	20	3	24	131							
	%-N	???	0	0	53	63	6	36	142							
	%-R	95	76	71	52	33	5	10	81							
	Cum	0	0	0	9	29	32	56	187							
	%-N	???	0	0	45	56	30	33	71							
	%-R	95	76	57	43	29	10	5	29							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

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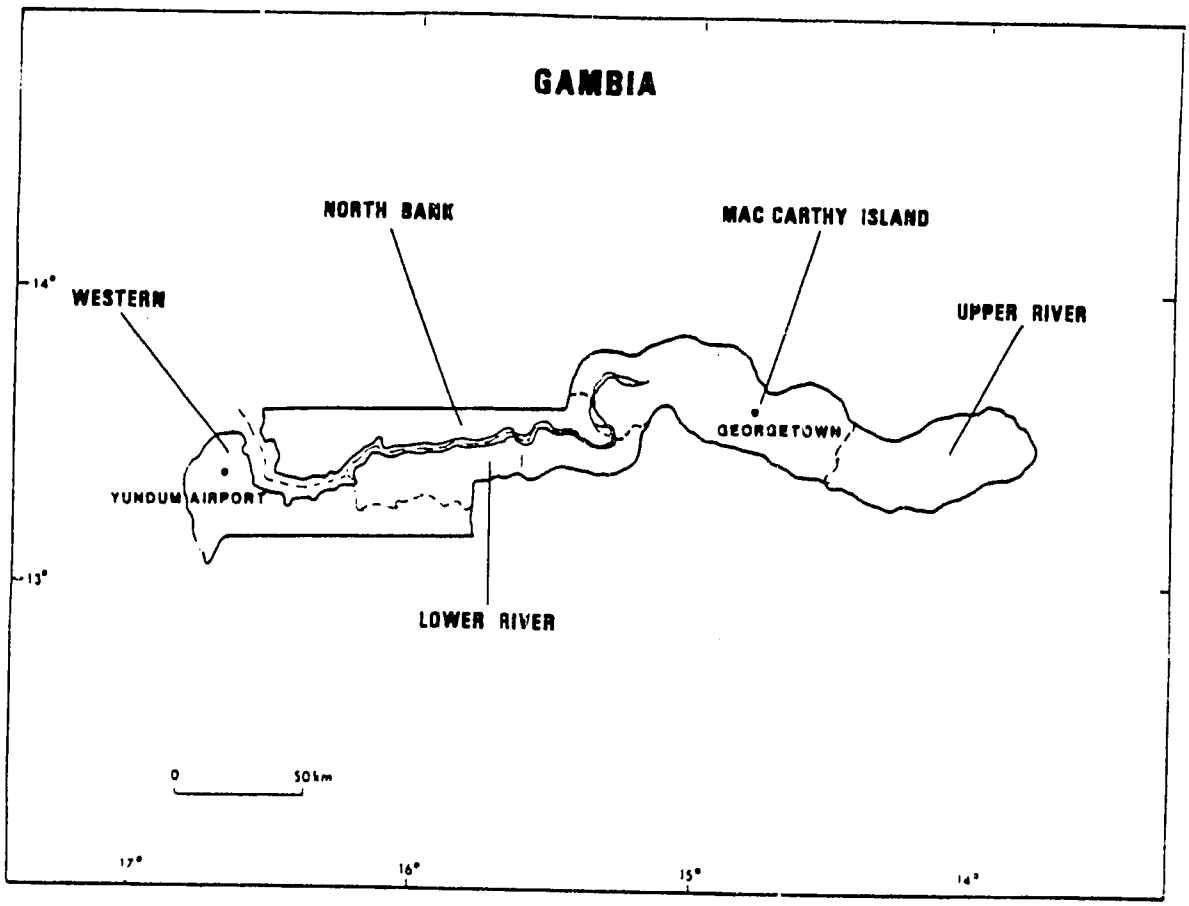
GAMBIA ASSESSMENT



* Cereal production will be below average in the west. Growing conditions have been poor in the western half of Gambia (west of Jenoi). Crop and pasture conditions improve to the east.

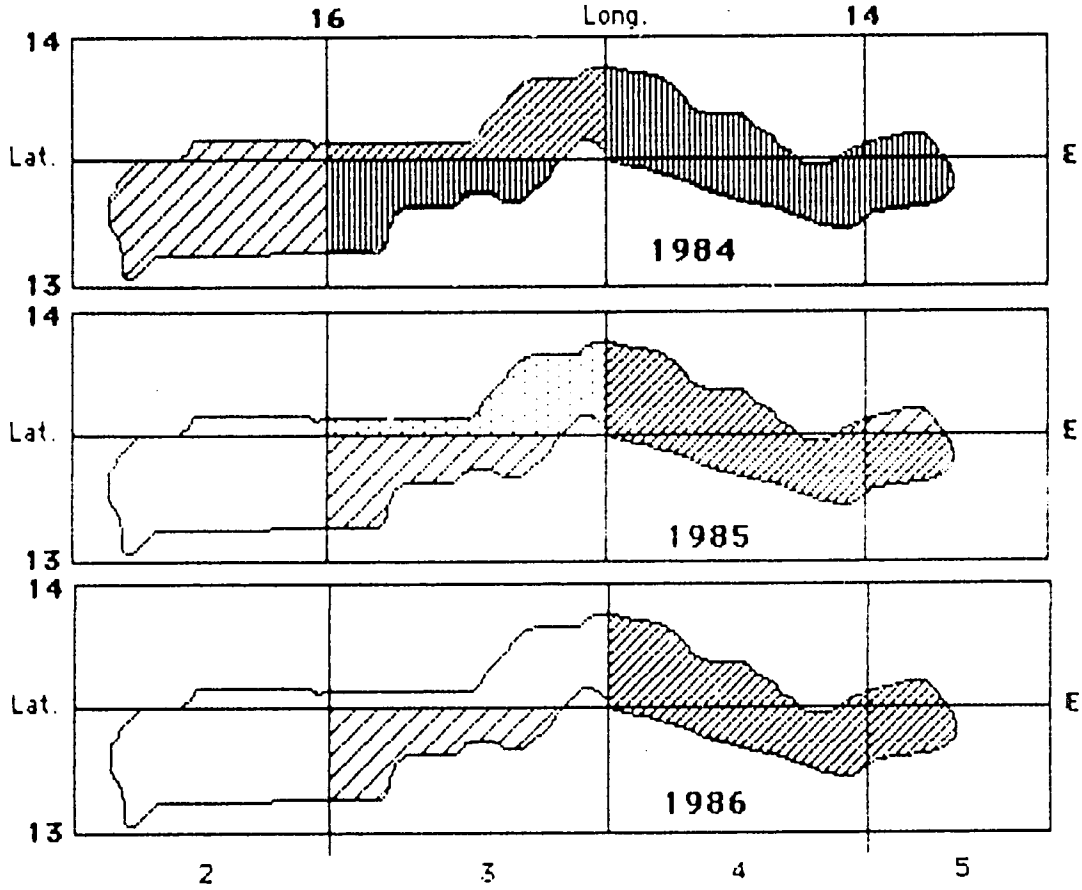
* Driest regions are the North Bank, Lower River, and Western.

* Vegetation indices were lower this year than in 1984 throughout the country, and lower than in 1985 in the North Bank area (see the NVI maps). More recent data indicate that the entire western two-thirds of the country has less vegetation development than last year.

NOAA SATELLITE NORMALIZED VEGETATION INDEX

THIRD WEEK OF JULY

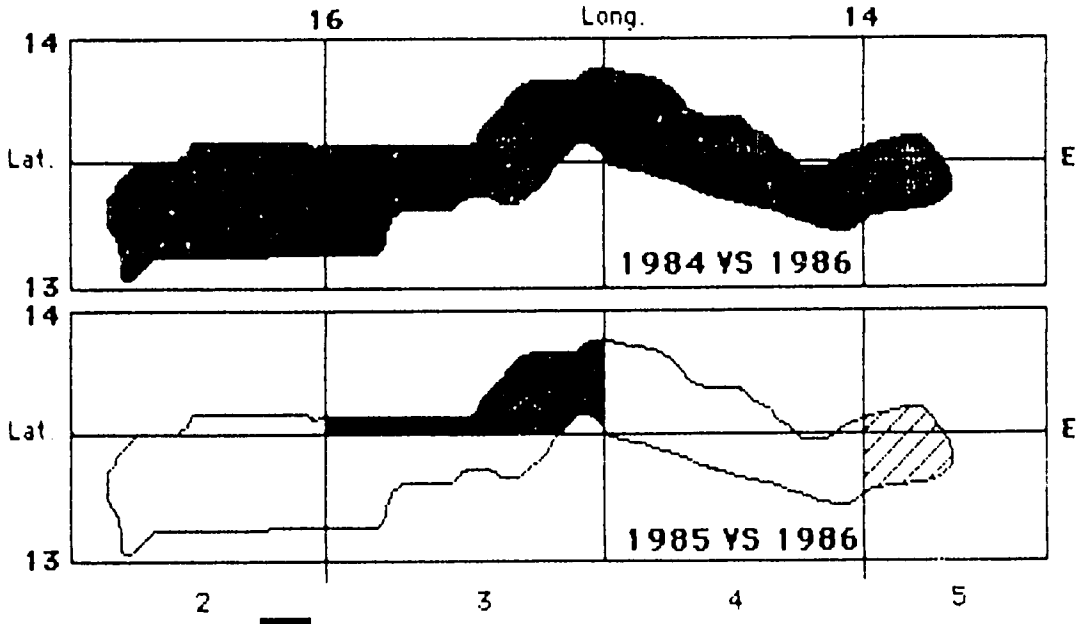
THE GAMBIA



NORMALIZED VEGETATION INDEX SCALE

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

DECREASING ← VEGETATION → INCREASING



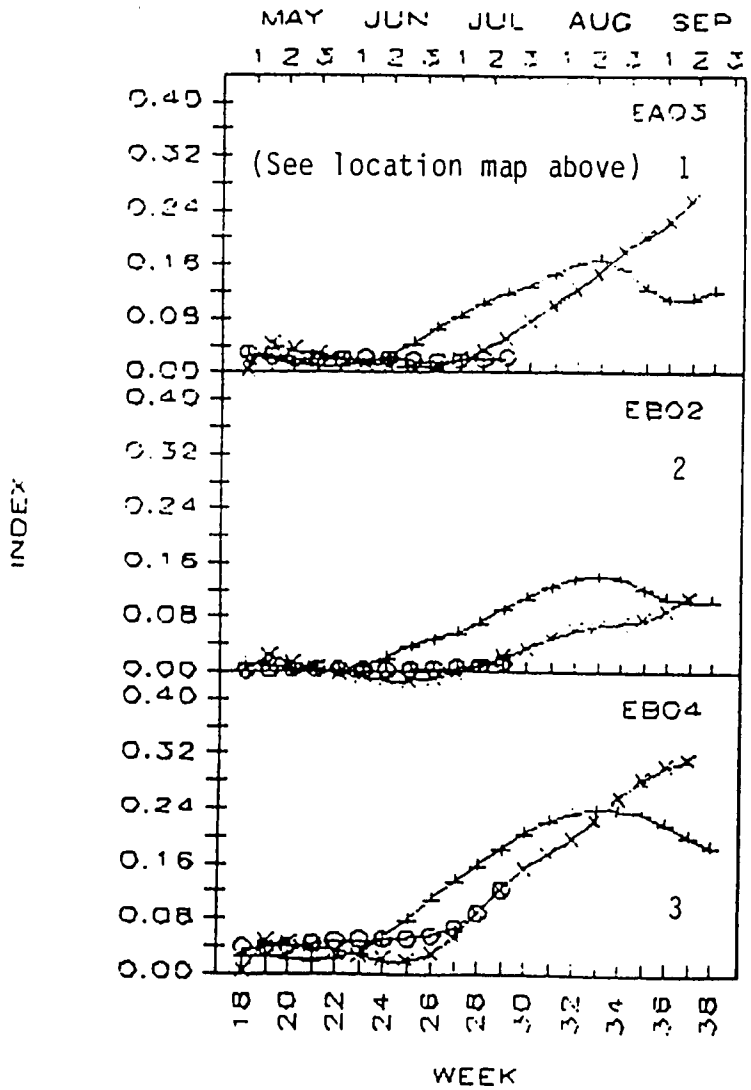
1986 LESS GREEN THAN PREVIOUS YEAR

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.

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Gambia Flag: Class I Year: 1986

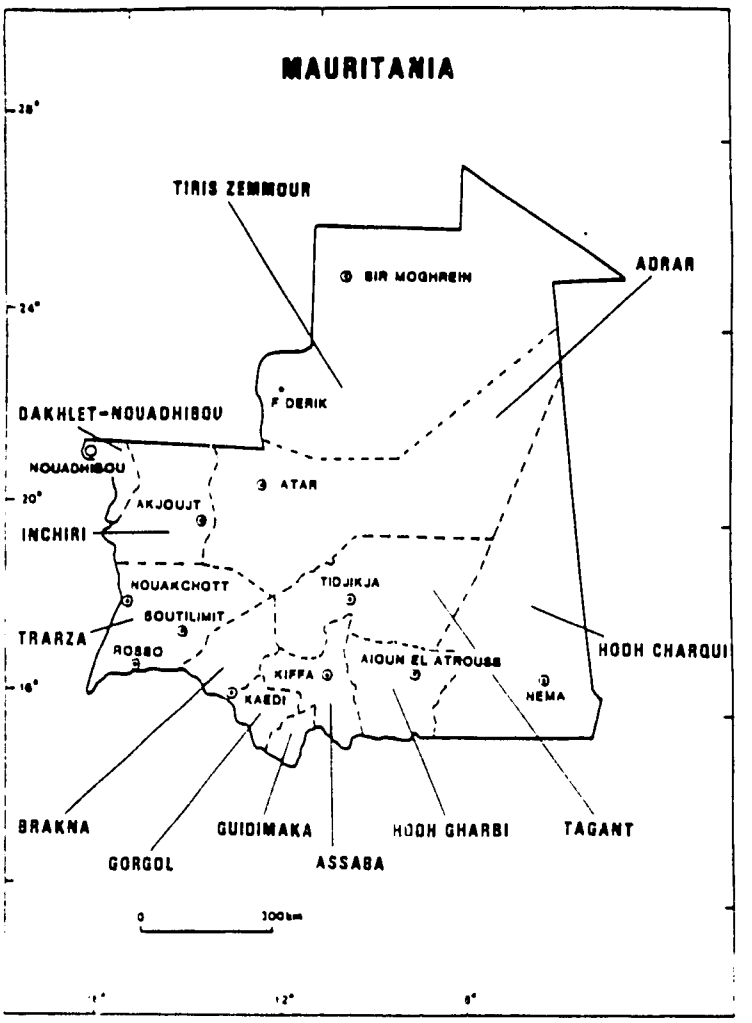
Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Basse Met	Dec	2	0	5	1	28	71	44	100							
	%-N	100	0	31	3	74	192	68	208							
	%-R	82	59	53	12	41	88	35	94							
	Cum	2	2	7	8	36	107	151	251							
	%-N	100	40	33	14	38	82	77	103							
	%-R	82	76	41	12	18	41	29	53							
Georgetown	Dec	0	0	2	0	10	59	84	110							
	%-N	0	0	40	0	31	155	171	180							
	%-R	76	81	71	24	52	76	90	81							
	Cum	0	0	2	2	12	71	155	265							
	%-N	0	0	25	6	18	68	101	123							
	%-R	76	67	62	19	14	29	57	76							
Jenoi Met	Dec	0	0	0	0	0	21	109	7							
	%-N	???	???	???	???	???	???	???	???							
	%-R	***	***	***	***	***	***	***	***							
	Cum	0	0	0	0	0	21	130	137							
	%-N	???	???	???	???	???	???	???	???							
	%-R	***	***	***	***	***	***	***	***							
Kerewan	Dec	0	0	0	0	0	33	33	77							
	%-N	???	???	???	???	???	???	???	???							
	%-R	***	***	***	***	***	***	***	***							
	Cum	0	0	0	0	0	33	66	143							
	%-N	???	???	???	???	???	???	???	???							
	%-R	***	***	***	***	***	***	***	***							
Yundum Airport	Dec	0	0	0	0	0	34	2	29							
	%-N	???	0	0	0	0	103	5	35							
	%-R	95	90	81	52	24	57	0	19							
	Cum	0	0	0	0	0	34	36	65							
	%-N	???	0	0	0	0	49	34	34							
	%-R	95	90	76	43	14	38	5	5							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

MAURITANIA ASSESSMENT



* Cereal production will likely be below last year's above-average levels. Moderate-to-heavy rains in central and eastern areas (from Guidimaka eastward) during the last third of July improved crop and pasture conditions, but July rainfall totaled less than normal throughout the production region. Potential yield reductions from last year are greatest in Guidimaka, Assaba, Hodh Gharbi, and southwestern Hodh Charqui departments.

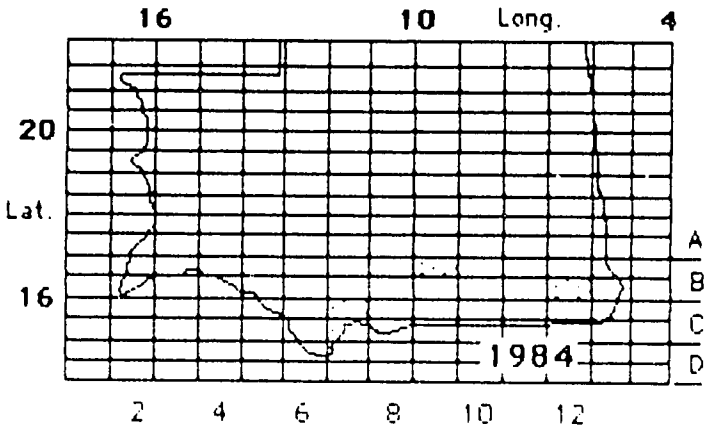
* Though vegetation imagery and indices were similar to the preceding two years during the third week of July (see NVI maps and time series), more recent data (not shown) indicate less vegetative growth than last year from Guidimaka eastward.

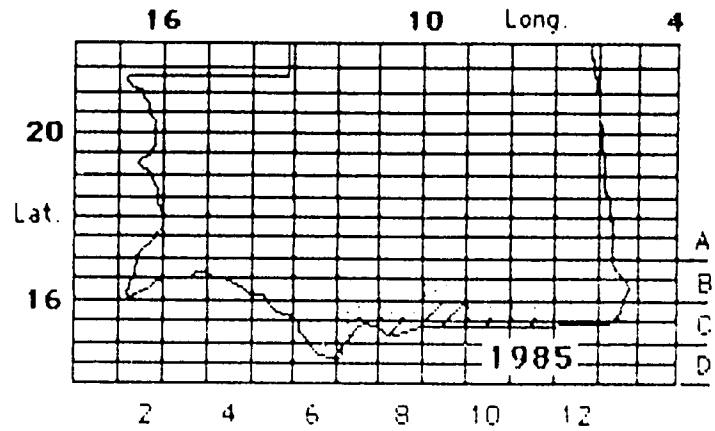
* Preliminary percentile rankings for season-to-date rainfall range from 10 to 20 --less than one in five years would be expected to be drier.

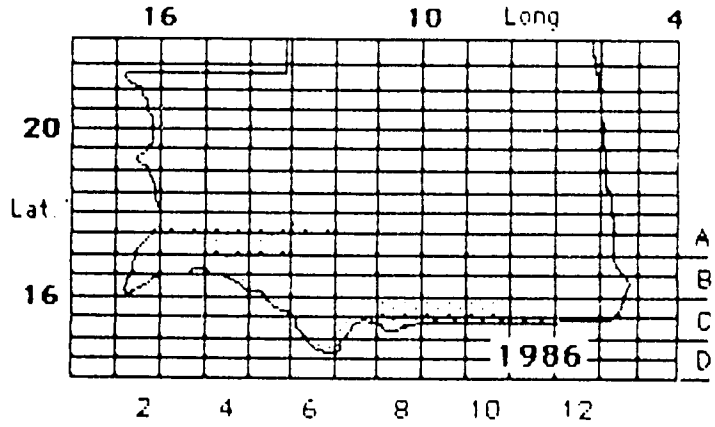
NOAA SATELLITE NORMALIZED VEGETATION INDEX

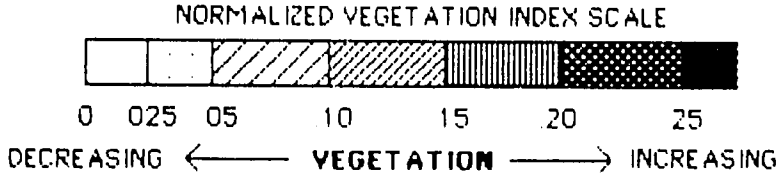
THIRD WEEK OF JULY

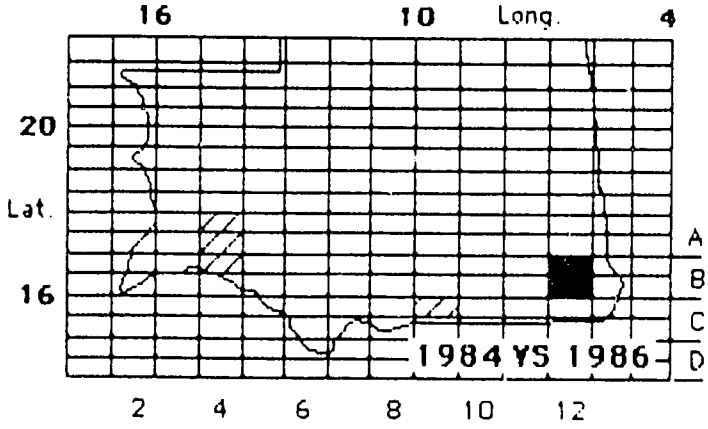
MAURITANIA

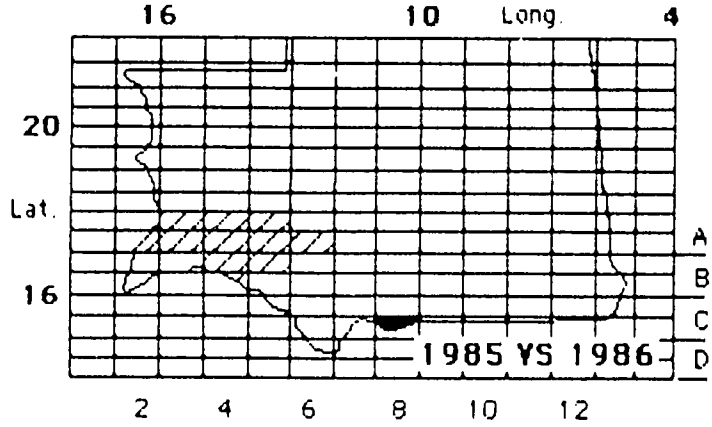












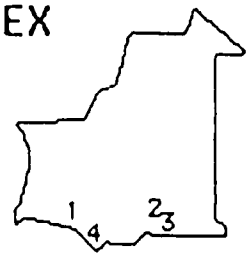
1986 LESS GREEN THAN PREVIOUS YEAR

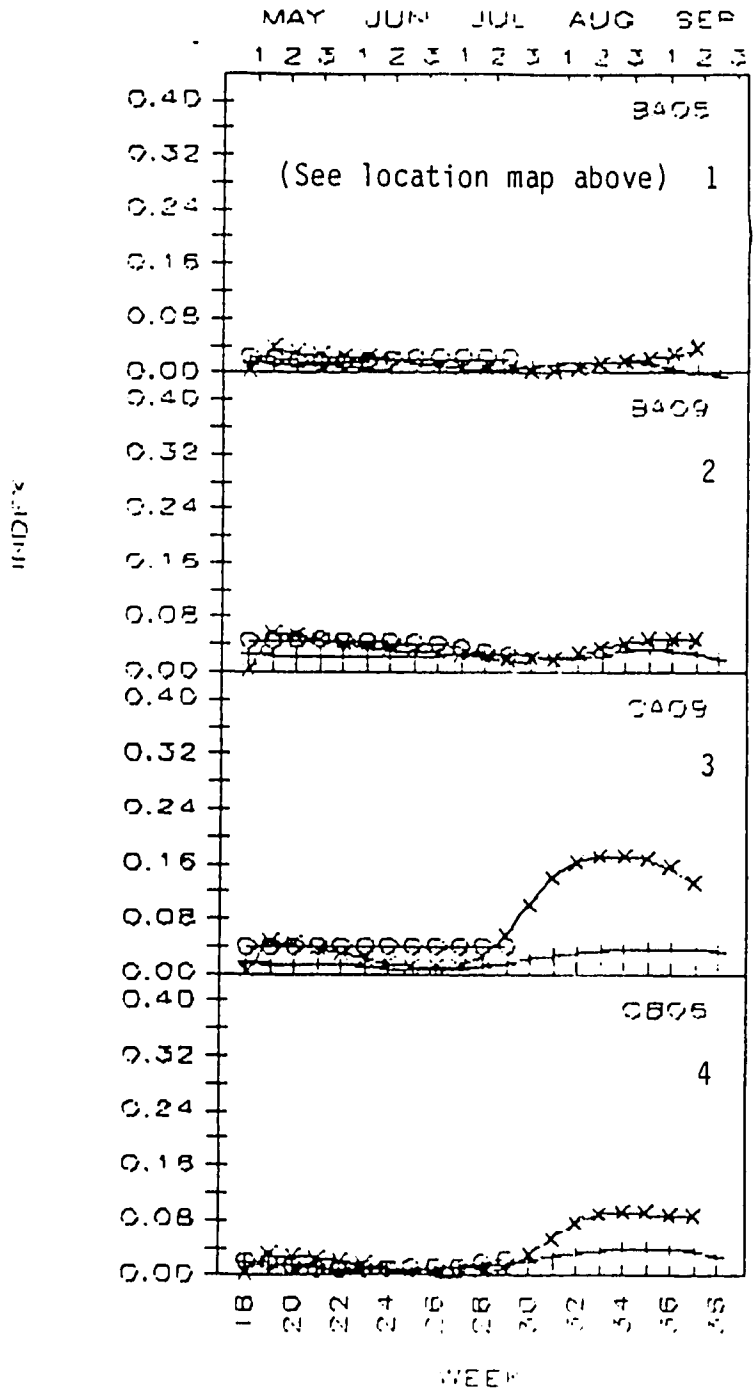
NO DIFFERENCE FROM PREVIOUS YEAR

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.

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Mauritania Flag: Class I Year: 1986

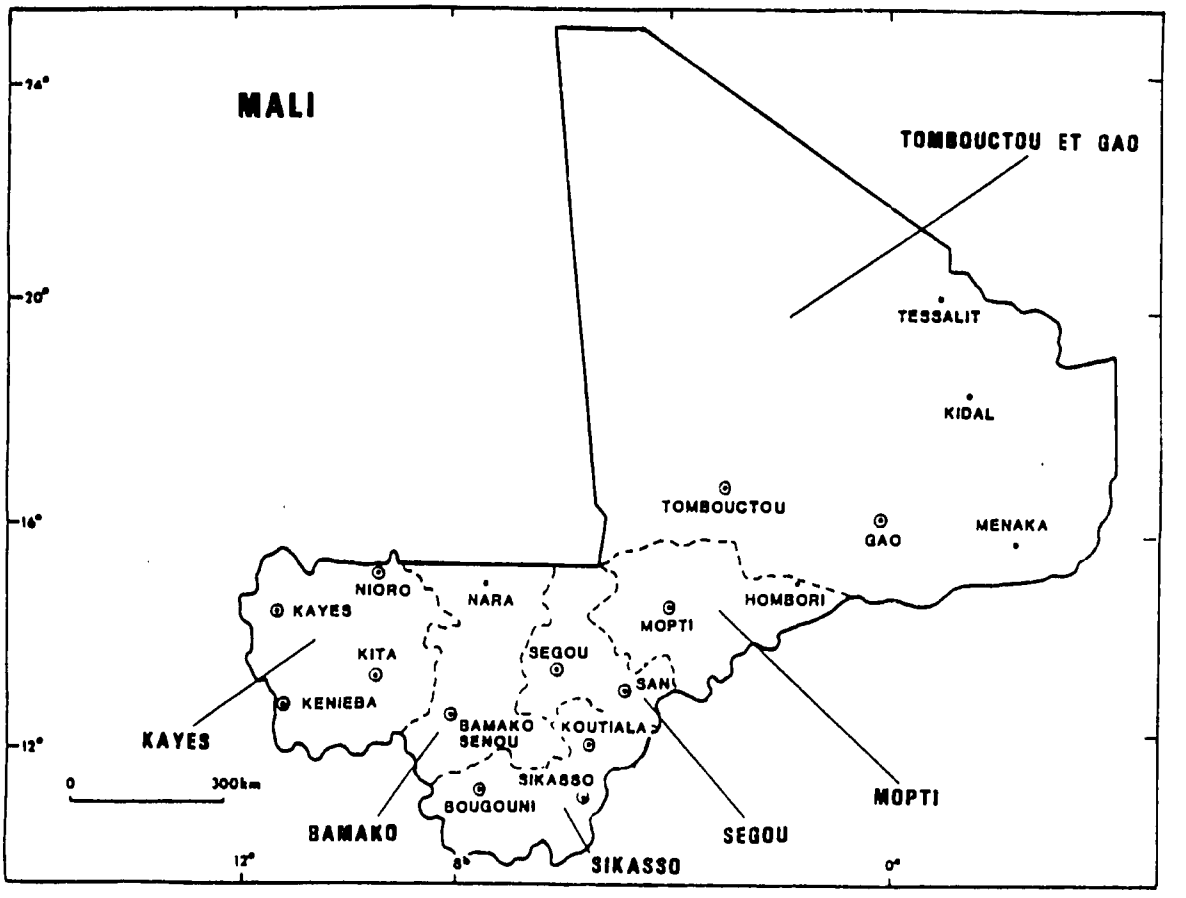
Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Aioun El Atrouss	Dec	0	0	0	0	2	0	15	22							
	%-N	0	0	0	0	33	0	188	96							
	%-R	76	76	67	67	48	29	90	62							
	Cum	0	0	0	0	2	2	17	39							
	%-N	0	0	0	0	17	13	71	83							
	%-R	76	57	38	29	24	14	57	57							
Kaedi IRAT	Dec	0	0	0	0	0	0	28	6							
	%-N	???	???	0	0	0	0	140	15							
	%-R	95	95	86	62	57	48	71	33							
	Cum	0	0	0	0	0	0	28	34							
	%-N	???	???	0	0	0	0	70	43							
	%-R	95	95	86	57	33	10	43	14							
Kiffa	Dec	0	0	0	0	0	0	10	9							
	%-N	???	???	0	0	0	0	67	45							
	%-R	86	86	81	52	38	29	67	48							
	Cum	0	0	0	0	0	0	10	19							
	%-N	???	???	0	0	0	0	25	32							
	%-R	86	76	62	33	5	5	14	14							
Nema	Dec	0	0	0	0	5	0	8	5							
	%-N	0	0	0	0	125	0	67	28							
	%-R	81	71	57	38	76	19	52	24							
	Cum	0	0	0	0	5	5	13	18							
	%-N	0	0	0	0	31	22	37	34							
	%-R	81	62	29	14	33	10	5	0							
Selibaby	Dec	0	0	0	0	0	0	43								
	%-N	0	0	0	0	0	0	110								
	%-R	81	76	57	38	14	24	52								
	Cum	0	0	0	0	0	0	43								
	%-N	0	0	0	0	0	0	45								
	%-R	81	67	38	14	0	0	14								

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

MALI ASSESSMENT



* Growing conditions remained good to excellent over the major crop areas. Heavy rains of more than 100 mm relieved dryness in northern areas of Kayes and Koulikoro during July 21-31, but the moisture could have aggravated locust and grasshopper problems. Seasonal rains of 25-70 mm improved growing conditions from Mopti eastward towards Menaka.

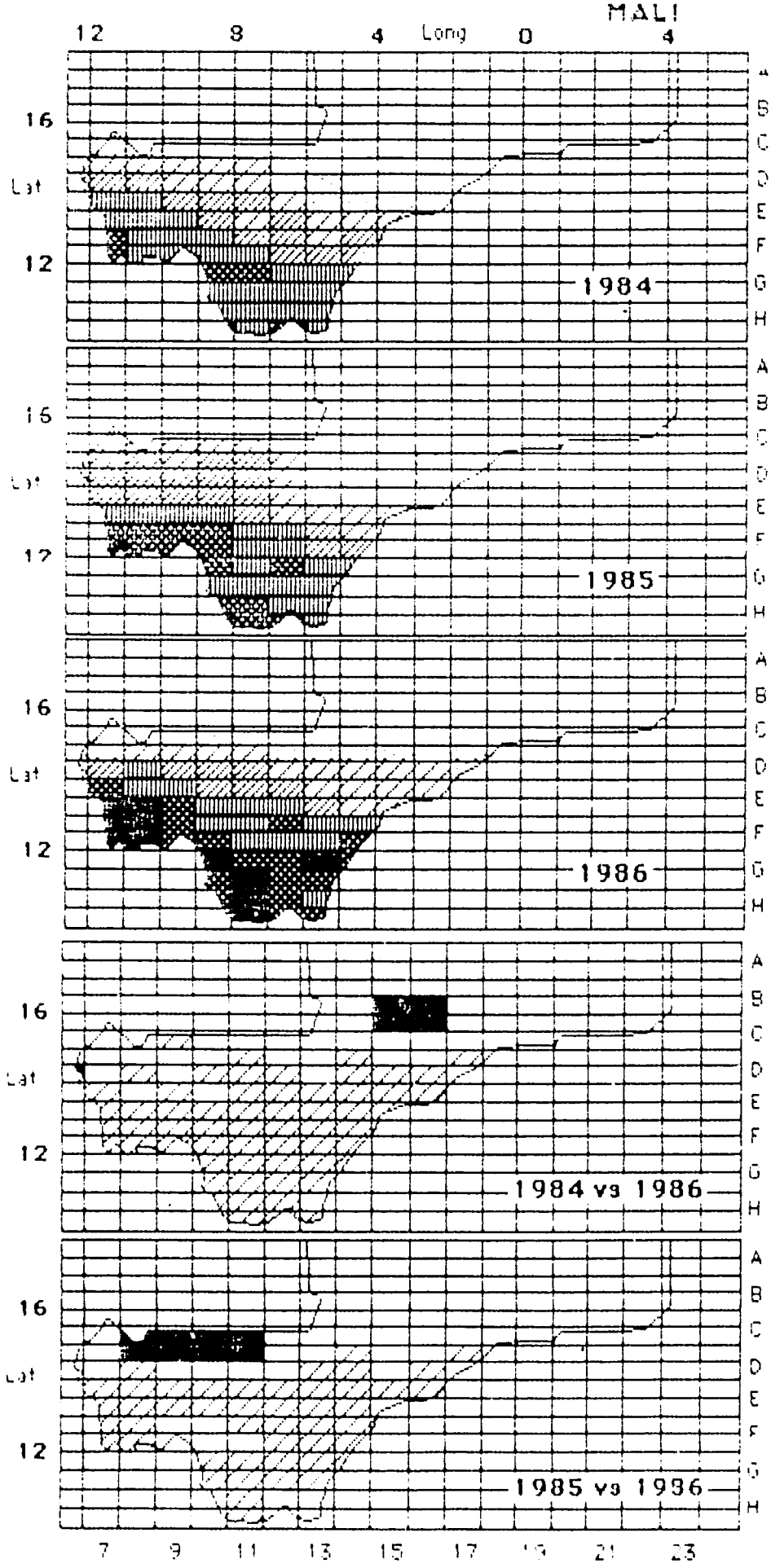
* Dryness hampered early development of crops in northern Kayes and northern Koulikoro. Satellite images and NVI values show low biomass in this region. Though recent heavy rains improved growing conditions, some reduction in yields due to earlier dryness is likely.

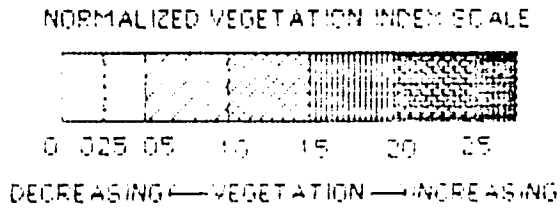
* The southern half of Kayes and Koulikoro, the lower third of Segou, and all of Sikasso showed increased biomass during July. Vegetation growth in this region is better than in 1985 or 1984. July rainfall was below normal in this region but mostly adequate for plant development.

NOAA SATELLITE NORMALIZED VEGETATION INDEX

THIRD WEEK OF JULY

MALI





1986 LESS GREEN

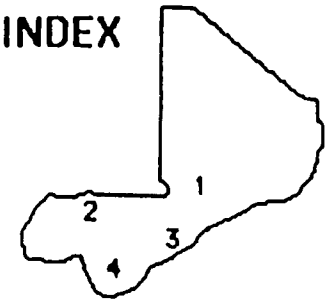
NO DIFFERENCE

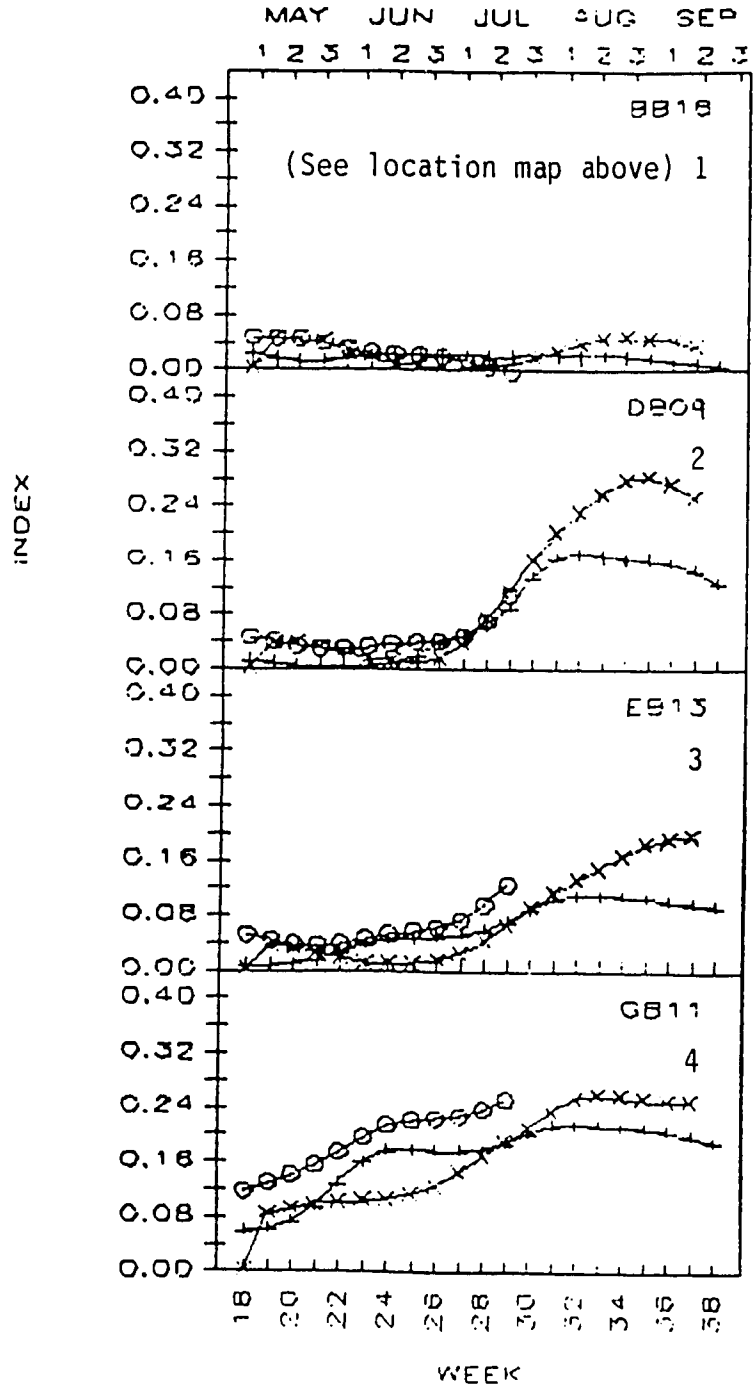
1986 GREENER

NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

MALI

+ = 1984
* = 1985
0 = 1986





*NOTE: These grid indicators match NVI grid indicators.

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Mali Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Bamako/Senou	Dec	3	9	20	49	41	80	19	66							
	%-N	33	56	111	129	98	200	29	83							
	%-R	***	***	***	***	***	***	***	***							
	Cum	3	12	32	81	122	202	221	287							
	%-N	33	48	74	100	99	124	97	93							
	%-R	***	***	***	***	***	***	***	***							
Bougouni	Dec	5	82	29	68	79	69	17	50							
	%-N	13	328	69	184	134	130	23	58							
	%-R	14	95	38	90	67	71	5	24							
	Cum	5	87	116	184	263	332	349	399							
	%-N	13	138	110	130	131	131	106	96							
	%-R	14	71	62	76	81	81	57	48							
Gao	Dec	0	0	0	1	0	3	24	0							
	%-N	0	0	0	100	0	50	300	0							
	%-R	71	57	57	86	5	57	86	5							
	Cum	0	0	0	1	1	4	28	28							
	%-N	0	0	0	11	4	13	70	42							
	%-R	71	38	19	19	5	5	38	10							
Kayes	Dec	1	0	22	7	28	30	68	18							
	%-N	100	0	244	33	117	79	166	29							
	%-R	76	43	81	48	67	43	76	14							
	Cum	1	1	23	30	58	88	156	174							
	%-N	100	17	153	83	97	90	112	87							
	%-R	76	38	71	48	52	43	62	38							
Kenieba	Dec	12	64	40	29	18	46	88	58							
	%-N	92	492	138	60	31	74	152	79							
	%-R	71	90	67	38	5	33	81	38							
	Cum	12	76	116	145	163	209	297	355							
	%-N	92	292	211	141	101	93	105	100							
	%-R	71	86	90	76	43	38	48	52							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Mali Flag: Class 1 Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Kita	Dec	1	9	49	27	24	23	66	107							
	%-N	17	113	204	55	49	43	143	151							
	%-R	43	71	86	38	19	10	76	81							
	Cum	1	10	59	86	110	133	199	306							
	%-N	17	71	155	99	81	70	84	100							
	%-R	43	52	86	43	29	24	24	57							
Koutiala	Dec	0	13	69	6	37	20	72	38							
	%-N	0	72	230	17	84	42	138	54							
	%-R	10	48	86	1[illegible]	48	10	76	24							
	Cum	0	13	82	88	125	145	217	255							
	%-N	0	31	114	81	82	73	86	79							
	%-R	10	10	57	33	33	14	38	19							
Menaka	Dec	0	0	2	0	16	2	6	26							
	%-N	0	0	100	0	320	18	50	118							
	%-R	81	71	67	38	81	29	24	57							
	Cum	0	0	2	2	18	20	26	52							
	%-N	0	0	33	15	100	69	63	83							
	%-R	81	62	33	24	52	38	24	38							
Mopti	Dec	0	0	11	5	16	30	17	60							
	%-N	0	0	55	29	73	150	68	113							
	%-R	43	33	43	19	57	67	43	62							
	Cum	0	0	11	16	32	62	79	139							
	%-N	0	0	34	33	45	68	68	82							
	%-R	43	14	24	10	14	19	19	38							
Nara	Dec	0	1	0	2	0	31	10	30							
	%-N	0	25	0	20	0	172	36	71							
	%-R	***	***	***	***	***	***	***	***							
	Cum	0	1	1	3	3	34	44	74							
	%-N	0	11	7	12	7	58	51	57							
	%-R	***	***	***	***	***	***	***	***							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Mali Flag: Class I Year: 1986

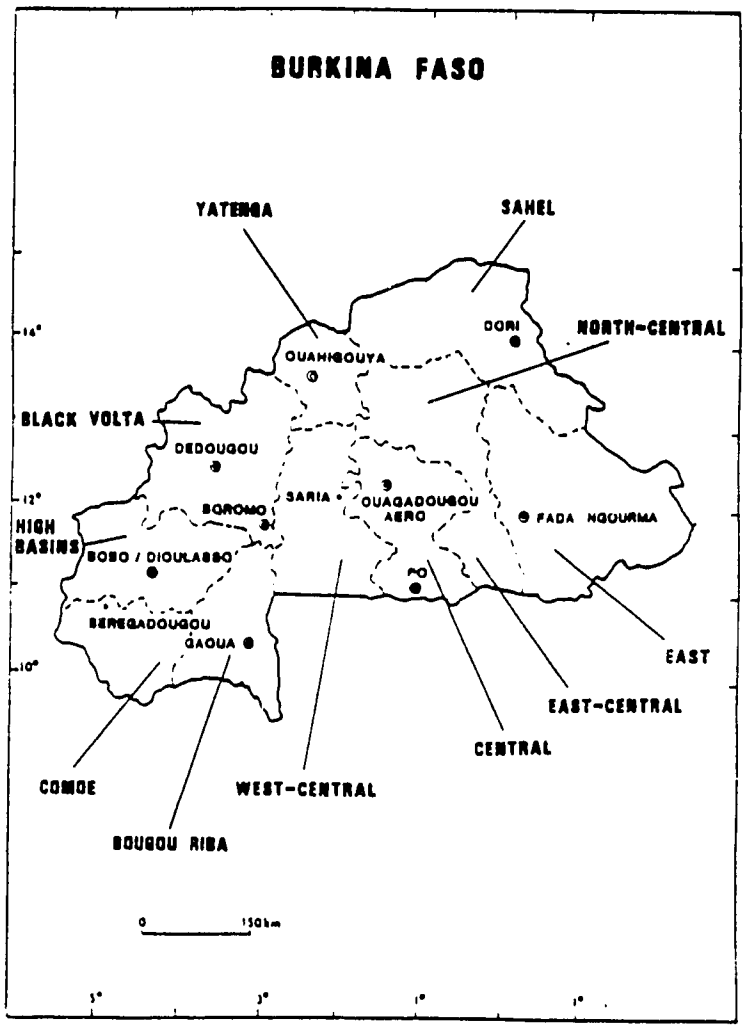
Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Nioro du Sahel	Dec	0	0	0	16	25	0	43	3							
	%-N	0	0	0	145	200	0	119	7							
	%-R	52	62	48	62	81	0	57	0							
	Cum	0	0	0	16	41	41	84	87							
	%-N	0	0	0	80	128	73	91	64							
	%-R	52	33	14	38	67	38	43	19							
San	Dec	0	3	21	16	95	54	68	73							
	%-N	0	43	100	52	352	159	145	114							
	%-R	19	48	52	43	95	81	81	52							
	Cum	0	3	24	40	135	189	257	330							
	%-N	0	16	60	56	138	143	144	136							
	%-R	19	10	29	29	67	71	90	90							
Segou	Dec	0	71	29	21	32	12	38	68							
	%-N	0	710	193	91	133	43	119	110							
	%-R	33	95	76	43	71	24	71	57							
	Cum	0	71	100	121	153	165	203	271							
	%-N	0	323	270	202	182	147	141	132							
	%-R	33	95	95	90	90	81	86	86							
Sikasso	Dec	6	49	78	36	41	38	43	30							
	%-N	25	158	181	71	82	72	81	42							
	%-R	29	86	81	24	48	33	38	10							
	Cum	6	55	133	169	210	248	291	321							
	%-N	25	100	136	113	106	98	95	85							
	%-R	29	48	76	48	62	48	43	19							
Tombouctou	Dec	0	0	26	0	0	0	1	24							
	%-N	???	0	1300	0	0	0	14	185							
	%-R	90	62	95	43	24	38	33	86							
	Cum	0	0	26	26	26	26	27	51							
	%-N	???	0	867	325	236	153	113	138							
	%-R	90	57	95	90	90	81	62	76							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

BURKINA FASO ASSESSMENT



* Growing conditions are good to excellent over major crop areas, but some crop losses are expected in the north and east, particularly in the northeast near Dori. July rainfall was under 50 percent of normal over northern and eastern parts of the country. Reduced cereal yields are likely from Ouahigouya (Yatenga Department) eastward to around Dori (Sahel Department, including Soum), and also Centre Est and the southern half of Est.

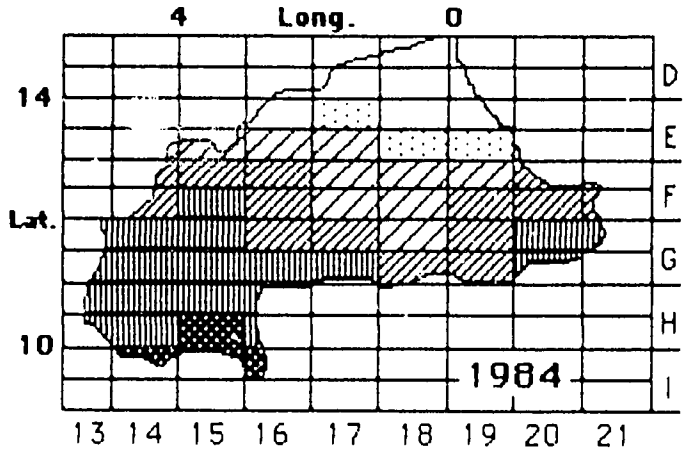
* May-July cumulative rainfall around Dori has been among the lowest of the past 30 years (near the 10th percentile). In recent years, only 1984 and 1985 have been drier.

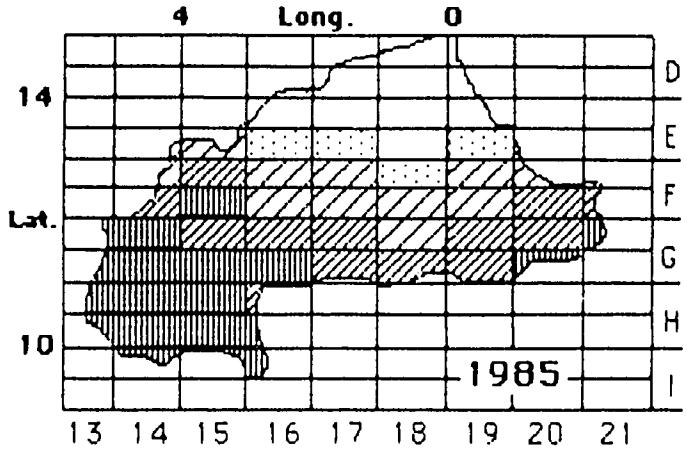
* Grasshopper outbreaks have been reported in the northern departments around Bogande, Ouahigouya, and Djibo.

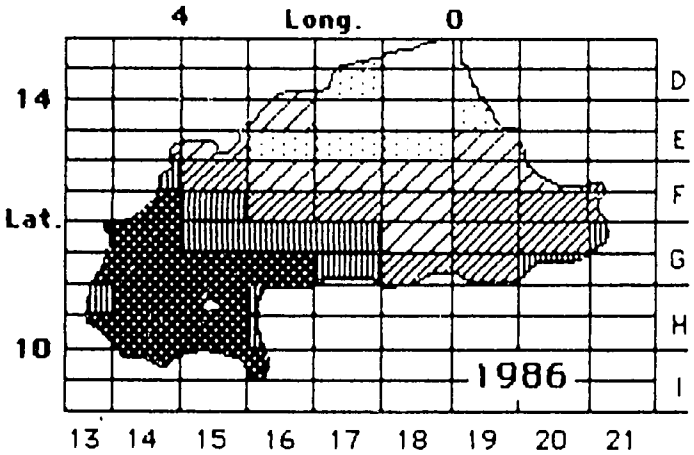
NOAA SATELLITE NORMALIZED VEGETATION INDEX

THIRD WEEK OF JULY

BURKINA FASO



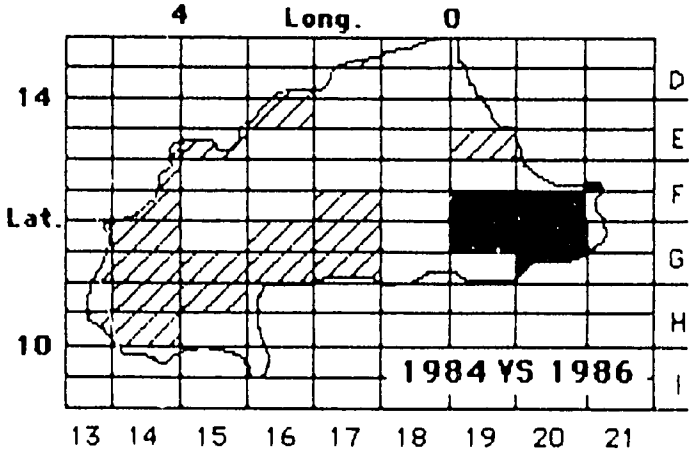


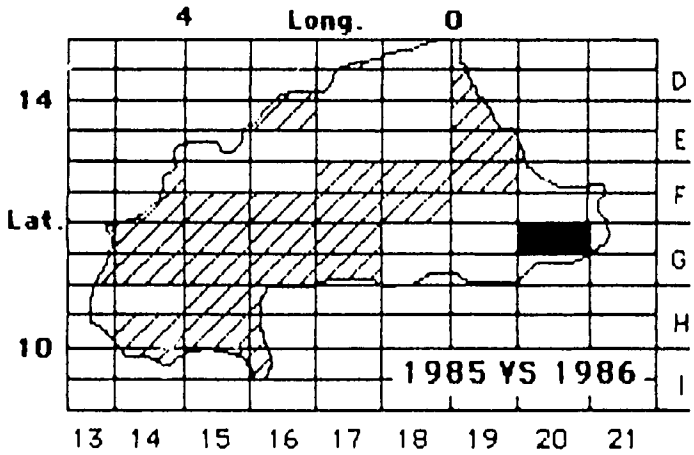


NORMALIZED VEGETATION INDEX SCALE

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

DECREASING ⟵ **VEGETATION** ⟶ INCREASING



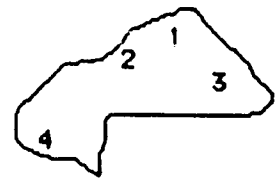


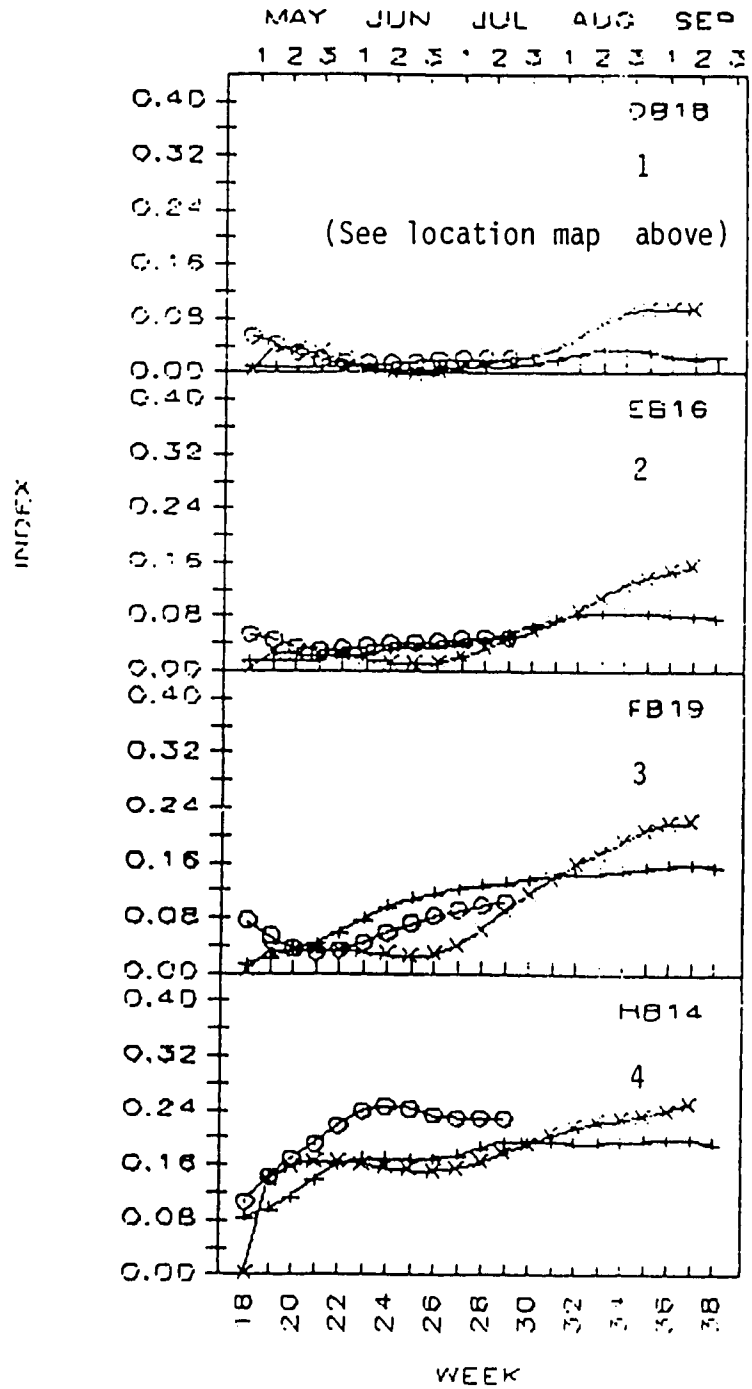
- ■ 1986 LESS GREEN THAN PREVIOUS YEAR
- □ NO DIFFERENCE FROM PREVIOUS YEAR
- ▨ 1986 GREENER THAN PREVIOUS YEAR

NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

BURKINA FASO

+ = 1984
* = 1985
O = 1986





*NOTE: These grid indicators match NVI grid indicators.

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Burkina Faso Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Bobo-Dioulasso	Dec	30	12	42	6	31	42	45	96							
	%-N	111	48	98	19	61	102	83	135							
	%-R	57	33	52	14	24	52	48	76							
	Cum	30	42	84	90	121	163	208	304							
	%-N	111	81	88	71	68	75	76	89							
	%-R	57	57	48	29	19	19	14	38							
Boromo	Dec	11	39	101	1	48	35	6	67							
	%-N	55	170	281	3	114	83	13	96							
	%-R	43	81	90	5	57	38	0	48							
	Cum	11	50	151	152	200	235	241	308							
	%-N	55	116	191	133	128	119	98	98							
	%-R	43	62	95	76	76	71	57	48							
Dedougou	Dec	20	40	61	13	80	23	88	21							
	%-N	111	250	169	42	267	53	176	34							
	%-R	57	90	76	24	95	14	86	14							
	Cum	20	60	121	134	214	237	325	346							
	%-N	111	176	173	133	163	136	145	121							
	%-R	57	86	86	71	86	81	86	76							
Dori	Dec	19	0	0	10	37	4	10	5							
	%-N	271	0	0	53	137	11	26	13							
	%-R	81	14	24	43	71	14	10	0							
	Cum	19	19	19	29	66	70	80	85							
	%-N	271	127	73	64	92	64	54	45							
	%-R	81	62	33	48	43	33	19	5							
Fada-N'Gourma	Dec	2	1	20	6	28	86	16	40							
	%-N	7	4	95	17	67	205	33	49							
	%-R	10	0	52	5	29	90	10	14							
	Cum	2	3	23	29	57	143	159	199							
	%-N	7	6	31	27	38	74	66	62							
	%-R	10	0	5	0	0	24	5	0							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Burkina Faso Flag: Class I Year: 1986

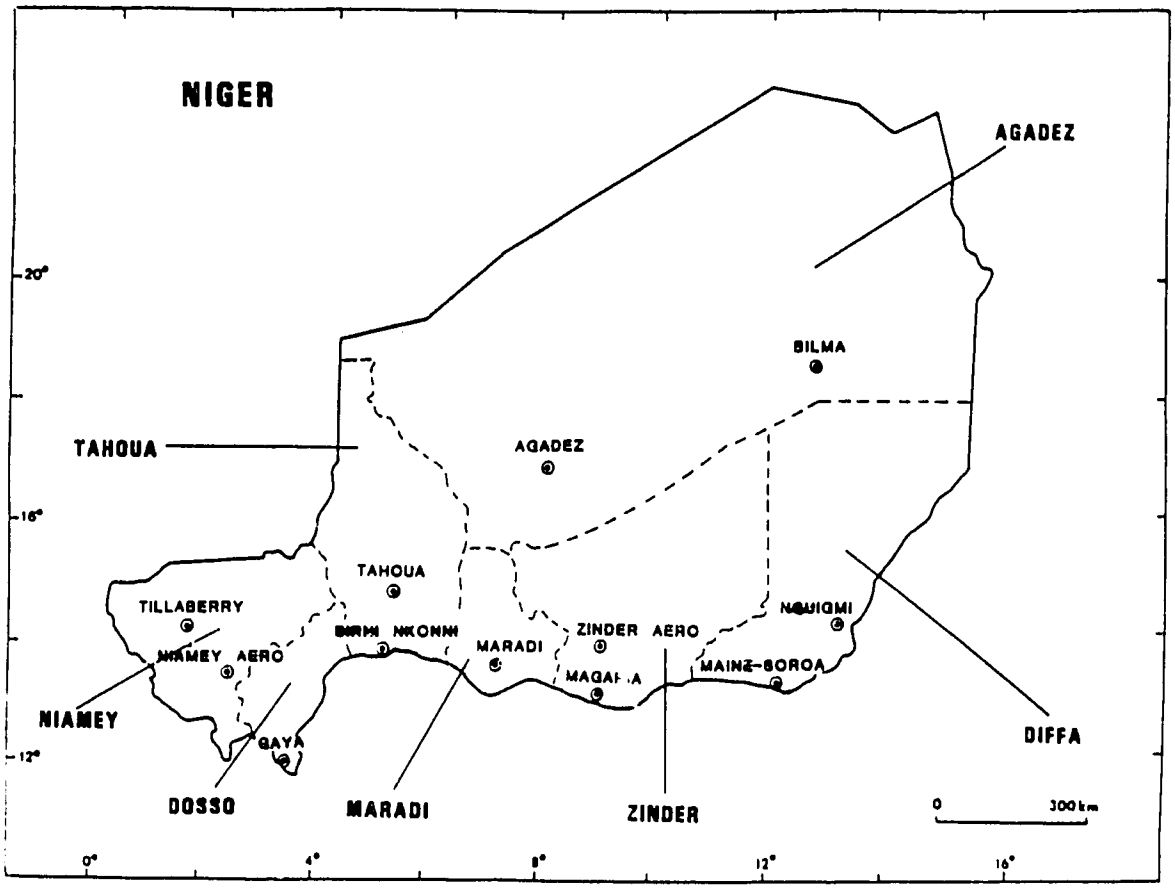
Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Gaoua	Dec	46	34	42	57	14	30	78	89							
	%-N	139	89	95	139	23	68	142	137							
	%-R	76	48	48	81	5	33	71	76							
	Cum	46	80	122	179	193	223	301	390							
	%-N	139	113	106	115	89	85	95	102							
	%-R	76	62	52	62	29	29	38	52							
Ouagadougou Aeroport	Dec	25	33	27	12	67	52	89	25							
	%-N	139	183	79	35	203	106	202	42							
	%-R	67	81	48	14	81	57	95	5							
	Cum	25	58	85	97	164	216	305	330							
	%-N	139	161	121	93	120	116	133	114							
	%-R	67	71	62	48	71	76	81	67							
Ouahigouya	Dec	15	3	22	4	81	16	82	29							
	%-N	250	50	183	19	245	48	178	46							
	%-R	86	43	76	24	90	33	86	29							
	Cum	15	18	40	44	125	141	223	252							
	%-N	250	150	167	98	160	127	142	115							
	%-R	86	67	76	43	81	7[illegible]	90	67							
Po	Dec	42	3	20	26	48	33	26	98							
	%-N	200	11	61	67	104	73	54	166							
	%-R	86	14	43	35	60	50	33	81							
	Cum	42	45	65	91	139	172	198	296							
	%-N	200	92	79	75	83	81	76	93							
	%-R	86	52	38	40	30	35	25	50							
Saria	Dec	50	40	83	44	71	39	37	30							
	%-N	294	182	277	169	197	87	88	52							
	%-R	85	85	95	80	85	45	50	30							
	Cum	50	90	173	217	288	327	364	394							
	%-N	294	231	251	228	220	186	167	143							
	%-R	85	90	95	95	95	95	95	90							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

NIGER ASSESSMENT



* Crop and pasture conditions are below normal in parts of Niamey and Tahoua Departments in the west. Yield losses are likely near Tillabery and another area near Niamey, as late July rainfall was light and monthly totals were well below normal. August rainfall will be especially important in Niamey Department, which is a major cereal-producing area. A localized dry area is located to the east near the town of Tahoua. Conditions elsewhere in Niger are similar to or better than last year.

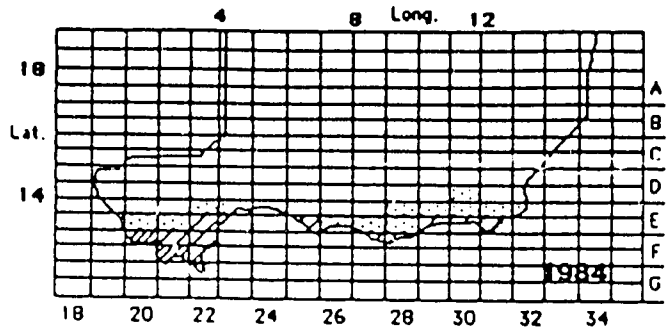
* Vegetative growth (see NVI maps and time series) has been better than in the preceding two years in key growing areas from western Zinder westward to Tahoua.

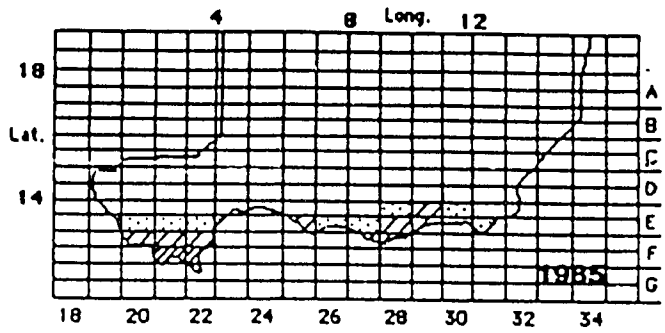
* In Niamey Department, extremely dry conditions prevail from Tillabery westward to the Burkina border and northward to the Mali border. July rainfall was less than 25 percent of normal in this area, which is mostly pastoral.

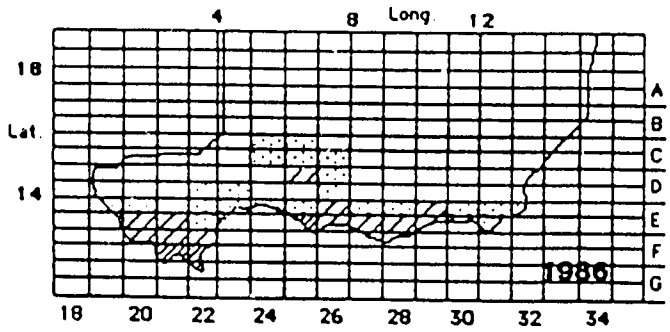
NOAA SATELLITE NORMALIZED VEGETATION INDEX

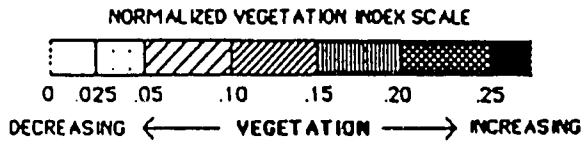
THIRD WEEK OF JULY

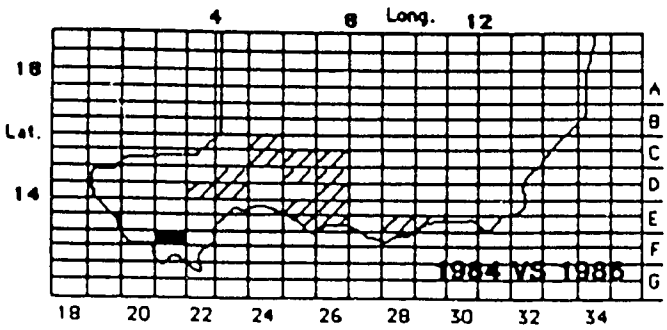
NIGER

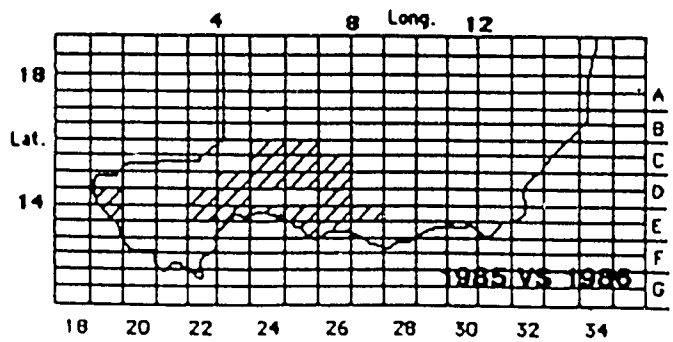












1986 LESS GREEN THAN PREVIOUS YEAR

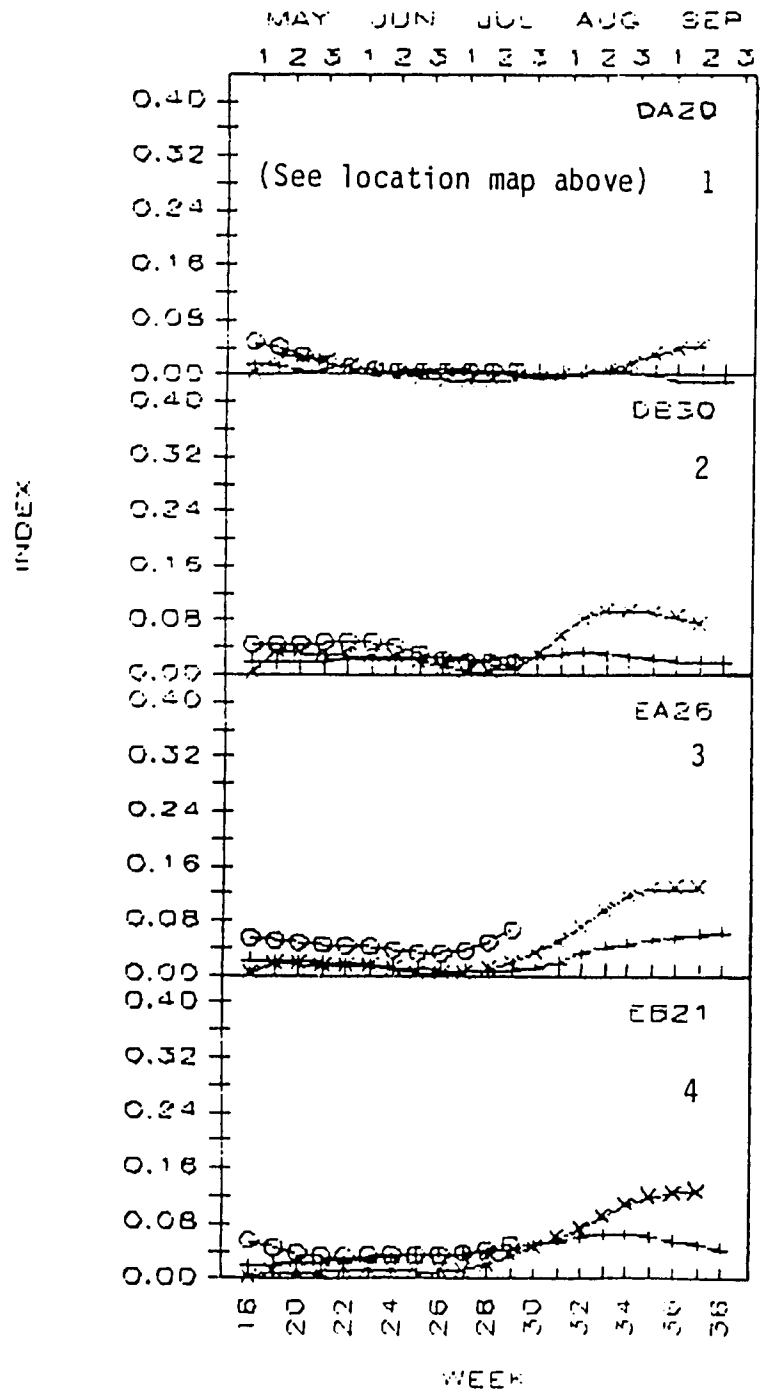
NO DIFFERENCE FROM PREVIOUS YEAR

1986 GREENER THAN PREVIOUS YEAR

NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

NIGER

+ = 1984
* = 1985
O = 1986



*NOTE: These grid indicators match NVI grid indicators.

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Niger Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Birni N'Konni	Dec	3	0	1	0	26	39	16	33							
	%-N	50	0	6	0	81	177	47	100							
	%-R	62	29	43	10	52	86	24	48							
	Cum	3	3	4	4	30	69	85	118							
	%-N	50	23	13	9	38	68	63	70							
	%-R	62	33	10	5	19	33	10	14							
Gaya	Dec	6	9	32	46	45	32	114	6							
	%-N	35	64	78	112	100	73	204	12							
	%-R	29	48	43	62	43	33	81	5							
	Cum	6	15	47	93	138	170	284	290							
	%-N	35	48	65	82	87	84	110	94							
	%-R	29	19	24	43	43	33	62	38							
Magaria	Dec	0	5	1	0	1	21	55	96							
	%-N	0	56	9	0	6	68	115	196							
	%-R	50	56	33	21	6	44	44	83							
	Cum	0	5	6	6	7	28	83	179							
	%-N	0	26	20	14	11	30	59	95							
	%-R	50	22	17	0	0	6	12	47							
Maine-Soroa	Dec	0	0	0	0	0	31	9	12							
	%-N	0	0	0	0	0	238	36	29							
	%-R	67	57	43	29	38	90	33	14							
	Cum	0	0	0	0	0	31	40	52							
	%-N	0	0	0	0	0	82	63	50							
	%-R	67	43	10	0	0	43	33	10							
Maradi Aeroport	Dec	0	1	1	0	39	38	29	103							
	%-N	0	17	10	0	139	165	100	198							
	%-R	52	48	38	5	67	71	48	90							
	Cum	0	1	2	2	41	79	108	211							
	%-N	0	11	11	5	63	90	92	125							
	%-R	52	29	14	5	29	43	52	71							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Niger Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
N'Guigmi	Dec	0	0	0	2	1	22	12	18							
	%-N	0	???	0	200	50	440	240	113							
	%-R	76	90	76	81	81	90	81	76							
	Cum	0	0	0	2	3	25	37	55							
	%-N	0	0	0	33	38	192	206	162							
	%-R	76	71	57	57	62	81	81	76							
Niamey Aeroport	Dec	0	0	61	4	13	21	34	37							
	%-N	0	0	407	16	54	84	87	64							
	%-R	29	29	90	24	33	48	52	24							
	Cum	0	0	61	65	78	99	133	170							
	%-N	0	0	197	116	98	94	92	84							
	%-R	29	10	76	52	43	38	33	33							
Tahoua	Dec	0	0	2	10	30	18	3	41							
	%-N	0	0	18	48	125	90	10	117							
	%-R	29	43	38	48	76	52	5	62							
	Cum	0	0	2	12	42	60	63	104							
	%-N	0	0	12	32	67	72	56	71							
	%-R	29	14	10	33	38	38	5	14							
Tillaberi	Dec	0	2	1	2	28	4	37	14							
	%-N	0	67	8	17	127	19	119	45							
	%-R	48	67	29	29	67	19	62	14							
	Cum	0	2	3	5	33	37	74	88							
	%-N	0	33	16	16	62	50	70	65							
	%-R	48	48	19	5	38	14	29	19							
Zinder Aeroport	Dec	0	33	0	0	36	6	55	9							
	%-N	0	1650	0	0	240	33	134	22							
	%-R	67	95	29	14	81	43	67	14							
	Cum	0	33	33	33	69	75	130	139							
	%-N	0	825	236	132	173	129	131	99							
	%-R	67	95	90	76	81	62	71	43							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

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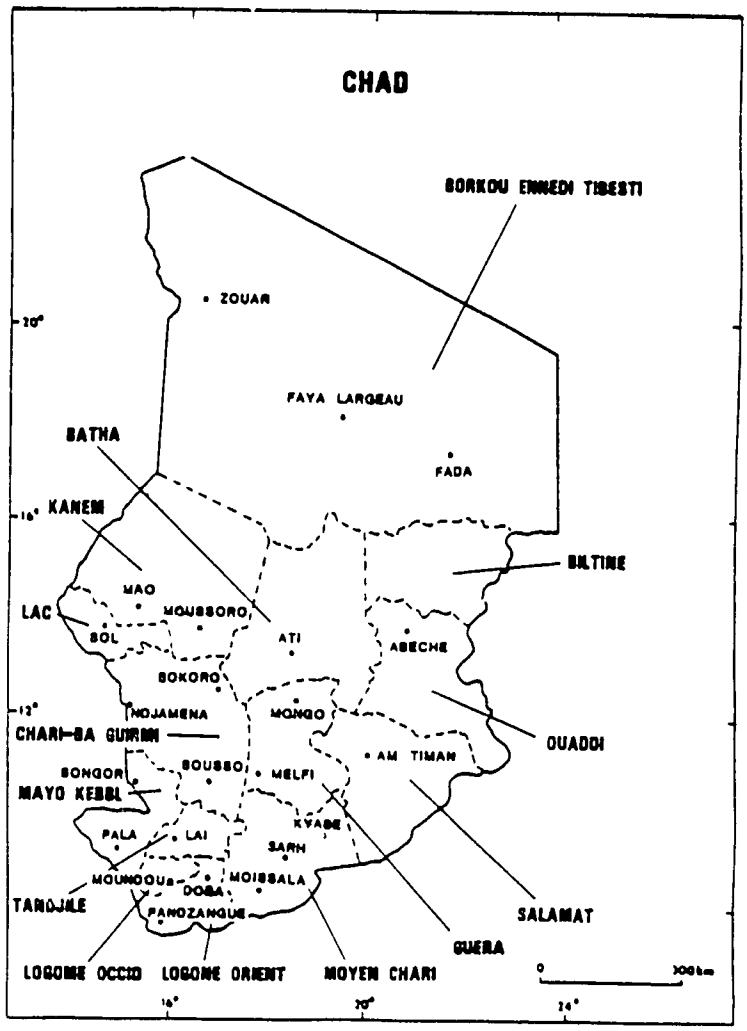
CHAD ASSESSMENT



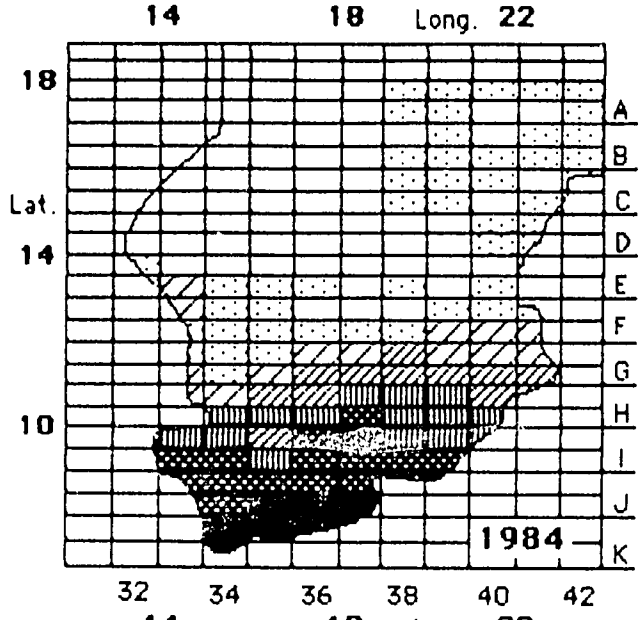
* Crop and pasture conditions improved to good-to-excellent in most areas. Near normal July rainfall promoted vegetative growth, which is now as good or better than in the two previous years. However, plant growth is still lagging in portions of the south, particularly in southern Moyen Chari, where the condition of early-planted crops may still be below average.

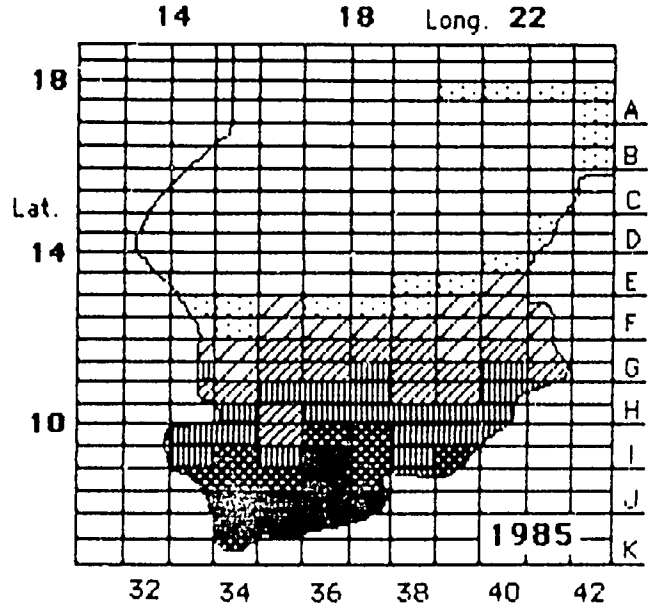
* In southern Moyen Chari, vegetative conditions are poorer than in the two previous years. However, growth is increasing, and further rains would greatly benefit crops as they enter the reproductive stage.

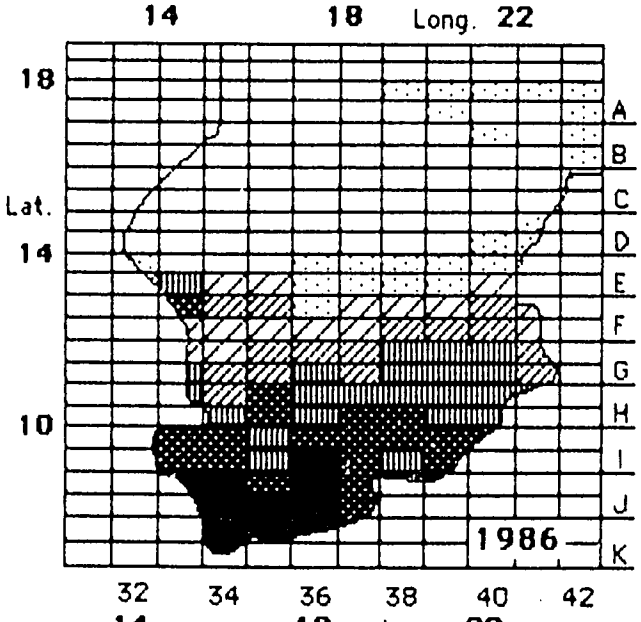
NOAA SATELLITE NORMALIZED VEGETATION INDEX

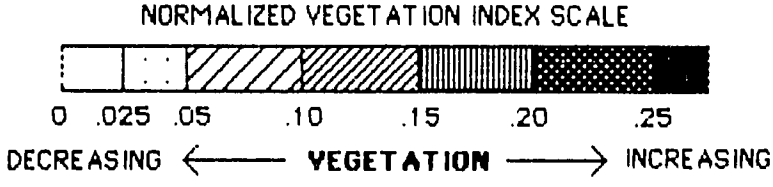
THIRD WEEK OF JULY

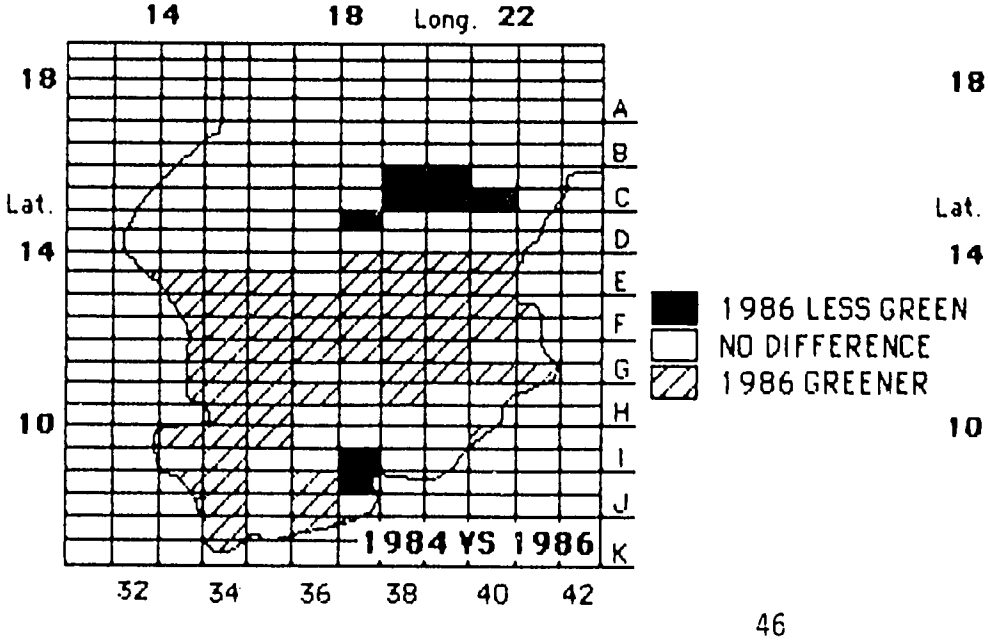
CHAD

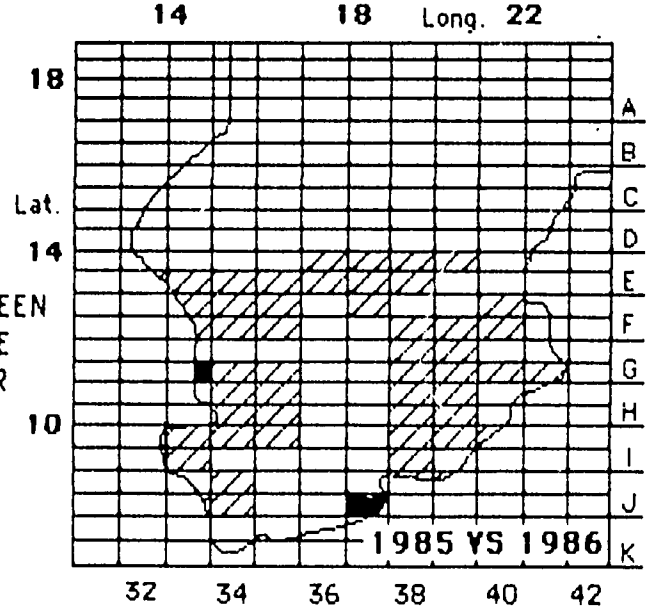








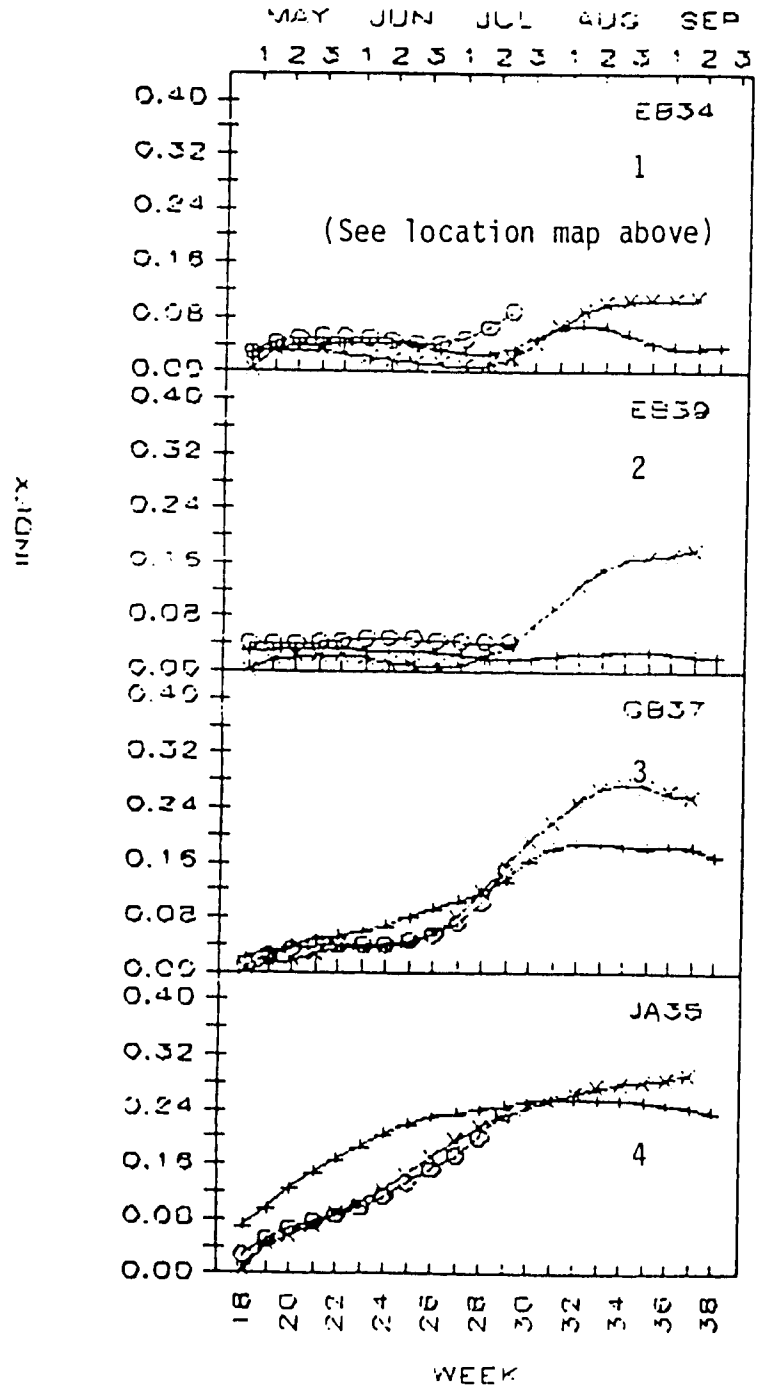




NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

CHAD

+ = 1984
* = 1985
O = 1986



*NOTE: These grid indicators match NVI grid indicator

Decadal and Cumlative Decadal Rainfall Analysis

Area: Sahel of Africa Country: Chad Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Guelendeng	Dec	11	0	14	4	6	27	107								
	%-N	???	???	???	???	???	???	???								
	%-R	***	***	***	***	***	***	***								
	Cum	11	11	25	29	35	62	169								
	%-N	???	???	???	???	???	???	???								
	%-R	***	***	***	***	***	***	***								
Mongo	Dec	11	6	6	23	5	11	29	50							
	%-N	110	86	30	77	17	31	63	102							
	%-R	58	63	26	53	21	16	21	42							
	Cum	11	17	23	46	51	62	91	141							
	%-N	110	100	62	69	53	47	51	62							
	%-R	58	53	32	37	16	21	11	16							
Moundou	Dec	19	14	17	44	40	35	172	45							
	%-N	66	44	39	138	71	64	273	50							
	%-R	47	26	26	68	42	21	95	26							
	Cum	19	33	50	94	134	169	341	386							
	%-N	66	54	48	69	69	68	110	96							
	%-R	47	32	5	16	16	16	58	42							
N'Djamena	Dec	17	0	0	4	2	9	65	90							
	%-N	340	0	0	20	13	39	203	200							
	%-R	84	21	16	42	16	21	84	95							
	Cum	17	17	17	21	23	32	97	187							
	%-N	340	155	65	46	38	38	84	116							
	%-R	84	63	47	37	5	5	37	63							
Sarh	Dec	1	1	21	24	24	52	57	39							
	%-N	4	4	64	75	53	93	84	51							
	%-R	21	0	37	37	11	53	58	26							
	Cum	1	2	23	47	71	123	180	219							
	%-N	4	4	29	42	45	58	64	61							
	%-R	21	0	16	5	11	0	11	11							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

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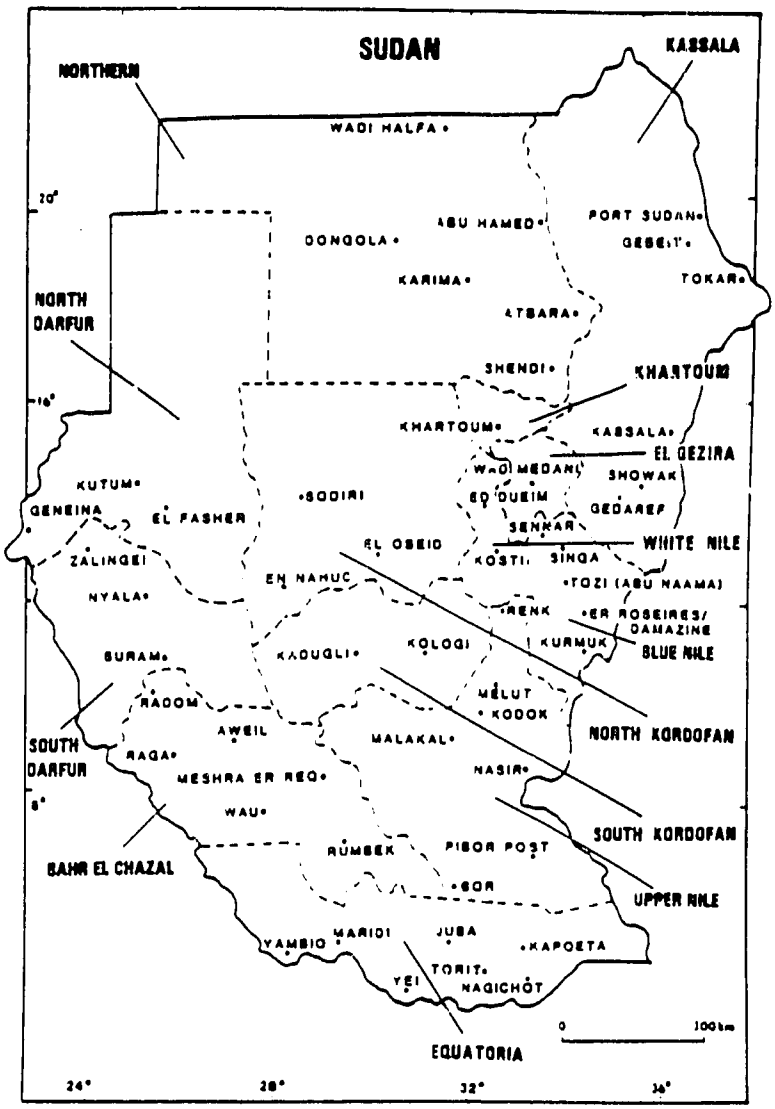
SUDAN ASSESSMENT



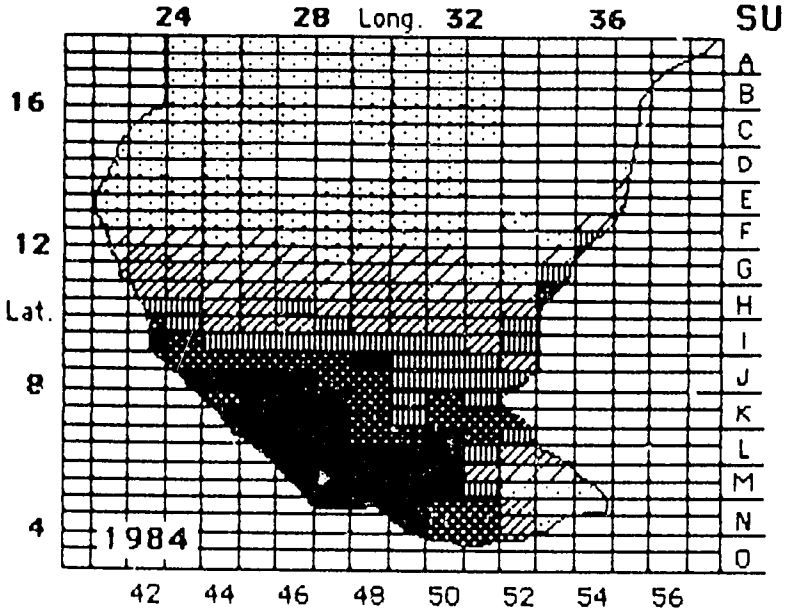
* Early crops in the Southern Region sustained major damage due to dryness in May and early June. Given existing food shortages and transport problems caused by the armed conflict, the food supply situation could become extremely serious. The condition of pastures and late-planted crops improved during July, but quantities of seed available for re-planting may have been limited. The area of greatest potential crop losses includes the central and western Upper Nile region, northern Junglei (including the Malakal area), northern El Buheyrat (north of Rumbek), parts of eastern Bahr El Ghazal (including the Wau area), and the southern part of Southern Kordofan (including Kologi). July vegetation conditions remained poorer than in 1985 in this area, and worse than in 1984 in some places.

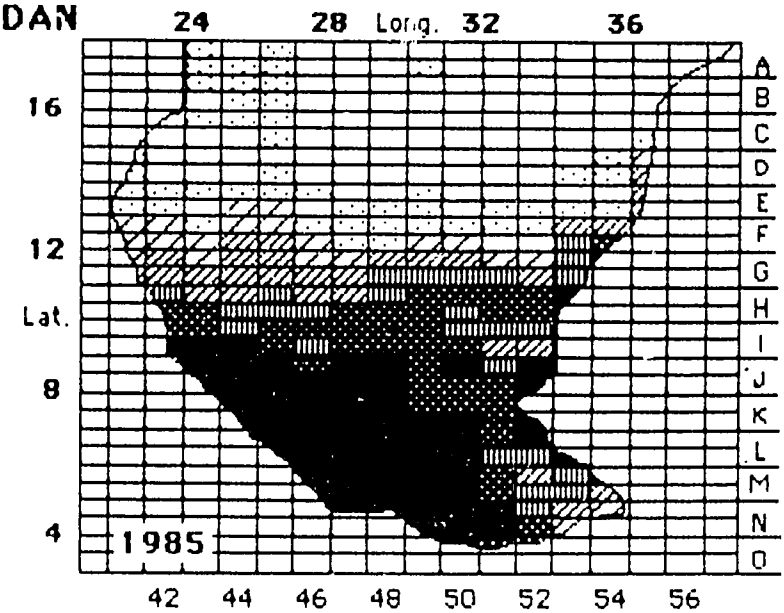
* To the north, potential crop problems exist in eastern Darfur, central and southern Blue Nile, and central Kassala. Satellite vegetation indices lag last year's values in these areas. Abundant rainfall over the next two months will be needed to prevent crop losses. Conditions are mostly favorable in western parts of Southern Darfur, Northern Kordofan, White Nile, and Gezira provinces.

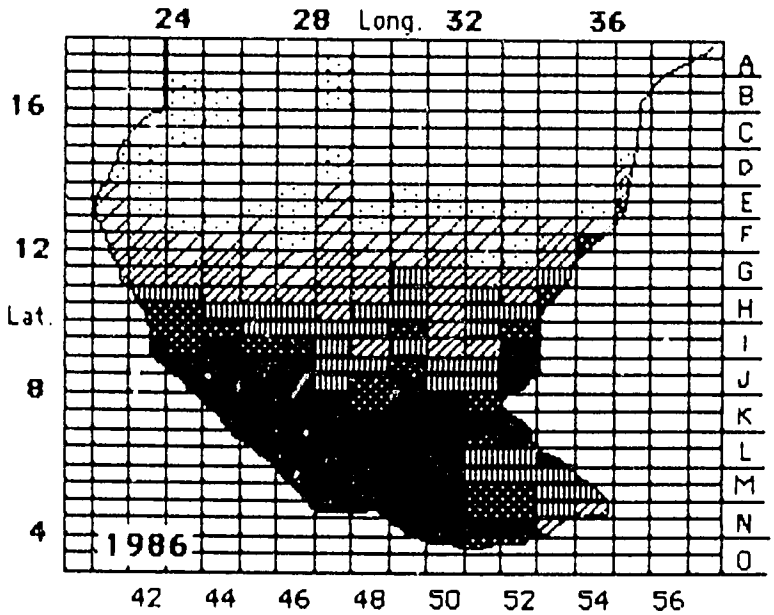
NOAA SATELLITE NORMALIZED VEGETATION INDEX

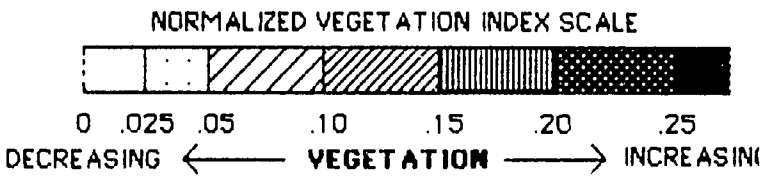
THIRD WEEK OF JULY

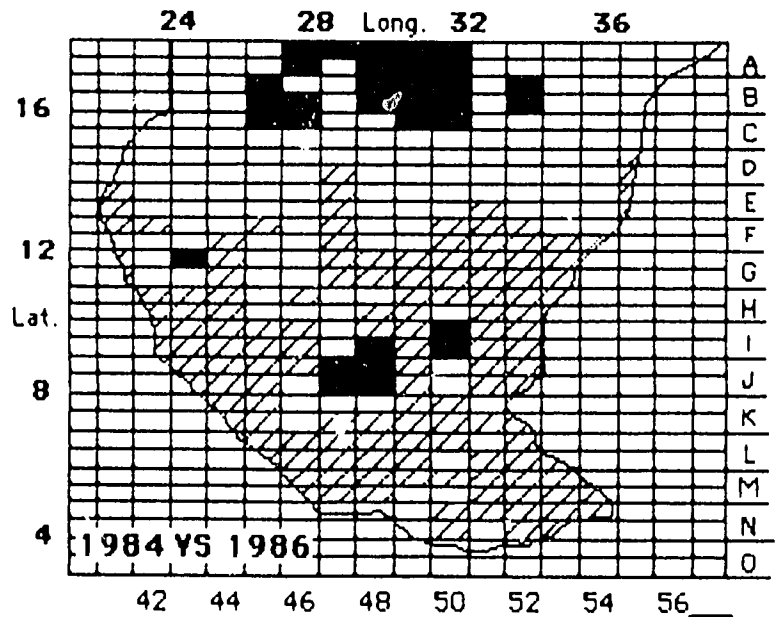
SUDAN

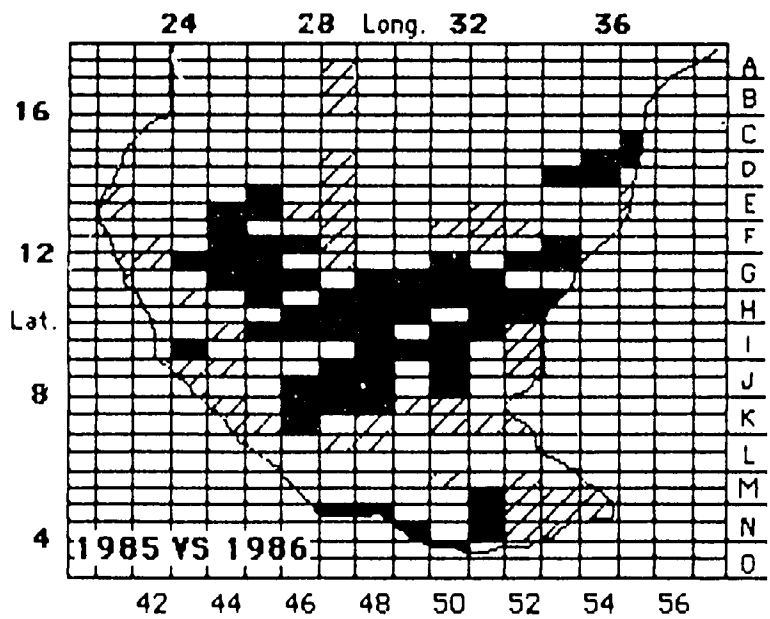










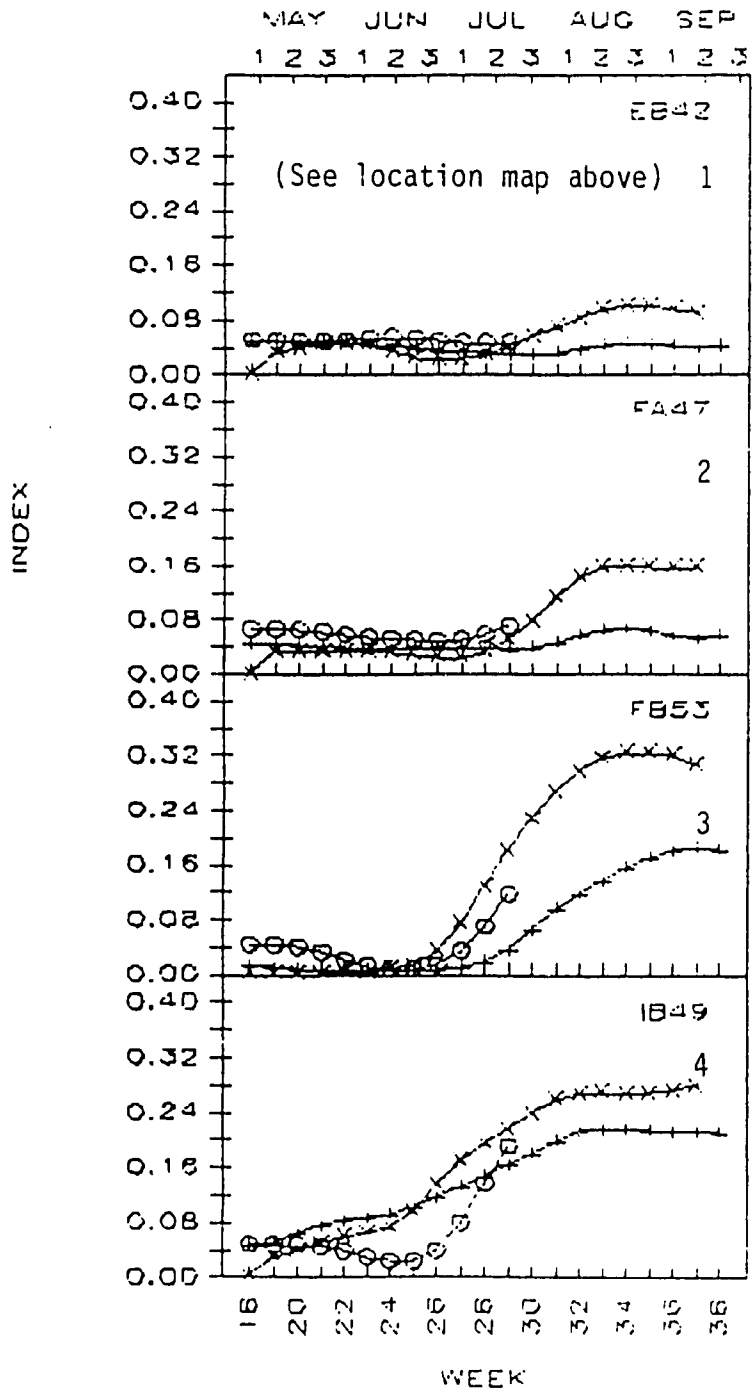


1986 LESS GREEN
NO DIFFERENCE
1986 GREENER

NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

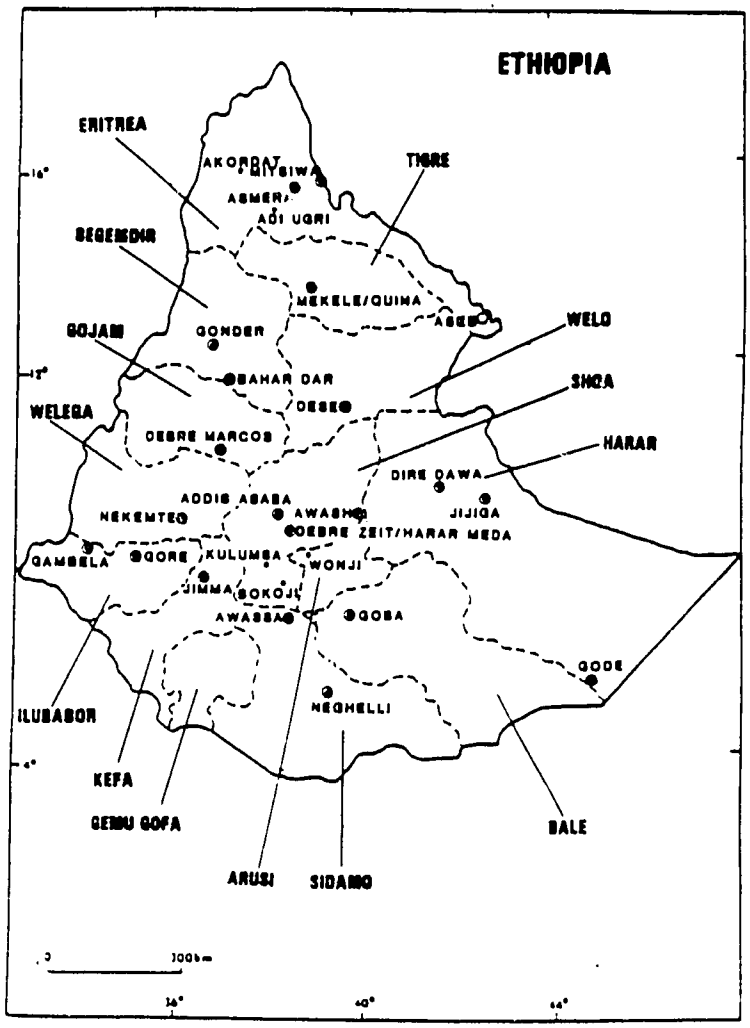
+ = 1984
* = 1985
O = 1986

SUDAN



*NOTE: These grid indicators match NVI grid indicators.

ETHIOPIA ASSESSMENT



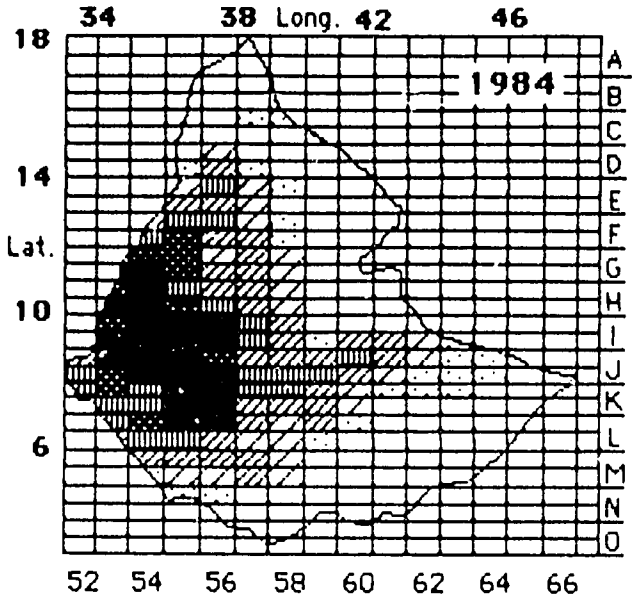
* Early main season crop plantings sustained damage in western areas due to April-May dryness. Though plentiful June-July rainfall benefitted late-planted crops and pastures, the outlook for the autumn-harvested crops is below average in the west.

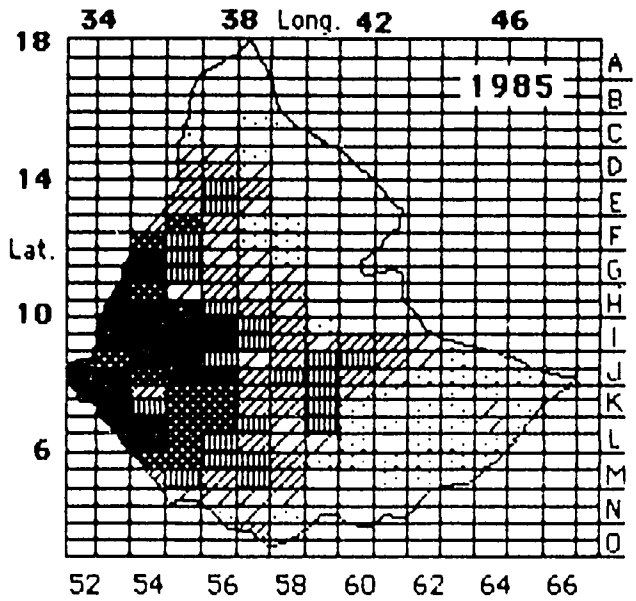
* The outlook remains favorable for crops grown in the north and central parts of the country. Growth of crops appears excellent from southern Eritrea southward through Tigre, Welo, Shoa, and Sidamo. Though good conditions prevail in northern Harar, dry weather in July has reduced potential yields in an area around Jijiga. Additionally, lowland pasture growth appears unfavorable in southern Harar and adjacent parts of Bale. In northern Eritrea, a small area northeast of Akordat has somewhat less vegetation growth than last year.

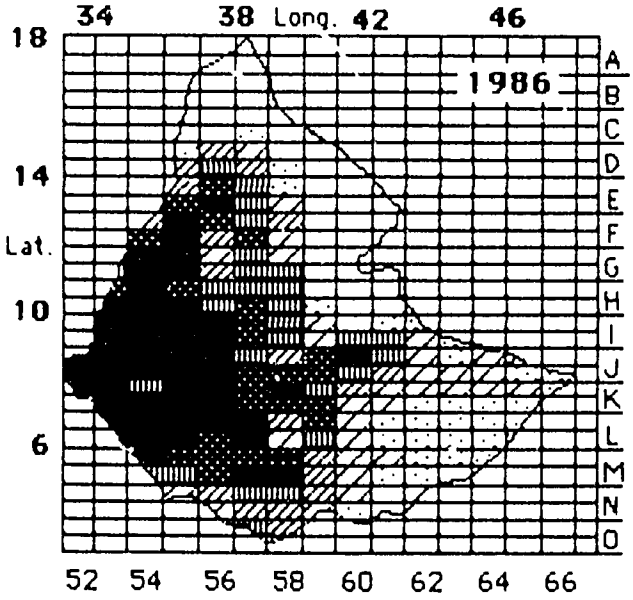
NOAA SATELLITE NORMALIZED VEGETATION INDEX

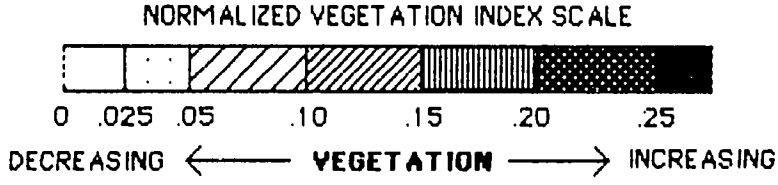
THIRD WEEK OF JULY

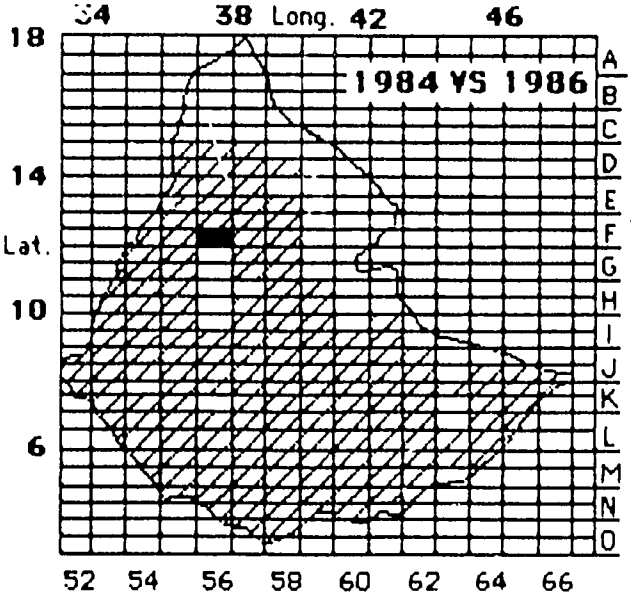
ETHIOPIA

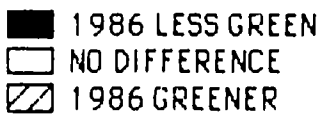


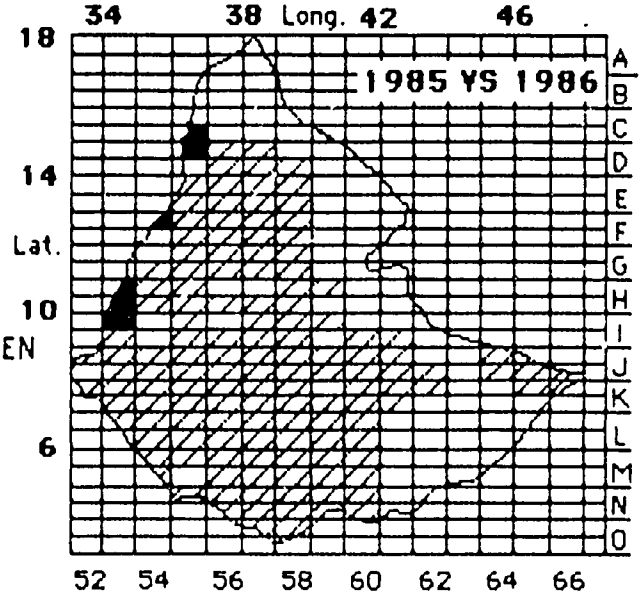






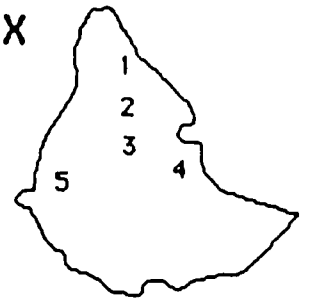


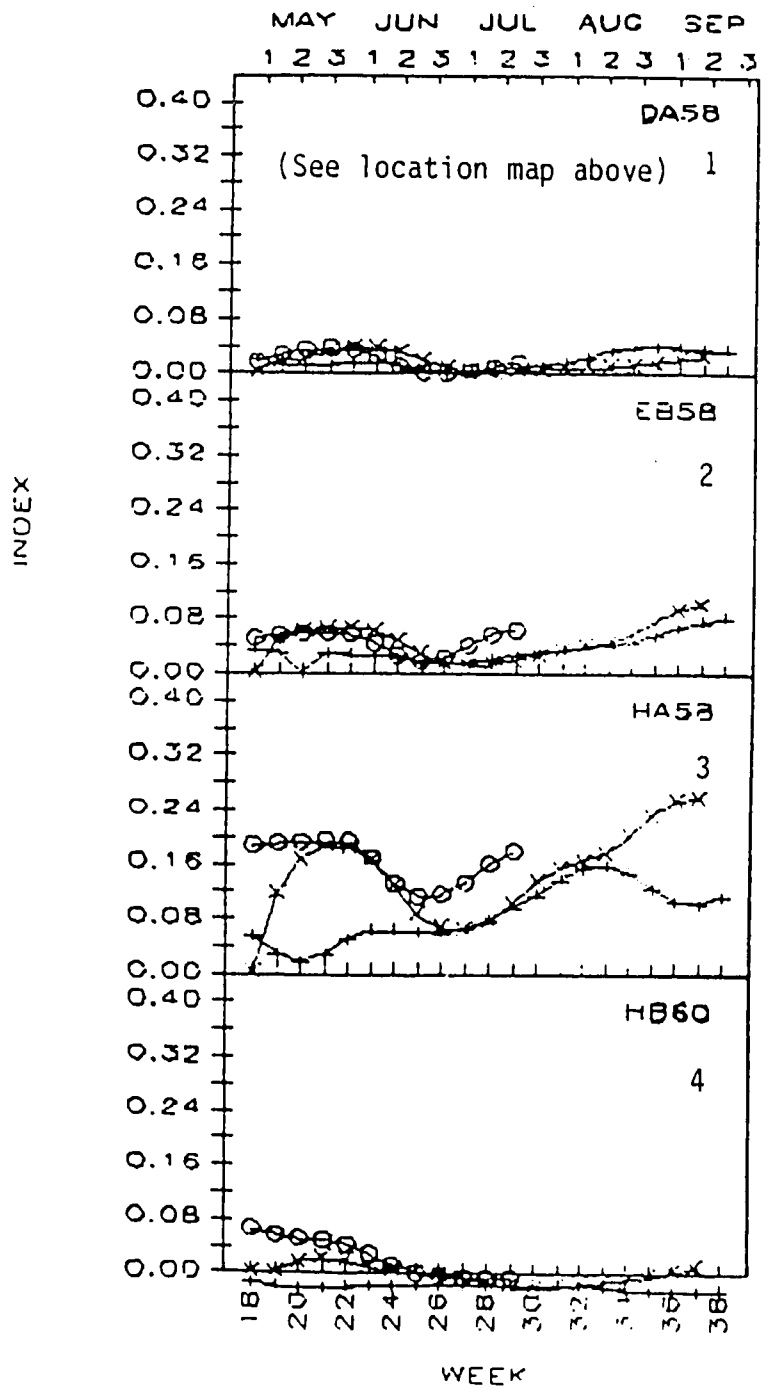


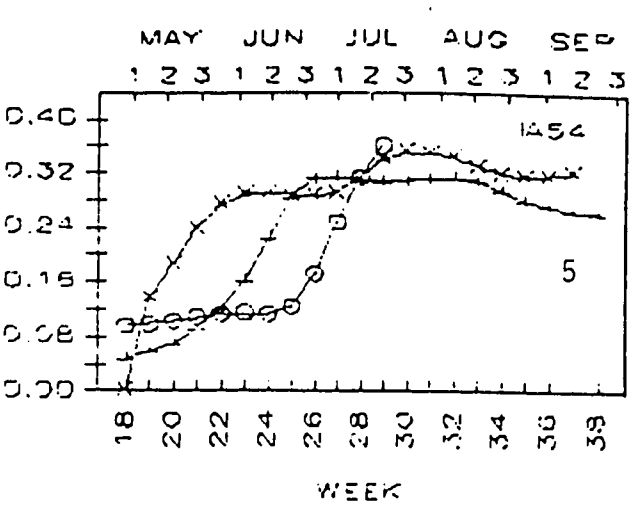


NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS) ETHIOPIA

+ = 1984
* = 1985
O = 1986







*NOTE: These grid indicators match NVI grid indicators.

Decadal and Cumlative Decadal Rainfall Analysis

Area: Horn of Africa Country: Ethiopia Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Addis Ababa	Dec	17	26	0	21	77	84	43	22	49						
	%-N	68	104	0	70	193	158	60	26	49						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	17	43	43	64	141	225	268	290	339						
	%-N	68	86	54	58	94	111	97	81	74						
	%-R	***	***	***	***	***	***	***	***	***						
Asmara	Dec	23	13	0	7	17	69	10	69	88						
	%-N	209	118	0	175	155	265	19	106	114						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	23	36	36	43	60	129	139	208	296						
	%-N	209	164	109	116	125	174	110	109	110						
	%-R	***	***	***	***	***	***	***	***	***						
Awassa	Dec	18	22	36	72	108	25	30	70	26						
	%-N	45	52	82	240	386	83	79	163	52						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	18	40	76	148	256	281	311	381	407						
	%-N	45	49	60	95	139	131	123	129	118						
	%-R	***	***	***	***	***	***	***	***	***						
Combolcha (Dese)	Dec	4	34	26	5	2	102	67	34	65						
	%-N	15	162	163	500	25	364	100	39	59						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	4	38	64	69	71	173	240	274	339						
	%-N	15	81	102	108	99	173	144	107	93						
	%-R	***	***	***	***	***	***	***	***	***						
Debre Marcos	Dec	4	6	12	38	53	101	74	44	111						
	%-N	14	19	30	95	106	155	87	45	98						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	4	10	22	60	113	214	288	332	443						
	%-N	14	17	22	43	59	84	85	76	81						
	%-R	***	***	***	***	***	***	***	***	***						

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

*** = Less than fifteen years of valid historic data or precipitation missing

Decadal and Cumlative Decadal Rainfall Analysis

Area: Horn of Africa Country: Ethiopia Flag: Class I Year: 1986

Station Name	Param	May (5) 1	May (5) 2	May (5) 3	June (6) 1	June (6) 2	June (6) 3	July (7) 1	July (7) 2	July (7) 3	August (8) 1	August (8) 2	August (8) 3	September (9) 1	September (9) 2	September (9) 3
Dire Dawa	Dec	13	46	10	15	3	20	20	18	5						
	%-N	72	307	83	250	43	182	95	62	13						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	13	59	69	84	87	107	127	145	150						
	%-N	72	179	153	165	150	155	141	122	94						
	%-R	***	***	***	***	***	***	***	***	***						
Gonder	Dec	2	3	1	18	49	72	93	71	82						
	%-N	8	10	3	46	94	101	95	63	64						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	2	5	6	24	73	145	238	309	391						
	%-N	8	9	6	18	39	56	67	66	65						
	%-R	***	***	***	***	***	***	***	***	***						
Gore	Dec	31	18	39	48	74	76	137	85	57						
	%-N	50	24	41	48	69	68	127	79	50						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	31	49	88	136	210	286	423	508	565						
	%-N	50	36	38	41	48	52	64	66	64						
	%-R	***	***	***	***	***	***	***	***	***						
Jijiga	Dec	21	88	1	13	5	38	6	15	0						
	%-N	49	215	3	50	23	181	23	48	0						
	%-R	***	***	***	***	***	***	***	***	***						
	Cum	21	109	110	123	128	166	172	187	187						
	%-N	49	130	89	82	74	86	79	75	64						
	%-R	***	***	***	***	***	***	***	***	***						
Mekele (Quiha)	Dec	5	29	0	13	40	96	60	112							
	%-N	45	322	0	1300	444	384	113	162							
	%-R	***	***	***	***	***	***	***	***							
	Cum	5	34	34	47	87	183	243	355							
	%-N	45	170	126	168	235	295	211	193							
	%-R	***	***	***	***	***	***	***	***							

Dec = Decadal rainfall(mm) Cum = Cumulative decadal rainfall(mm) %-N = Percent of normal(1961-80)

%-R = Percentile rank(1961-80) ??? = Normal equal zero or precipitation missing

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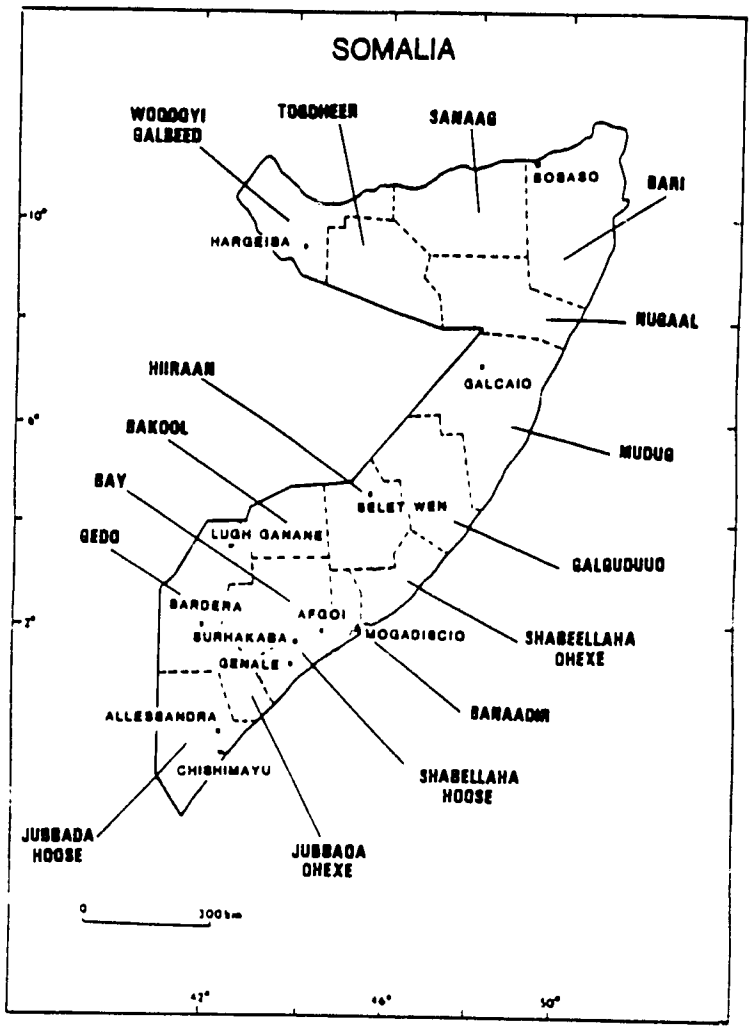
SOMALIA ASSESSMENT



* The main season harvest is in progress. Cereal yields should be high due to ample April-June rainfall.

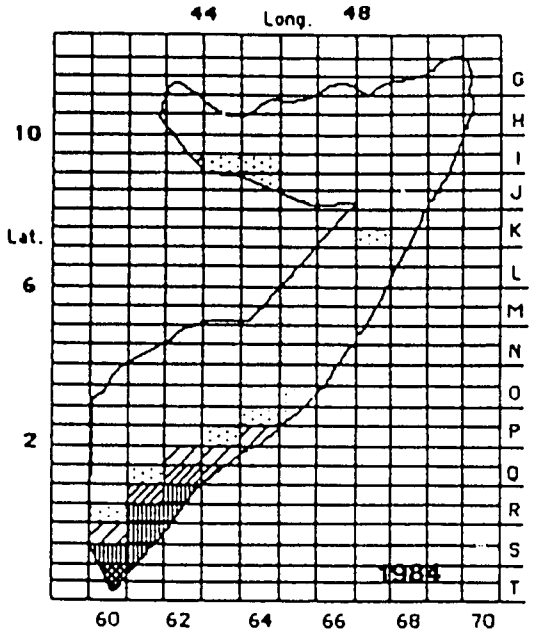
* From satellite imagery, the biomass on the southeast coastline looks very good. There are also green pockets close to the north coast in Senaag and Bari.

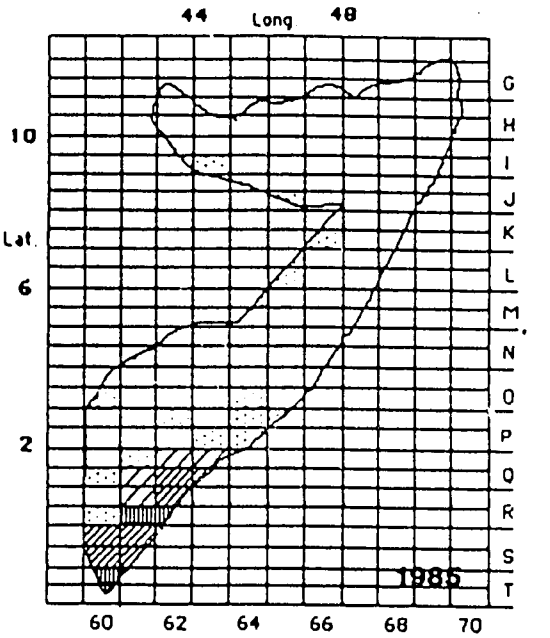
* There was a slight increase in biomass during July across most of Somalia, with the exception of the desert region of the northern coast and small patches in the Mudug, Galguduud, and Hiiraan departments. Somewhat increased biomass was also noted in the rangeland areas of Bari, Sanaag, Nugaal, and Mudug. (The enclosed NVI data have been distorted by clouds and continue to understate biomass in some areas.)

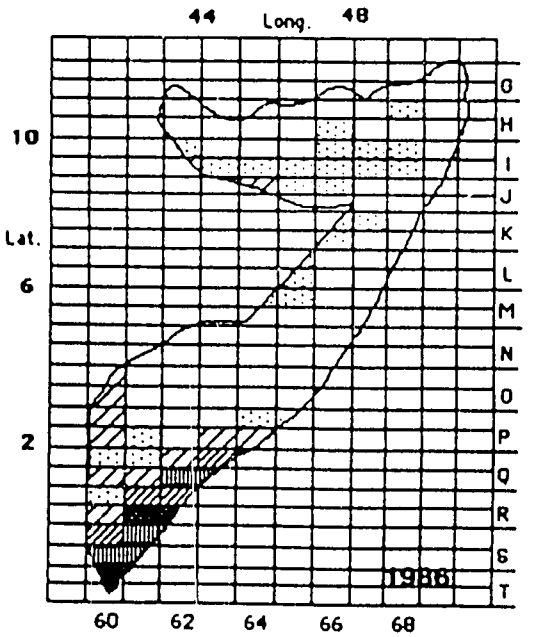
NOAA SATELLITE NORMALIZED VEGETATION INDEX

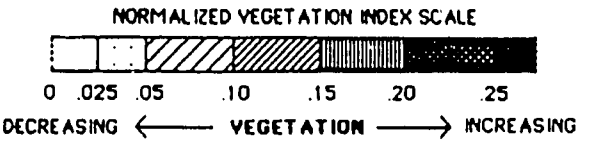
THIRD WEEK OF JULY

SOMALIA





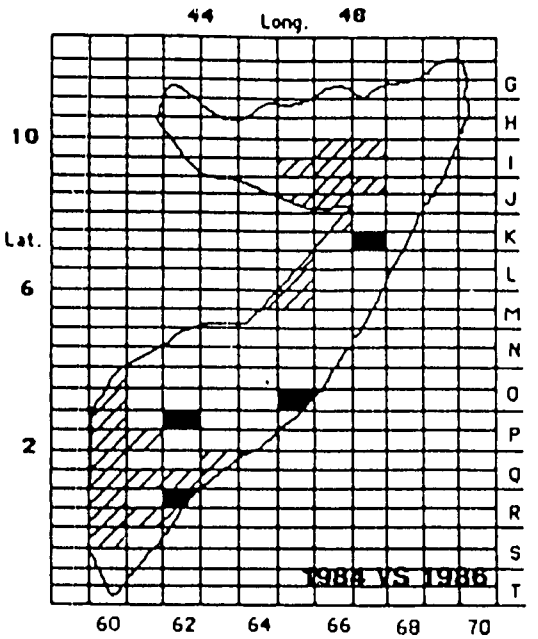


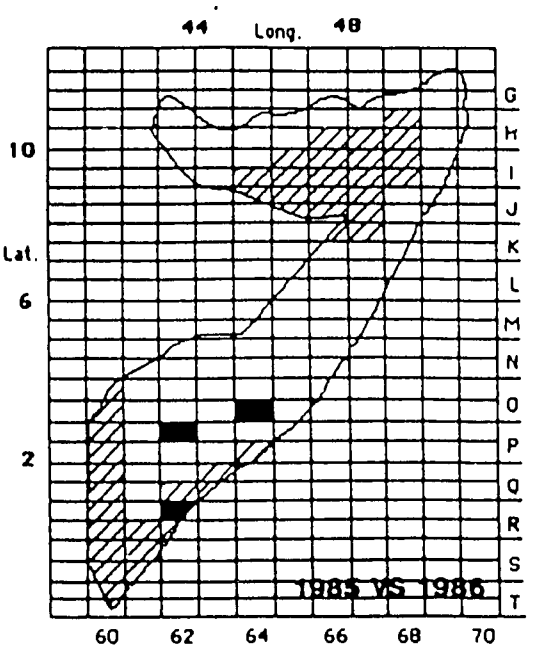


1986 LESS GREEN THAN PREVIOUS YEAR

NO DIFFERENCE FROM PREVIOUS YEAR

1986 GREENER THAN PREVIOUS YEAR

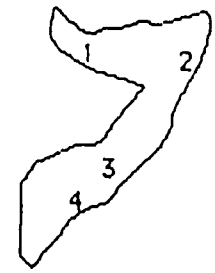


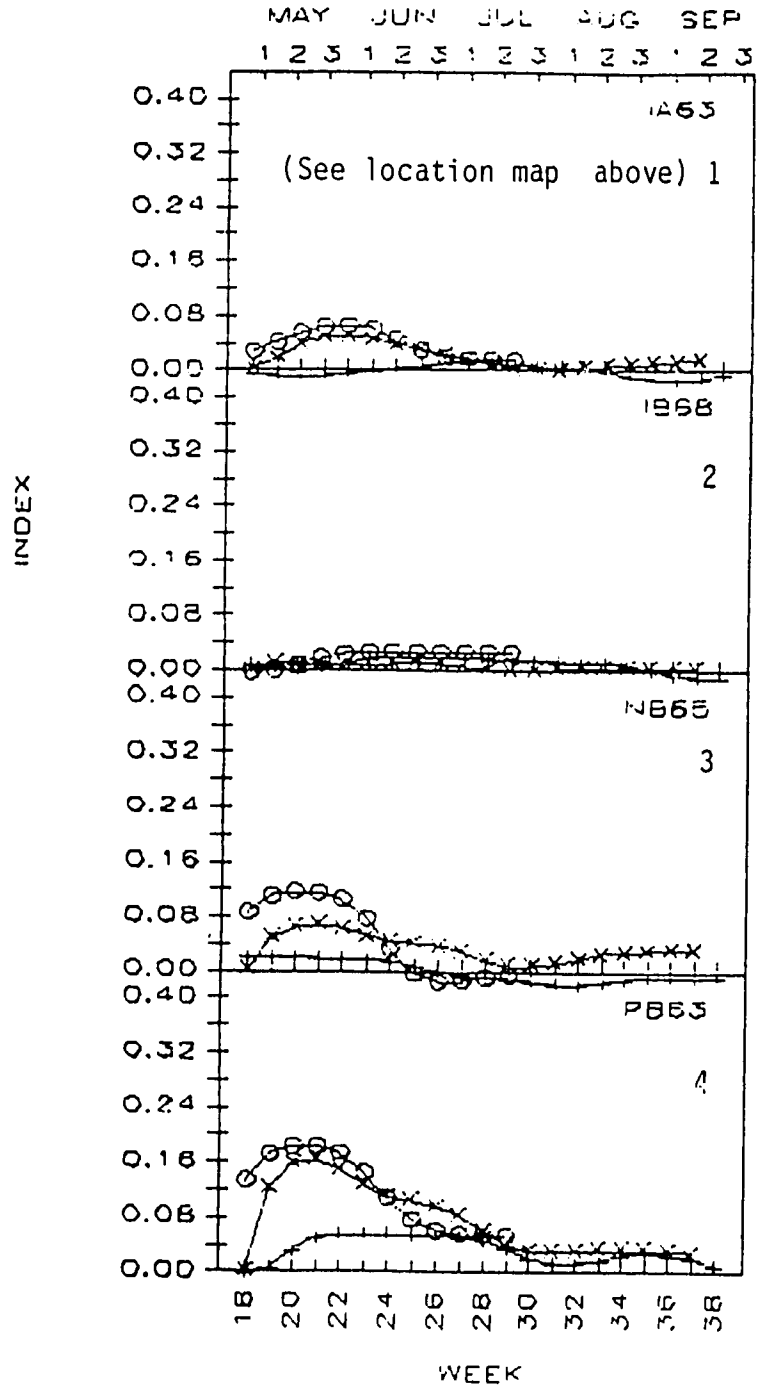


NORMALIZED VEGETATION INDEX TIME SERIES (SELECT GRIDS)

SOMALIA

+ = 1984
* = 1985
O = 1986





*NOTE: These grid indicators match NVI grid indicators