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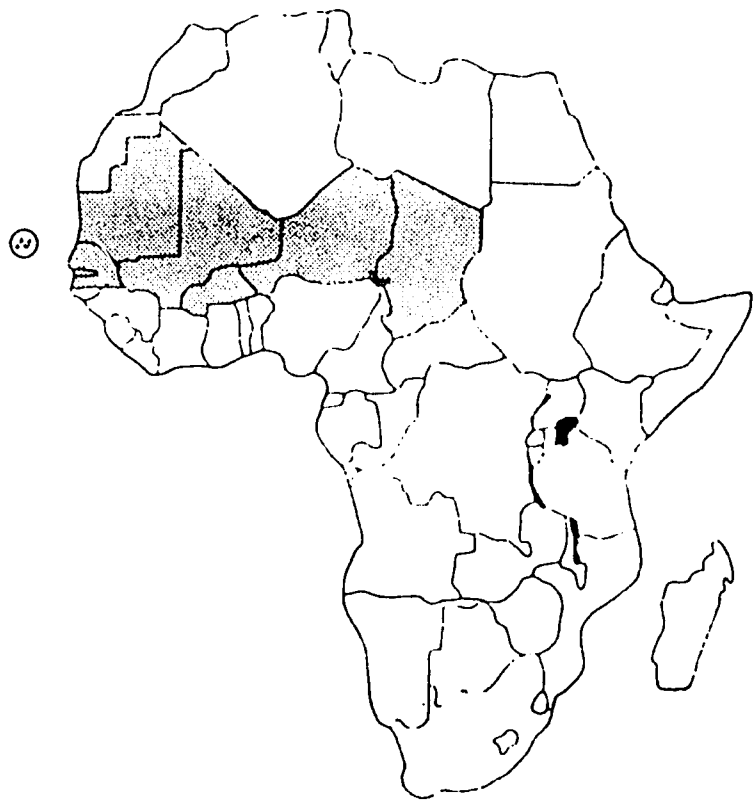
SAHEL COURSE SYLLABUS

SPECIAL CLIMATIC IMPACT ASSESSMENT FOR CROPS AND RANGELANDS:

AGROCLIMATE AND REMOTE SENSING TECHNIQUES USED BY NOAA/NESDIS/AISC



MARCH 11 - APRIL 18, 1986

COLUMBIA, MISSOURI
WASHINGTON, D.C.
U.S.A.

SPONSORING AGENCIES

AGENCY FOR INTERNATIONAL DEVELOPMENT (AID)

NOAA/NATIONAL ENVIRONMENTAL SATELLITE DATA AND INFORMATION SERVICE (NESDIS)
ASSESSMENT AND INFORMATION SERVICES CENTER (AISC)

COOPERATIVE INSTITUTE FOR APPLIED METEOROLOGY (CIAM/UMC)

AGRHYMET REGIONAL CENTER/NIAMEY

Etude Spécial d'Evaluation de l'Impact du Climat pour les Cultures et les Parcours: les Techniques Agroclimatiques et de la Télédéctection

11 mars - 18 avril

SAHEL PROFESSIONAL COURSE

ON

SPECIAL CLIMATIC IMPACT ASSESSMENTS
FOR CROPS AND RANGELANDS:
AGROCLIMATIC AND REMOTE SENSING TECHNIQUES
USED BY NOAA/NESDIS/AISC

COURSE DESCRIPTION

This six week course provides an opportunity for Sahelian professionals to learn more about Special Climatic Impact Assessment procedures used by the NOAA/NESDIS Assessment and Information Services Center. Course participants will be introduced to the agroclimatic and remote sensing techniques used by AISC to assess rainfall impacts on crop/rangeland conditions and to forecast millet/sorghum crop yields in the Sahel. The technical focus of the course is on the integrated use of NOAA AVHRR satellite color-imagery/vegetation indexes, agroclimatic/crop condition indexes and statistical climate/crop yield forecast modeling procedures to prepare special assessments.

The format for the course (in French and English) is based on prepared presentations and practical exercises for applying and evaluating the methods introduced. Participants will have the opportunity to apply various "user friendly" micro-computer software packages to analysis of satellite images, satellite vegetation indexes, agroclimatic indexes, and statistical modeling techniques, based on data for the 1984 and 1985 crop seasons. Each participant (or country team) will be encouraged to prepare a concise report relating the technology potential to their country.

This professional course is being sponsored under an AID funded project, "Use of NOAA/NESDIS Climatic Impact Assessment Technology by Countries of the Sahel and Horn Regions of Africa for Operational Crop Monitoring and Rangelands Management" (BOF-0000-P-CC-3062-02). Under this project, the NOAA/NESDIS Assessment and Information Services Center in cooperation with the University of Missouri-Columbia provided Special Climatic Impact Assessment Reports and in-country technical assistance during the 1985 crop season. Similar assessments will be provided by NOAA/NESDIS during the 1986 season.

OTHER INFORMATION

DATE OF ARRIVAL

The course is scheduled from March 11, 1986 to April 18, 1986. Participants are advised to be in Missouri by Monday, March 10. Some participants may need to arrive earlier because of travel connections. The first meeting is scheduled for Tuesday, March 11.

CLASS SCHEDULE AND LOCATION

The course will be taught in an intensive five week session at the facilities of the NOAA/NESDIS Assessment and Information Services Center, Room 200 Federal Building, 608 E. Cherry (corner 7th and Cherry Sts.), Columbia, Missouri. The sessions will be held in the basement conference room. The course will terminate at the NOAA/NESDIS AISC Climatic Impact Assessment Division, Page Bldg. # 2, 3300 Whitehaven St. N.W., Washington, D.C., after a one week (April 14-18) orientation and seminar period. City maps of both Columbia, Missouri and Washington, D.C. will be issued upon arrival.

Theory sessions will be held mornings, practical exercises afternoons, requiring a total of eight hours of effort, five days a week.

CERTIFICATION

A certificate will be awarded after satisfactory completion of all the requirements in the training program.

CLIMATE

Because the course will take place during the late part of the Winter season, the days and nights will be chilly and snow could be encountered. Clothing for cold weather should be included. In Columbia, Missouri the March and April respective mean maximum temperatures are 11°C and 19°C; the mean minimum temperatures are 0°C and 7°C. In Washington D.C. the normal April temperatures are mean maximum 19°C and mean minimum 8°C.

TRAVEL AND VISAS

Participants will be provided with airline tickets from their host-country to Columbia, Missouri, Washington, D.C. and return. The airline tickets will be available from the host-country airline ticket office a week before the training course begins. A positive form of identification such as a passport is needed to pick up the ticket. Further details will be sent from this office (or from AGRHYMET through the USAID Mission in each country).

Participants are requested to obtain visas for entering the U.S.A. Assistance and other supporting documents for visa application are available from each USAID Mission office.

SUBSISTENCE ALLOWANCE

Each participant will receive funds to cover costs of meals, lodging, and incidentals while in the United States. Approximately one-half of the total amount will be available during the first week of training. Please note that personal preferences, as well as eating habits, will play a major role in the amount required for personal expenses.

HOUSING AND TRANSPORTATION

The official transportation needs for the course will be the responsibility of AISC and CIAM. Transportation needs of the common group can be considered on a case by case basis.

In Columbia, Missouri, a limousine service (B.E.S.T. Limousine) is available at the airport. The cost is $9 from the airport to the University of Missouri campus where participants will be housed. Accommodations will be reserved by the Center at the Mark Twain Residence Hall, 515 S. 5th St., Columbia, Missouri (Tel. 449-7211) at the following rate:

U.S. $125 per week in double rooms. This includes 18 meals per week - breakfast, lunch and dinner Monday thru Friday, brunch and dinner on Saturday and brunch only on Sunday.

For Washington, D.C. the rate will differ. Arrangements are being negotiated.

MEALS

Meals ("take all you can eat") are served at the Mark Twain Residence Hall Cafeteria.

Note: Due to spring recess no meals will be served the week of March 15 to March 23 (last meal to be served is lunch on March 14 and first meal to be served after recess will be breakfast on March 24). However, meals can be obtained at other nearby facilities and restaurants.

Housing rate per week during spring recess will be reduced to U.S. $100.

HEALTH AND ACCIDENT INSURANCE COVERAGE

Each participant will also be provided with free health and accident insurance coverage for the duration of the training program. Coverage begins immediately on the date of departure for the U.S. and will continue until the participant returns directly to his/her country of origin or is released from NOAA/AID responsibility, whichever comes first.

For purposes of processing health and accident insurance coverage, participants should send a cable to the AISC Models Branch, Room 200 Federal Bldg., 608 E. Cherry St., Columbia, Missouri 65201 indicating their Full Name (First, Middle & Last); Date of Birth; Title or Position; Name and Address of their Agency. This information is required at least a month before the beginning of the course.

SELECTION OF PARTICIPANTS

The Regional AGRHYMET Center at Niamey, Niger has been requested to assist with the selection of two professionals (one an agro-meteorologist, the other an agricultural economist/agricultural statistician) from each of the following countries: Burkina Faso, Cape Verde, Chad, Gambia, Mali, Mauritania, Niger and Senegal. List of participants follow.

In general, a professional agrometeorologist and professional agricultural economist/agricultural statistician who are in national service and in working level positions will be designated to participate in the training course. Selected candidates should have at least two years professional experience, preferably at a B.S. degree level, and a working knowledge of agricultural practices in their country.

RESOURCE MATERIALS

Participants are requested to hand-carry the following supplemental data and information:

1. Major crop data: yield, area production (by region) and meteorological data (by stations) for 1984 and 1985.

2. Current land-use maps (cultivated areas for major crops; range and forest areas).

3. Rangeland maps (showing percent wooded area, percent annual vegetation area).

4. Livestock information (number and types of animals, animal units, grazing practices, etc.).

This process is highly encouraged to ensure that adequate data are available for successful training.

LECTURE STAFF

The course will be taught by the staff of the Cooperative Institute for Applied Meteorology (CIAM), Atmospheric Science Department, University of Missouri-Columbia and the NOAA/NESDIS Assessment and Information Services Center-Models Branch, Columbia, Missouri and staff members of the NOAA/NESDIS AISC Climatic Impact Assessment Division in Washington, D.C. The majority of the staff have had extensive international experience with expertise in Agroclimatology, Meteorology, Statistics, Remote Sensing and Computer Science. Guest lectures are also scheduled by the staff of AGRHYMET (Niamey, Niger) and the Statistical Reporting Service (SRS) of the U.S. Department of Agriculture. List of lecturers and staff members follow.

LIST OF PARTICIPANTS

Country	NR No.	Name	Agency
Mauritania	1	GANDEGA Yelli	Ingenieur Agrometeorologiste Chef Service AGRHYMET Direction de Agriculture Nouakchott
	2	DIAKITA Hamala Kaba	Ingenieur Agroeconomiste Division Etude et Developpement Direction de Agriculture Nouakchott
Senegal	3	N'DIAYE Ndene	Ingenieur Agrometeorologiste Chef Division Agrometeologie Direction Meteorologio Nationale Dakar
	4	ABDELLAH Samba	Ingenieur Agronome Coordinateur Direction d l'Agriculture Dakar
Niger	5	ALSO Idrissa	Ingenieur Agrometeorologiste Chef Exploitation Meteo Direction de la Meteorologie Nationale Niamey
	6	MME OUSSEINI Mariama	Ingenieur Agronome/Service Statistique Agricoles Niamey
Chad	7	BETOLOUM Neasmiangodo	Ingenieur Agrometeorologiste Directeur Ressources N'Djamena
	8	NOUGABE Lotard	Ingenieur Statisticien Agricole Chef Division Statistique Direction Agriculture Agricole N'Djamena
Mali	9	TRAORE Kalilou	Ingenieur de la Meteorologie Direction Nationale de la Meteorologie Bamako
	10	CAMARA Bandiougou	Ingenieur de Travaux Agricole Minister l'Agriculture Bamako

Participants (Continued) p/2

Cape Verde	11	ALVES Luis	Ingenieur Agrometeorologiste Directeur Departement, Agro-Meteo-Hydro Insritut National Recherche Agraire Praia
Gambia	12	DARBOE Mounir	Agrometeorologist Dept. of Water Banjul
	13	SANNEH Mohamed	Agricultural Economist Ministry of Agriculture Banjul
Burkina F.	14	FOFANA Sanoussi	Ingenieur Agronome Ministree Agriculture Ouagadougou
	15	DIALLO Adama Alhassane	Ingenieur Meteorologie Chef Service Agromet Direction Meteo Nat Ouagadougou
Haiti	16	Mr. Adolphe	Meteorological Technician Meteorological Service

LECTURERS AND STAFF MEMBERS
Columbia, Missouri

Name	Title	Affiliation
Dr. Rao Achutuni	Agrometeorologist, CIAM	UMC
Mr. Mike Benzinger	Computer/Program Analyst, CIAM	UMC
Ms. Susan Callis	Meteorologist	NESDIS/AISC
Dr. Wayne Decker	Director, CIAM	UMC
Ms. Mildred Grissum	Field Services Assistant	NESDIS/AISC
Mr. Chris Hord	Meteorologist, CIAM	UMC
Dr. Gary Johnson	Remote Sensing Scientist	NESDIS/AISC
Ms. Anne Marie Kaylen	Agricultural Economist, CIAM	UMC
Dr. Sharon LeDuc	Senior Statistician	NESDIS/AISC
Mr. George Lozano	Training Associate, CIAM	UMC
Dr. Thomas Phillips	Computer Specialist	NESDIS/AISC
Dr. Clarence Sakamoto	Chief, AISC Models Branch (Agroclimatologist)	NESDIS/AISC
Dr. Louis Steyaert	Program Manager (Meteorologist)	NESDIS/AISC
Ms. Rita Terry	Writer/Editor, Librarian	NESDIS/AISC
Ms. Virginia Thompson	Physical Scientist	NESDIS/AISC
Ms. Judy Trujillo	Sr. Research Lab. Tech., CIAM	UMC
Mr. Albert van Dijk	Remote Sensing Scientist, CIAM	UMC
Ms. Sandra Weisman	Computer Programmer, CIAM	UMC
Mr. Gerry Wright	Graphic Artist, CIAM	UMC

Washington, D.C.

Dr. Joan Hock	Director, NOAA/AISC (Economist)	NESDIS/AISC
Mr. Russell Ambroziak	Chief, CIAD (Remote Sensing)	NESDIS/AISC
Mr. Douglas LeComte	Chief, Climatic Impact Assessment Branch (Meteorologist)	NESDIS/AISC
Dr. Larason Lambert	Assessor (Agrometeorologist)	NESDIS/AISC
Mr. Jake Robinson	Assessor (Meteorologist)	NESDIS/AISC

VISITING LECTURERS

Dr. J. L. Domergue	Chief, Data Analysis Div.	AGRHYMET/Niamey
Mr. I. Ouedraogo	Meteorologist	AGRHYMET/Niamey
Mr. F. Gnoumou	Agrometeorologist	AGRHYMET/Niamey
Mr. Don Bay	State Statistician	SRS/USDA
Dr. Merritt Padgitt	Agricultural Economist	SRS/USDA
Mr. Arno Behlau	Meteorologist	WMO

AGRHYMET - Agricultural, Hydrology and Meteorology/Niamey Regional Center
AISC - Assessment and Information Services Center
CIAD - Climatic Impact Assessment Division/AISC
CIAM - Cooperative Institute for Applied Meteorology
NESDIS - National Environmental Satellite, Data and Information Services
SRS/USDA - Statistical Reporting Service/U.S. Department of Agriculture
UMC - University of Missouri-Columbia
WMO - World Meteorological Organization

1a

Horaire
Cours Professional

Matin 8:30 - 11:30
Aprés midi 1:30-4:30
Les Heures

Le premier jour - 11 mars Mardi

8:30 A.M. Introduction

Chair: Clarence Sakamoto
Resource Persons:
Wayne Decker
Lou Steyaert
Tom Phillips
George Lozano
AGRHYMET

Les remarques d'overture

Sommaire du cours

Introduction des Participants

Distribution des Materiaux de Cours

Rapport de Stage et Plan d'Evaluation

Renseignements Administratifs

PAUSE

Le Programme de NOAA/AID d'Evaluation de l'Impact

Agroclimatique: Un Sommaire (L. Steyaert)

Tour du Centre des Modèles Désignation des Bureaux

1:30 P.M. Developpement du Manuel des Ressources de Pays

Chair: Judy Trujillo
Resource Persons:
Chris Hord
Sue Callis
Clarence Sakamoto

o Les Données de Base

- Les données disponibles
- Préparation des données pour l'ordinateur

o le Manuel

- Les régions administratives
- La géographie
- Utilisation des sols, distributions des cultures vivrières et parcours
- Calendier agricole
- Type de sol
- Le réseau des stations
- Histograms representatives de la pluviométrie
- Isohyètes de la pluviométrie

Réception

SCHEDULE OF ACTIVITIES

PROFESSIONAL COURSE ON
SPECIAL CLIMATIC IMPACT ASSESSMENTS
FOR CROPS AND RANGELANDS:
AGROCLIMATIC AND REMOTE SENSING TECHNIQUES
USED BY NOAA/NESDIS/AISC

Hours
Morning Session: 8:30 - 11:30
Afternoon Session: 1:30 - 4:30

DAY 1 - MARCH 11, 1986 (TUESDAY)

8:30 A.M. Introduction and Orientation

Chair: Clarence Sakamoto
Resource Persons:
Wayne Decker
Lou Steyaert
Tom Phillips
George Lozano
AGRHYMET

- o Opening Remarks
  - NOAA Assessment and Information Services Center (AISC) representative
  - Director, Cooperative Institute for Applied Meteorology (CIAM)
  - AGRHYMET Regional Center representative
- o Overview of the Course
- o Introduction (Trainees and Staff)
- o Distribution of Course Materials
- o Training Report and Assessment Plan
- o Administrative Announcements

B R E A K

NOAA/AID Agroclimatic Impact Assessment Program: An Overview (L. Steyaert)

Tour of Facilities

Office Space Assignments

1:30 P.M. Development of Resource Manual

Chair: Judy Trujillo
Resource Persons:
Chris Hord
Sue Callis
Clarence Sakamoto

- o Crop and climate data base
  - Discussion of available data for course exercises
  - Preparation of data for computer entry
- o Resource Manual Contents
  - Administrative Regions
  - Geography
  - Land Use, Crop Distribution
  - Crop Calendar
  - Soil Type
  - Station Network
  - Representative Rainfall Histogram
  - Rainfall Isohyets

7 - 8:30 P.M. Reception (Place: Mark Twain Res. Hall, 4th Floor)

8a

Jour 2 - 12 mars Mercredi

8:30 A.M. Climat du Sahel — Chair: I. Ouedraogo, AGRHYMET

PAUSE

Les Principales Cultures Saheliennes — Chair: F. Gnoumou, AGRYMET
- Facteurs affectant la croissance des cultures
- Le calendrier cultural

1:30 P.M. Exercice-Achever les Inputs du Manuel des Ressources — Chair: Judy Trujillo; Resource Persons: Chris Hord, Sue Callis

Jour 3 - 13 mars Jeudi

8:30 A.M. Introduction a la Télédétection — Chair: Gary Johnson; Resource Person: Albert van Dijk
- Définition
- Besoins
- Les Systèmes Représentatifs de la Télédétection

PAUSE

La Base Physique de la Télédétection

Exercice

1:30 P.M. Revue d'exercice — Chair: Gary Johnson; Resource Person: Virginia Thompson

Examen

Discussion

DAY 2 - MARCH 12, 1986 (WEDNESDAY)

8:30 A.M. Climate of the Sahel — Chair: I. Ouedraogo, AGRHYMET

B R E A K

Major Crops in the Sahel — Chair: F. Gnoumou, AGRHYMET

- o Factors Affecting Crop Yield
- o Crop Calendar

1:30 P.M. Exercise: Complete Inputs to Resource Manual — Chair: Judy Trujillo; Resource Persons: Chris Hord, Sue Callis

DAY 3 - MARCH 13, 1986 (THURSDAY)

8:30 A.M. Satellite Overview: Introduction to Remote Sensing — Chair: Gary Johnson; Resource Person: Albert van Dijk

- Definition
- Requirements
- Representative Remote Sensing Systems

B R E A K

- o Physical Basis of Remote Sensing (slide/tape set) Exercise

1:30 P.M. Exercise Review — Chair: Gary Johnson; Resource Person: Virginia Thompson

- o Self Test (from slide/tape set)
- o Discussion

Jour 4 - 14 mars Vendredi

8:30 A.M. Les Caractèristiques des Satellites — Chair: Gary Johnson
Resource Person: Albert van Dijk

Les paramètres orbitales

Les caractèristiques du capteur
- Types des capteurs
- Longuer d'onde

PAUSE

Orientation à l'ordinateur - Introduction à IBM/PC — Chair: Tom Phillips

- Les composants de micro-ordinateur
- Logging on
- Imagerie de Satellite

1:30 P.M. Exercice: Orientation à l'ordinateur - Introduction à IBM/PC (Continued).

16 mars 1986 - 6:30 P.M
Dinner - Dr. Sharon LeDuc Residence

Jour 5 - 17 mars Lundi

8:30 A.M. Les Méthodes d'Estimation des Productions Culturals — Chair: Don Bay
Resource Person: Merritt Padgitt SRS/USDA

- L'enquête de probabilité
- Echantillonage
- Procédé objectif de rendement

1:30 P.M. Orientation à l'ordinateur - VAX 11/730 — Chair: Mike Benzinger
Resource Person: Tom Phillips, Sharon LeDuc, Doug Botner, Virginia Thompson

Composants du Système

DAY 4 - MARCH 14, 1986 (FRIDAY)

8:30 A.M. Satellite Overview: Satellite and Sensor Characteristics

Chair: Gary Johnson
Resource Person: Albert Van Dijk

- o Orbital Parameters
- o Sensor Characteristics
  - Types of Sensors
  - Wavelengths

B R E A K

Orientation with Computers Introduction to IBM/PC

Chair: Tom Phillips
Resource Persons: Sharon LeDuc, Gary Johnson, AGRHYMET

- o Components of Microcomputer
- o Logging On
- o Hands on Familiarity
- o Viewing Satellite Imagery

1:30 P.M. Exercise: Orientation with Computers Introduction to IBM/PC (Continued)

MARCH 16, 1986 (SUNDAY) 6:30 P.M.

DINNER - DR. SHARON LEDUC RESIDENCE

DAY 5 - MARCH 17, 1986 (MONDAY)

8:30 A.M. Methods to Estimate Crop Production: An Overview

Chair: Don Bay
Resource Person: Merritt Padgitt SRS/USDA

- o Probability Survey
- o Sampling Frames
- o Objective Yield Procedure

1:30 P.M. Orientation with Computers - Introduction to VAX 11/730

Chair: Mike Benzinger
Resource Persons: Tom Phillips, Sharon LeDuc, Doug Botner, Virginia Thompson

- o Components of System
- o Logging On
- o Hands-on Familiarity

Jour 6 - 18 mars Mardi

8:30 A.M. Méthodes d'Estimation des Rendements — Chair: Clarence Sakamoto
Resource Persons:
Doug Botner
Albert van Dijk

La transmission des données météorologiques et les modèles de recolte appliqué à temps réel

PAUSE

IBM/PC et VAX 11/730 — Chair: Sharon LeDuc
Resource Persons:
Tom Phillips
Mike Benzinger
AGRHYMET

Tracement des Données

1:30 P.M. IBM/PC et VAX 11/730 (Continuation)

Jour 7 - 19 mars Mercredi

8:30 A.M. Traitement des Données Météorologiques et Culturales — Chair: Rao Achutuni
Resource Person:
Chris Hord
Sue Callis

o Les Données Météorologiques

Regulation de qualité
Homogenité
Les données très variables
Estimation des valeurs manquées

Les échelles temporelles et spatiales

Establissement des procédés opératifs pour

mettre au courant les données météorologiques

o Les Données Culturales
- Les statistiques de superficie, production et rendement
- Contrôle de qualité
- Estimation régional

PAUSE

Preparation des Données de Base: Satellite — Chair: Albert van Dijk
Resource Person:
Gary Johnson

o Les données de satellite
- La couverture Locale (LAC)
- La couverture globale (GAC)
- Stéréographique polaire (PSG)

1:30 P.M. Exercice d'AVHRR — Chair: Gary Johnson
Resource Person:
Virginia Thompson
Albert van Dijk

DAY 6 - MARCH 18, 1986 (TUESDAY)

8:30 A.M. Methods to Estimate Crop Yield: Overview

Chair: Clarence Sakamoto
Resource Persons:
Doug Botner
Albert van Dijk

- o Operational Yield Modeling and Meteorological Data Flow

B R E A K

Further Familiarity with IBM/PC and VAX 11/730

Chair: Sharon LeDuc
Resource Persons:
Tom Phillips
Mike Benzinger
AGRHYMET

- o Plotting and Reviewing of Data

1:30 P.M. Further Familiarity with IBM/PC and VAX 11/730 (Continuation)

DAY 7 - MARCH 19, 1986 (WEDNESDAY)

8:30 A.M. Preparation of Data Base: Meteorological and Crop

Chair: Rao Achutuni
Resource Person:
Chris Hord
Sue Callis

- o Meteorological Data
  - Quality Control
    - Acquiring homogeneous data sets
    - Detecting and evaluating outlyers
    - Estimating missing values
  - Spatial and Temporal Scales
  - Establishing Operational Procedures for Updating Data Base
- o Crop Data
  - Area Producton and Yield Statistics
  - Quality Control
  - Regional Estimation

B R E A K

Preparation of Data Base: Satellite

Chair: Albert van Dijk
Resource Person:
Gary Johnson

- o Satellite Data
  - Local Area Coverage (LAC)
  - Global Area Coverage (GAC)
  - Polar Steographic (PSG)

1:30 P.M. AVHRR Exercise

Chair: Gary Johnson
Resource Person:
Virginia Thompson
Albert van Dijk

- o Familiarity with AVHRR digital data

Jour 8 - 20 mars Jeudi

8:30 A.M.	Les Principles de l'Interprétation des Images	Chair: Gary Johnson Resource Persons: Albert van Dijk Virginia Thompson
	Les Elements d'Interprétation d'Image	
	Exercice d'Interprétation	
	PAUSE	
	Continuation d'Exercice	
1:30 P.M.	Système de Couleur Coordonnée d' Ambroziak (ACCS)	Chair: Gary Johnson Resource Persons: Russ Ambroziak Virginia Thompson Albert van Dijk
	L'ACCS Interprétation des images d'ACCS Montage à IBM-PC	
6:00 P.M.	Dinner: Pot Luck Party - Judy Trujillo Residence	

Jour 9 - 21 mars Vendredi

8:30 A.M.	l'Imagerie avec l'IBM-PC	Chair: Gary Johnson Resource Person: Virginia Thompson
	Achèvement du Manuel des Ressource Pour les Evaluations	Chair: Judy Trujillo
	Termination des Données Culturales et Climatiques à l'ordinateur	Chair: Chris Hord Resource Person: Sue Callis

22 mars Samedi
Voyage à St. Louis

DAY 8 - MARCH 20, 1986 (THURSDAY)

8:30 A.M. Satellite Overview: Principles of Image Interpretation

Chair: Gary Johnson
Resource Persons:
Albert van Dijk
Virginia Thompson

- o Elements of Image Interpretation
- o Interpretation Exercise

B R E A K

- o Continue Interpretation Exercise

1:30 P.M. Satellite Overview: Ambroziak Color Coordinate System (ACCS)

Chair: Gary Johnson
Resource Persons:
Russ Ambroziak
Virginia Thompson
Albert van Dijk

- o The ACCS
- o Interpretation of ACCS Images
- o Display of ACCS on IBM PC

6:00 P.M. Dinner: Pot Luck Party - Judy Trujillo Residence

DAY 9 - MARCH 21, 1986 (FRIDAY)

8:30 A.M./ 1:30 P.M. Hands-On Experience Viewing and Producing Imagery Copy from IBM PC

Chair: Gary Johnson
Resource Person:
Virginia Thompson

Completion of Resource Manual for Assessment

Chair: Judy Trujillo

Completion of Crop and Climate Data Sets in Computers

Chair: Chris Hord
Resource Person:
Sue Callis

MARCH 22, 1986 (SATURDAY)

TOUR OF USDA/ARS WATERSHED
ST. LOUIS, MISSOURI

Jour 10 - 24 mars Lundi

8:30 A.M. Les Concepts de Statistiques — Chair: Sharon LeDuc

- o Utilisation des données météorologiques et climatiques
- o Suppositions des prédicitons climatologiques
- o Les séries climatologiques
- o Règlement des séries climatologiques
- o Distribution empirique
- o Distribution théoretique - gamma, normale

1:30 P.M. Les Concepts Statistiques — Chair: Sharon LeDuc

Exercice: Distibution Empirique

Jour 11 - 25 mars Mardi

8:30 A.M. Les Concepts Statistiques: Corrélation — Chair: Sharon LeDuc

Diagrammes dispersés

Triangle de corrélation

PAUSE

Comment on choisit le modèle de rendement — Chair: Sue Callis

1:30 P.M. Excercice: Corrélation — Chair: Sharon LeDuc

Jour 12 - 26 mars Mercredi

8:30 A.M. Concept Statistique: Analyse de Régression — Chair: Sharon LeDuc; Resource Person: Rao Achutuni

- o Matrice de dessein pour les régressions
  - Variables de 'dummy'
  - Variables lineaires
  - Covariance

PAUSE

- o Exercice

1:30 P.M. Exercise - Analyse de Regression à VAX 11/730 — Chair: Sharon LeDuc; Resource Person: Mike Benzinger

DAY 10 - MARCH 24, 1986 (MONDAY)

8:30 A.M. Statistical Concepts: Overview — Chair: Sharon LeDuc

- o Use of Weather and Climate Data
- o Assumptions for Climatological Predictions
- o Climatological Series
- o Adjustment of Climatological Means
- o Empirical Distributions
- o Theoretical Distribution: Normal, Gamma

1:30 P.M. Statistical Concepts: Overview (Continued)

Exercises: Empirical Distribution (Percentile Rank) — Chair: Sharon LeDuc

DAY 11 - MARCH 25, 1986 (TUESDAY)

8:30 A.M. Statistical Concepts: Correlation — Chair: Sharon LeDuc

- o Scatter Diagram
- o Correlation Triangle

B R E A K

Factors Affecting Crop Yield Model Selection — Chair: Sue Callis

1:30 P.M. Exercise: Correlation — Chair: Sharon LeDuc

DAY 12 - MARCH 26, 1986 (WEDNESDAY)

8:30 A.M. Statistical Concept: Regression Analysis — Chair: Sharon LeDuc; Resource Person: Rao Achutuni

- o Design Matrix for Regression
  - Dummy variables
  - Linear variables
  - Covariance

B R E A K

- o Exercise

1:30 P.M. Exercise: Regression Analysis on VAX 11/730 — Chair: Sharon LeDuc; Resource Person: Mike Benzinger

13a

Jour 13 - 27 mars Jeudi

8:30 A.M. Indice de Biomasse Verte — Chair: Albert van Dijk

Rationale
Calcule de NVI
Series Chronologique de NVI

PAUSE

Lissement des Données
Interprétation des Données

1:30 P.M. Exercice de NVI — Chair: Albert van Dijk

Jour 14 - 28 mars Vendredi

8:30 A.M. Développment de NVI et le Rendement — Chair: Albert van Dijk

Procédés
Exercice

PAUSE

Développement de NVI pour L'Evaluation de Parcours — Chair: Albert van Dijk

Procédés
Développement de NVI
Exercice

1:30 P.M. Exercise: Imagerie du Pays et Séries Chronologiques de NVI — Chair: Albert van Dijk
Resource Persons:
Gary Johnson
Virginia Thompson

DAY 13 - MARCH 27, 1986 (THURSDAY)

8:30 A.M. Satellite Overview: Normalized Vegetation Index — Chair: Albert van Dijk

- o Rationale of Vegetation Index
- o Calculation of NVI
- o NVI Time-Series

B R E A K

- o Smoothing NVI Data
- o Interpretation of NVI Data

1:30 P.M. Satellite Overview: Exercise on NVI — Chair: Albert van Dijk

DAY 14 - MARCH 28, 1985 (FRIDAY)

8:30 A.M. Satellite Overview: Development of NVI and Crop Yield — Chair: Albert van Dijk

- o Procedures
- o Exercise

B R E A K

Satellite Overview: Development of NVI for Rangeland Assessment — Chair: Albert van Dijk

- o Procedures
- o Development of NVI for Rangeland Assessment
- o Exercise

1:30 P.M. Exercise: Country Imagery and NVI Time-Series — Chair: Albert van Dijk
Resource Persons:
Gary Johnson
Virginia Thompson

Jour 15 - 31 mars Lundi

8:30 A.M.	Construction d'un Modèle Statistique de Culture	Chair: Sharon LeDuc Resource Persons: Rao Achutuni Mike Benzinger AGRHYMET
1:30 P.M.	Exercice de VAX 11/730 et IBM/PC	

Jour 16 Premier Avril Mardi

8:30 A.M.	Construction d'un Modèle Statistique (Continuation)	Chair: Sharon LeDuc Resource Persons: Rao Achutuni Mike Benzinger AGRHYMET
1:30 P.M.	Exercice de VAX 11/730 et IBM PC	

Jour 17 - 2 Avril Mercredi

8:30 A.M. Les indices des conditions agroclimatiques

Chair: Rao Achutuni
Resource Person:
AGRHYMET

Rationale
Indice du Bilan Hydrique
Analyse Spatiale
Analyse Temporelle

PAUSE

Le Bon sens et l'Absurdité en Modèlant les cultures

Chair: Clarence Sakamot
Resource Person:
Sharon LeDuc

1:30 P.M. Exercice - calcule, analyse de traceur et interprétation de l'indice du Bilan Hydrique à IBM PC/VAX

Chair: AGRHYMET
Resource Person:
Sharon LeDuc

- o Evaluation de l'indice pour 1985
- o Analyse spatiale
- o Analyse temporelle
- o SUIVI

DAY 15 - MARCH 31, 1986 (MONDAY)

8:30 A.M.	Exercise: Building a Statistical Crop Model	Chair: Sharon LeDuc Resource Persons: Rao Achutuni Mike Benzinger AGRHYMET
1:30 P.M.	Exercise with Use of VAX 11/730; IBM PC	

DAY 16 - APRIL 1, 1986 (TUESDAY)

8:30 A.M.	Building a Statistical Crop Model (Continued)	Chair: Sharon LeDuc Resource Persons: Rao Achutuni Mike Benzinger AGRHYMET
1:30 P.M.	Exercise with Use of VAX 11/730; IBM PC	

DAY 17 - APRIL 2, 1986 (WEDNESDAY)

8:30 A.M. Agroclimate Crop Condition Indices

Chair: Rao Achutuni
Resource Person:
AGRHYMET

- o Rationale for Indices
- o Water Balance Index (FAO)
- o Spatial Analysis
- o Temporal Analysis

BREAK

Sense and Non-sense in Crop Modeling

Chair: Clarence Sakamoto
Resource Person:
Sharon LeDuc

1:30 P.M. Exercise: Calculating, Plotting Analysis and Interpretation of Water Balance on the IBM PC/VAX

Chair: AGRHYMET
Resource Person:
Sharon LeDuc

- o Evaluation of Index for 1985
- o Spatial Analysis
- o Temporal Analysis
- o SUIVI

15a

Jour 18 - 3 Avril Jeudi

8:30 A.M. l'Integration des données et d'information pour faire les évaluation: Le Système de l'Information Géographique (GIS)

Chair: Lou Steyaert
Resource Person:
Clarence Sakamoto
Gary Johnson

GIS à main et automé
Utilisation de GIS pour les évaluations agroclimatiques

PAUSE

Evaluation des conditions culturales

Chair: Rao Achutuni

Objectif
Identification des utilisateurs et leurs besoins
Fréquence
Présentation

1:30 P.M. Exercice: les composants de GIS

Chair: Gary Johnson
Resource Persons:
Rao Achutuni
Albert van Dijk
Virginia Thompson

Jour 19 · 4 Avril Vendredi

8:30 A.M. Utilité des Données Supplimentaires dans les Evaluations

Chair: Rao Achutuni
Resource Person:
Rita Terry

les Données Episodiques
la sécheresse
l'inondation
la maladie
Autres

Utilisation des Données

PAUSE

Discussion des Modèles de Satellite et de Culture/Climat

Chair: Lou Steyaert
Resource Person:
Albert van Dyk
Sharon LeDuc

1:30 P.M. Intégration des Données et l'Information pour les Evaluations: Etude de Soudan 1985

Chair: Rao Achutuni
Resource Person: Staff AGRHYMET

Analyse Pluviométrique
Indice de FAO
Résultats des Modèles Culturals
Imagerie de Satellite
Tracement de NVI
Information de Calendrier Cultural
Analyse des Données Supplementaires

DAY 18 - APRIL 3, 1986 (THURSDAY)

8:30 A.M. Integrating Data and Information for Assessment: Geographic Information System (GIS)

Chair: Lou Steyaert
Resource Persons:
Clarence Sakamoto
Gary Johnson

- o Manual and Automated GIS
- o Use of GIS in Agroclimatic Assessment

B R E A K

Crop Condition Assessment Reports

Chair: Rao Achutuni

- o Purpose
- o Identifying Users and User Needs
- o Frequency
- o Format

1:30 P.M. Exercise: Compiling Components of Manual GIS

Chair: Gary Johnson
Resource Persons:
Rao Achutuni
Albert van Dijk
Virginia Thompson

DAY 19 - APRIL 4, 1986 (FRIDAY)

8:30 A.M. Utility of Ancillary Data in Assessment

Chair: Rao Achutuni
Resource Person:
Rita Terry

- o Episodic Event Data Base
  - Drought
  - Floods
  - Pests and Disease
  - Others
- o How to Use these Data

B R E A K

Discussion of Satellite and Crop/Weather Models for Estimating Crop Yield

Chair: Lou Steyaert
Resource Person:
Albert van Dijk
Sharon LeDuc

1:30 P.M. Integrating Data and Information for Assessment: 1985 Case Study of Sudan

Chair: Rao Achutuni
Resource Persons: Staff AGRHYMET

- o Rainfall Analysis
- o FAO Index
- o Crop Model Results
- o Satellite Imagery
- o NVI Plots
- o Crop Calendar Information
- o Ancillary Data Analysis

Jour 20 - 7 Avril Lundi

8:30 A.M. Intégration des Données et l'Information pour les Evaluations: Evaluation du Soudan — Chair: Rao Achutuni; Resource Person: Staff

Résumé
Conditions de Parcours Végétation/ Biomasse
Condition Cultural
Analyse Météorologique
Tables, Figures, Imagerie de Satellite
Estimations des Rendements

1:30 P.M. Exercice d'Evaluation des Pays — Chair: Gary Johnson; Resource Persons: Staff

Jour 21 à 23 - 8 à 10 Avril

8:30 A.M./1:30 P.M. Exercice d'Evaluation des Pays — Chair: Gary Johnson; Resource Persons: Staff

10 auril 6:00 PM jeudi
Diner - Malachi Restaurant

Jour 24 - 11 Avril Vendredi

8:30 A.M. Critique de Cours — Chair: Clarence Sakamoto

Discussion

8:30 A.M./1:30 P.M. Exercice d'Evaluation — Chair: Gary Johnson; Resource Persons: Staff

Rapport Final (see attached Trainee Report and Assessment Plan)

DAY 20 - APRIL 7, 1986 (MONDAY)

8:30 A.M.	1985 Case Study of Sudan (Continued) Exercise: Assessment Write-Up	Chair: Rao Achutuni Resource Persons: Staff

- o Overview
- o Rangeland Vegetation/Biomass Condition
- o Crop Condition
- o Weather Analysis
- o Supporting Tables, Figures, Satellite Imagery
- o Crop Yield Estimate

1:30 P.M.	Individual Country Assessment Exercise	Chair: Gary Johnson Resource Persons: Staff

DAY 21 to 23 -- APRIL 8 TO 10, 1986
(TUESDAY, WEDNESDAY, THURSDAY)

8:30 A.M./ 1:30 P.M.	Individual Country Assessment Exercise (Continued)	Chair: Gary Johnson Resource Persons: Staff
6:00 P.M.	Dinner and Awards April 10, Thursday Location: Malachi's Restaurant, Stadium Blvd. Social Hour: 6:00 P.M. - Dinner: 7:00 P.M.	

DAY 24 - APRIL 11, 1986 (FRIDAY)

8:30 A.M.	Critique of Course Follow-Up Discussions	Chair: Clarence Sakamoto
8:30 A.M./ 1:30 P.M.	Individual Country Assessment Exercise Final Report (See attached Trainee Report and Assessment Plan)	Chair: Gary Johnson Resource Persons: Staff

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Horaire des Activites à Washington D.C.

Jour 25 - 14 Avril Lundi

A.M.	Introduction	Chair: Russ Ambroziak
	PAUSE	
	Orientation à Processeur des Images	
P.M.	Estimation de la précipitation au Sahel	Chair: Doug LeComte Resource Person: Laras Lambert

Jour 26 - 15 Avril Mardi

A.M.	Les Evaluations Préparation Mettre au courant les Procédés de Communications	Chair: Doug LeComte Resource Person: Jake Robinson
P.M.	Seminaire d'AID par les participants	Chair: Lou Steyaert

Jour 27 - 16 Avril Mercredi

A.M.	Visite à NASA Goddard Space Flight Centre	Chair: Doug LeComte
P.M	Visite à World Weather Building	Chair: Doug LeComte

Jours 28 et 29 Jeudi et Vendredi

Temps Libre

Jour 30 Samedi

Départ

SCHEDULE OF ACTIVITIES IN WASHINGTON, D.C.

APRIL 14 TO 18, 1986 (MONDAY THRU FRIDAY)

PAGE BUILDING #2
3300 WHITEHAVEN AVENUE, N.W.
(ACROSS FROM GEORGETOWN HOLIDAY INN ON WISCONSIN AVENUE)
WASHINGTON, D.C.

DAY 25 (MONDAY)

A.M. Introduction — Chair: Russ Ambroziak

Remarks by Division Chief, Russ Ambroziak

Remarks by Director AISC, Joan C. Hock

B R E A K

Orientation on Image Processor (Russ Ambroziak)

P.M. Estimating Precipitation in the Sahel — Chair: Doug LeComte
Resource Person: Laras Lambert

DAY 26 (TUESDAY)

A.M. Assessment Reports — Chair: Doug LeComte
Resource Person: Jake Robinson

- o Preparation and Mailing
- o Updating Communication Procedures

P.M. AID Seminar by Participants - Wrap Up — Chair: Lou Steyaert

DAY 27 (WEDNESDAY)

A.M. Visit to NASA Goddard Flight Space Center — Chair: Doug LeComte

P.M. Visit to World Weather Building — Chair: Doug LeComte

DAY 28 -29 (THURSDAY AND FRIDAY)

Tour of City - Free Time

DAY 30 (SATURDAY) - DEPART FOR HOME - BON VOYAGE!

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Le Rapport des Stageaires et le Plan d'Evaluation

Gary E. Johnson

mardi, le 8 avril 1986 - 08:30 - 16:30
mercredi, le 9 avril 1986 - 08:30 - 16:30
jeudi, le 10 avril 1986 - 08:30 - 16:30

Ce cours professionel va conclure avec la préparation d'un évaluation agroclimatique de la saison agricole de 1985. Les stageaires de chaque pays se rencontront en équipe et s'appliqueront leurs talents à la préparation d'un évaluation agroclimatique pour 1985.

Il y a trois jours désignés à cette activité, avec un jour en plus pour le rapportage des résultats d'évaluation à l'équipe du Bureau de Modéle et à vos collègues. Il n'y a que un tout petit peu de temps pour cette activité; donc il est très important qu'on commence la préparation de rapport au début de stage.

En plus que les techniques appris, les stageaires auront à leur disponibilité, les manuels de ressources, les données qu'ils ont apporté, les données archivées par le Centre de Service d'Evaluation et de l'Information et les services techniques et sténographiques du Bureau.

On peut organiser le rapport comme suivant:

COUVERTURE (dessiné par le Bureau)

PREFACE (écrit par le Bureau)

REMERCIEMENTS (fournit par les stageaires)

LISTE DES TABLES

LISTE DES ILLUSTRATION

I. Introduction (écrit par le Bureau)

Objectifs du stage

Etendue

II. Les Techniques d'Evaluations (écrit par les stageaires)

A. Agroclimat

1. Pluviométrie

2. Modéles d'indices des conditions culturales

B. Satéllite

1. Satéllite de NOAA

2. Images ACCS

TRAINEE REPORT AND ASSESSMENT PLAN

Gary E. Johnson

This Professional Course will conclude with the preparation of a climatic impact assessment of crop and rangeland conditions for the 1985 cropping season. Participants from each country attending the course will form a team and apply their skills to the preparation of a 1985 agroclimatic assessment of their country.

Three days are scheduled for this activity, with an additional day devoted to the reporting of assessment results to the Models Branch staff and Professional Course colleagues. With a minimal amount of time devoted specifically to this activity, it is imperative that course participants begin to plan for the preparation of this report early in the training.

In addition to the knowledge gained in the course, participants will have available to them Resource Manuals which have been prepared for their use; data which they have brought with them; data archived by the Assessment and Information Services Center; and some technical and secretarial services of the Models Branch.

A suggested outline for the concluding training report follows:

COVER (designed by Models Branch, in French and English)

PREFACE (to be written by Models Branch)

ACKNOWLEDGEMENTS (provided by trainees)

LIST OF TABLES

LIST OF ILLUSTRATIONS

I. Introduction (to be written by Models Branch)

Purpose of Training Course
Scope
Objectives

II. Assessment Techniques (written by trainees based upon lecture material)

A. Agroclimate

1. Precipitation Data
2. Crop Conditions Index Models

B. Satellite

1. The NOAA Satellite
2. ACCS Images
3. Normalized Vegetation Index
   a. Time-Series
   b. Spatial Analysis
   c. NVI Biomass/Rangeland Models

3. Indice de Biomasse Verte

a. Temps Chronologique

b. Analyse Spatiale

c. NVI Modèle de Biomasse/Parcours

C. Système d'Information Géographique Pour Déscriptions des Conditions et l'Analyse des Cultures/Parcours

1. Analyse de Biomasse/Précipitation

2. Combinaison des Eléments d'Evaluations Agroclimatiques

D. Techniques de Prédicton les Rendements

1. Analyse des Statistiques Agricoles

2. Analyse du Modèle Statistique de Pluviométrie/Rendements

3. Analyse du Modèle Statistique de NVI/Rendement

4. Evaluation des Rendements

III. Evaluation par Pays (écrit par les stageaires; avec la soutenance des cartes, graphes et images fabriqués pendant le stage)

A. Introduction

B. Résumé d'évaluation pour 1985

C. Végétation de Parcours - 1985

D. Conditions Culturales - 1985

E. Analyse de Climat - 1985

IV. Appendices

A. Statistiques des Cultures

B. Statistiques Météorologiques

C. Autres par Références

REFERENCES

C. Geographic Information System (GIS) Approach for Crop/Rangeland Condition and Analysis

1. Precipitation/Biomass Analysis
2. Combining Agroclimatic Assessment Elements

D. Crop Yield Forecast Techniques

1. Agricultural Statistics Analysis
2. Statistical Rainfall/Yield Model Analysis
3. Statistical NVI/Yield Model Analysis
4. Assessing Crop Yield

III. Country Assessment (analysis written by trainees; supported by maps, graphs, and images produced during the training course)

A. Introduction
B. 1985 Assessment Overview
C. 1985 Rangeland Vegetation
D. 1985 Crop Conditions
E. 1985 Weather Analysis

IV. Appendices

A. Crop Statistics
B. Meteorological Statistics
C. Others by Reference

REFERENCES