Proposed Plan for a Famine Early Warning System Network (FEWS NET) Program in Haiti

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Objective

On July 17, 2002, the U.S. Agency for International Development (USAID) Office of Foreign Disaster Assistance (OFDA) requested USAID FEWS NET, a program that works in 17 countries in Africa and in Afghanistan, to travel to Haiti the week of July 28. The objective of the trip was to assess how FEWS NET could support existing food security information systems in Haiti. OFDA wanted the trip to coincide with a drought assessment during that same period.

Field trip to drought areas of northwest Haiti

From July 30 to August 1, I traveled with USAID/Haiti and USAID/OFDA staff to the *Département du Nord-Ouest.* The last three bi-annual agricultural seasons have failed in this area, prompting the USAID Office of Food for Peace (FFP) to begin emergency food distributions in schools and health clinics.

Although the area mainly falls into two humid ecological zones—moist deciduous forest and rainforest (see map of ecological zones)—certain environmental and human factors have produced an actual vegetation cover of sparse shrubland and dry deciduous forest. First, rocky soils low in organic matter dominate the upland areas. Draped over a hilly topography, the soils are extremely vulnerable to physical soil erosion. Moreover, much of the area lies in the lee of two mountain chains, the *Massif de Terre Neuve* and *Massif du Nord,* that block rain from the northeast.

Human factors have exacerbated the environmental vulnerability of the area, for decades of deforestation have removed almost all of the area's original vegetation (see map of forest cover). Today, clear-cutting of secondary forest to produce charcoal for Port-au-Prince continues to intensify land degradation across wide areas. Land degradation is a major cause of the chronic food insecurity in the Northwest. Therefore, sustainable natural resource management and food security in the Northwest depends upon the development of sustainable harvesting rotations and the natural regeneration of local tree and shrub species.

Corn is the staple grain crop. Other important crops include white beans, black beans, cassava, yams, and tobacco. In the humid ravines that cut through the upland areas, plantains, bananas, citrus, mangoes, coconuts, and breadfruit flourish. People commonly raise goats, but not sheep or cattle.

The non-profit organization CARE has implemented development programs in Haiti since 1959. Currently, USAID/FFP funds a development assistance program in which CARE implements agriculture, health, and education activities in the Northwest that seek to sustainably increase food security. As part of these programs, CARE established, in 1997, the Northwest Early Warning System (NEWS). CARE still operates NEWS today, with data collection assistance from *Action dans le Nord-Ouest pour la Sécurité Alimentaire* (ANOSA), a food security project of the German non-profit organization *Deutsche Welthungerhilfe.*

The objective of NEWS is to rapidly identify food insecurity problems and bring them to the attention of decision-makers. Since 1997, NEWS has collected original rainfall data from 38 rain gauges and original price data from 10 markets. In addition, the NEWS coordinator travels extensively in the field and gathers qualitative information on the state of agricultural crops, livestock, and people's coping strategies. NEWS issues a printed bulletin each month with analyses of this information and summary maps of vulnerability. NEWS is the only operational famine early warning system in Haiti.

We traveled extensively through the Northwest with Jerry Delphin, the NEWS coordinator. He demonstrated a thorough knowledge of agriculture, meteorology, and early warning. For ideas to strengthen NEWS, Jerry accesses the Internet in the small commune of Bassin Bleu and downloads material from the FEWS NET web sites.

Currently, NEWS does not have access to satellite data, one of the fundamental information sources for FEWS NET. The principal remote sensing tool for FEWS NET is the Normalized Difference Vegetation Index (NDVI), derived from the Advanced Very High Resolution Radiometer (AVHRR) sensor on board a series of National Oceanic and Atmospheric Administration (NOAA) satellites. NDVI maps show the relative rate of production of green biomass. Comparing the greenness of the land to the greenness of past years can reveal areas of low vegetative productivity. For Africa, the National Aeronautics and Space Administration (NASA), NOAA, and the U.S. Geological Survey (USGS) have acquired, analyzed, and archived all AVHRR NDVI data at a spatial resolution of 8 km from July 1981 to now. For areas outside Africa, the U.S. Department of Agriculture purchases data from the French satellite SPOT so that NASA can calculate NDVI at a spatial resolution of 1 km. The SPOT data series, however, only started in January 1998.

Before traveling to Haiti, I produced maps of the July 11-20, 2002 SPOT NDVI and the difference from the July 11-20, 1999-2001 average SPOT NDVI (see corresponding maps for the August 1-10 period). In addition, I produced a map of forest cover from a USGS map produced for the Food and Agricultural Organization from 1992-93 AVHRR NDVI (see map of forest cover). I had also downloaded a series of medium-resolution images from Landsat 7, a satellite system managed by NASA and USGS, taken monthly over Hispaniola since July 1999. I placed all of these maps and

images on CD and printed out the NDVI, forest cover, and July 1999-2002 Landsat images on paper. Jerry and his colleagues were very pleased to finally see satellite imagery useful for early warning. They confirmed that the dry anomalies in the images were actually dry areas in the field. Our qualitative observations in the field also confirmed that the images generally matched with actual conditions.

We traveled with CARE staff to food aid distributions at the health clinic in Môle St. Nicolas and schools in Mare Rouge and Côtes-de-Fer. We also visited a USAID-funded road to the town of Creve, just 5 km from the northwestern tip of Haiti and CARE tree nurseries in Barbe Pagnol and Passe Catabois. We traveled through agricultural areas around Anse Rouge, Baie de Henne, Bombardopolis, Jean-Rabel, and Bassin Bleu. OFDA regional advisor Guy Lawson conducted a detailed assessment of the drought. In summary, the food security situation in parts on the Northwest are serious, but plantains and other non-staple foods have helped people to stave off severe malnutrition. A failure of the next agricultural season, Sept.-Dec. 2002, may cause extreme food insecurity.

In addition to the field trip in the Northwest, we traveled with World Vision staff to a health clinic in Kasse, 3 km from Thomonde in the *Département du Centre* and 7 km from the Dominican Republic. The area did not show signs of drought or serious food insecurity.

Meetings with food security and environmental monitoring agencies

In Port-au-Prince, USAID staff and I met with government agencies involved in food security and environmental monitoring. FEWS NET is a program that seeks to strengthen the capacities of national and regional organizations, so these agencies of the Government of Haiti will be the primary partners if USAID funds FEWS NET to work in Haiti.

The *Coordination National de la Sécurité Alimentaire* (CNSA) is the unit that the Government of Haiti established in 1996 to monitor food security. Assistance from the European Union (EU) RESAL program since 1996 and from a 1997-1999 USAID food security information contract to Chemonics, Inc. helped CNSA establish basic data analytical functions. EU RESAL continues to provide core funding for CNSA operations and for two CNSA contractors. Yet, no national famine early warning system currently exists in Haiti.

Currently, the CNSA consists of the coordinator, a health specialist and an economist funded by the EU, and a GIS specialist funded by the World Food Program (WFP) Vulnerability Analysis and Mapping (VAM) program. The coordinator is an experienced professional who expressed great interest in FEWS NET technical assistance. The three externally-funded technicians are Haitians, but the funding is only assured through the end of 2002. WFP would like to hire a VAM representative for Haiti starting in 2003. CNSA is in a clean, secure office with adequate computers. Chemonics compiled rainfall and agricultural data for them, although most of the files on their data CD

were corrupted and unreadable.

The *Section Météorologie* (weather service) of the *Service National des Ressources en Eau* is located at Port-au-Prince International Airport. It possesses solid capabilities for real-time synoptic observations and forecasts. Météo-France has provided training and equipment. They have not worked with the international desk of the NOAA Hydrometeorological Prediction Center (HPC), however, despite the extensive training and collaboration of the NOAA HPC with Central American and Caribbean meteorologists. The Haiti weather service does receive text bulletins from the NOAA Tropical Prediction Center, Miami, FL, on Caribbean storms and hurricanes.

Only one meteorological station currently operates in the country—the station at the airport. Météo-France is donating 8 automatic and 87 manual stations to Haiti. Although the Haiti weather service does not keep archives of climate data, the *Service de Statistiques Agricoles* (Agricultural Statistics Service) of the *Ministère de l'Agriculture, des Ressources Naturelles, et du Développement Rural* (Ministry of Agriculture, Natural Resources, and Rural Development) has archived rainfall data for some locations. Chemonics compiled much of this data for CNSA. Reportedly, rainfall data exists for numerous stations for the period 1920-1980.

The *Section Hydrologique* (hydrology agency) of the *Service National des Ressources en Eau* is nearly non-functional. The chief of the section reports that 17 stream gauge stations exist, but that they do not have data from them since about 1990. They may have 1920-1980 data for 35 stations across the country.

The *Direction des Sols, Parcs, et Forêts* (Department of Soils, Parks, and Forests) is nearly non-functional. The director expressed little interest in the remote sensing and forest cover maps that I gave to him. The Service does not have forest agents for most of the country, except for the last significant patch of closed-canopy humid evergreen forest—the approximately 20 km^2 *Forêt des Pins*—on the southeast border with the Dominican Republic.

The *Ministère de l'Agriculture, des Ressources Naturelles, et du Développement Rural* also fields very few agents outside the capital. They have no reliable estimates of agricultural production. The *Service de Statistiques Agricoles* has archived rainfall data for some locations.

The *Unité de Télédétection et de Système d'Information Géographique* (UTSIG) (Remote Sensing and Geographic Information Unit) of the *Ministère du Plan et de la Coopération Externe* (Ministry of Planning and External Cooperation) was established by and runs with funding from the European Union.

The U.S. Defense Mapping Agency (DMA) produced, in 1994, a series of 1:50 000 scale topographic maps covering

all of Haiti and 1:12 500 scale maps for urban areas. UTSIG scanned these maps and uses the data in combination with its own original acquisitions.

UTSIG purchased a complete 1998 mosaic of SPOT 20 m resolution images for the entire country. In addition, the UTSIG acquired complete aerial photo coverage of the country at 1:20 000 scale.

With the DMA and SPOT data, UTSIG produced a series of 1:50 000 scale orthoimagemaps for the entire country. Interpretation of the aerial photos permitted UTSIG to produce a land-use map for the entire country. UTSIG plans to sell the maps when the Haiti Customs Service releases the shipping container from the port. UTSIG also plans to produce land-use plans for each department.

UTSIG employs 12 Haitian technicians. ArcView and ERDAS are available in their facility. They expressed interest in data exchange and technical collaboration with FEWS NET, especially USGS. They had even considered the possibility of working on food security applications when the second phase of the EU project starts in 2004.

On Friday, August 2, I gave a presentation at the USAID office "FEWS NET and remote sensing for early warning in Haiti." The audience of approximately 30 people included staff from CARE, Catholic Relief Services, CNSA, USAID, and World Vision. The audience expressed great interest in finally viewing satellite imagery useful for famine early warning in Haiti.

Throughout the visit, Carell Laurent, the USAID program officer who manages the Food for Peace programs, and I discussed in detail how FEWS NET could strengthen existing systems in Haiti. We developed ideas on how to implement a FEWS NET program in Haiti by mid-September.

The trip ended with a meeting with the director of USAID/Haiti and discussion of the ideas for starting up a FEWS!NET program in Haiti.

Preliminary plan for starting FEWS NET Haiti by mid-September 2002

Objectives:

1. To assist the Haiti *Coordination National de la Sécurité Alimentaire* (CNSA) to establish a national food security early warning system.
2. To provide decision makers with constantly updated information on food security in Haiti.

Principal tasks:

1. Work with non-governmental organizations (NGOs) to start primary data collection in the areas where each NGO works
2. Compile and analyze available agricultural, weather, health, and remote sensing data to produce a CNSA monthly report on food security for the entire country, for electronic and paper distribution
3. Establish a CNSA food security web site, hosted by USGS at http://www.fews.net/haiti, containing monthly reports, graphics of satellite images, and other data and information for download
4. Work with CNSA to place agricultural, weather, and health data time series in a standard format (*e.g.* comma separated values) to facilitate Internet distribution
5. Train Haitian partners in geographic information systems (GIS), food security analysis, and vulnerability assessment

Personnel:

1. A Haitian FEWS NET country representative located at the CNSA office in Port-au-Prince
2. Technical support in environmental monitoring, remote sensing, and meteorology and web site hosting from NASA, NOAA, and USGS in the U.S.
3. Technical support in health, nutrition, vulnerability assessment, and food security reporting from Washington staff of the organization providing the FEWS NET Haiti country representative

Funding:

1. For personnel item 1, USAID/Haiti
2. For personnel items 2 and 3, USAID/OFDA for FY2003 and possibly USAID/FFP for subsequent years

Haitian partners:

1. *Coordination National de la Sécurité Alimentaire* (CNSA)
2. *Direction des Sols, Parcs, et Forêts*
3. focal point for the U.N Convention to Combat Desertification, *Ministère de l'Environnement*
4. *Section Hydrologie, Service National des Ressources en Eau*
5. *Section Météorologie, Service National des Ressources en Eau*
6. *Service de Statistiques Agricoles, Ministère de l'Agriculture, des Ressources Naturelles, et du Développement Rural*
7. *Unité de Télédétection et de Système d'Information Géographique (UTSIG), Ministère du Plan et de la Coopération Externe*

NGO and other partners:

1. *Action dans le Nord-Ouest pour la Sécurité Alimentaire*
2. CARE
3. Catholic Relief Services
4. European Union RESAL program
5. Food and Agricultural Organization
6. Save the Children
7. World Food Program
8. World Vision

Remote sensing imagery:

1. NDVI at 1 km resolution and difference from the 1998-2001 average NDVI for Hispaniola and for Haiti, every ten days, produced by NASA and USGS
2. Satellite rainfall estimate at 8 km resolution and difference from a longer-term average, every day, for all of Central America and the Caribbean, produced by NOAA
3. Possibly, Inter-Tropical Convergence Zone (ITCZ)
4. Possibly, water requirements satisfaction index for corn
5. Possibly, stream flow and flood risk for major watersheds

CNSA food security indicators:

Food Security Component	Indicator Categories
household income	- annual income - non-agricultural household income in rural areas
household expenditure	- food prices - household expenditure on food items - household expenditure on essential non-food items
food availability	- agricultural production - stocks - commercial imports - exports - food aid - demographics
utilization	- accessibility of health services - nutritional status - hygiene data

FEWS NET Haiti country representative:

USAID/Haiti has already allocated funding to the USAID Food and Nutrition Technical Assistance (FANTA) program, implemented by the non-profit organization Academy for Educational Development (AED), for a three-month study of how NGOs in Haiti can implement early warning systems like NEWS. Because of the impending start of a second agricultural season in the Northwest, for which decision-makers will require detailed early warning information,

it would not be helpful to delay the start of FEWS NET for this study. So, USAID/Haiti and I came to the conclusion that the three-month AED assignment should be converted to the first three months of the assignment of a FEWS NET representative.

USAID/Haiti needs to decide what mechanism to use to fund the FEWS NET representative after the three months. The FEWS NET representative could be hired through the FANTA program (AED), through the Development Assistance Program (CARE), through the USAID Rural Agricultural Incomes in a Sustainable Environment (RAISE) contract (Chemonics, Inc.), or as a USAID Personal Services Contractor (PSC). The AED, CARE, and PSC options would cost much less than the Chemonics option. On the other hand, Chemonics has a contract (entirely separate from RAISE) to hire the FEWS NET representatives in Africa and it maintains a support office in Washington for them. As a USAID PSC, the representative would depend on time-limited USAID staff for technical support. CARE is a good option, but FEWS NET will want some separation from NEWS, since it is important that NEWS continue, and since FEWS NET will be moving far beyond NEWS. AED currently operates the global food security program FANTA. AED also staffs a FANTA office in Washington, DC with food security professionals who could support the FEWS NET Haiti representative. Furthermore, AED is a non-profit organization. Considering all these options, I recommend that USAID/Haiti hire the FEWS NET Haiti country representative as an AED person under the FANTA program.

timeline for initial tasks:

by September 15–USAID/Haiti hires FEWS NET Haiti country representative

September 15–start FEWS NET Haiti web site

September 15-25–FEWS NET Haiti work plan meeting with all the Haitian partners

September 15-25–train FEWS NET representative in GIS and food security analysis

October 15–first CNSA monthly report

People encountered

David Adams, Director, USAID/Haiti

Matthew Anderson, Regional Director, Gonaïves, CARE

Eva Antoine, program assistant, USAID/Haiti

Danielle Avin, Coordinator, *Coordination National de la Sécurité Alimentaire* (CNSA)

Piard Boby, *Unité de Télédétection et de Système d'Information Géographique (UTSIG), Ministère du Plan et de la Coopération Externe*

Cecily Bryant, Assistant Country Director, CARE

Jerry Delphin, Coordinator, Northwest Early Warning System (NEWS), CARE

Marie Jose Laforest, food program monitor, USAID/Haiti

Carell Laurent, program manager, USAID/Haiti

Guy Lawson, Latin America and the Caribbean regional advisor, USAID/OFDA

Pierre-Louis Ogér, Director, *Direction des Sols, Parcs, et Forêts*

Marie-Joseph Pierre, Health and Nutrition Program Manager, World Food Program

Karl Rosenberg, program officer, CARE

Ronald Semelfort, Chief, *Section Météorologie, Service National des Ressources en Eau*

Josette Seraphin, Chief, *Section Hydrologie, Service National des Ressources en Eau*

Margareth Timmer, food program monitor, USAID/Haiti

Paul Viera, Chief, *Service de la Défens et Restauration des Bassins Versants*

Others to include in the Haiti food security network

Imvelt Chéry, Chief, *Service National des Ressources en Eau*

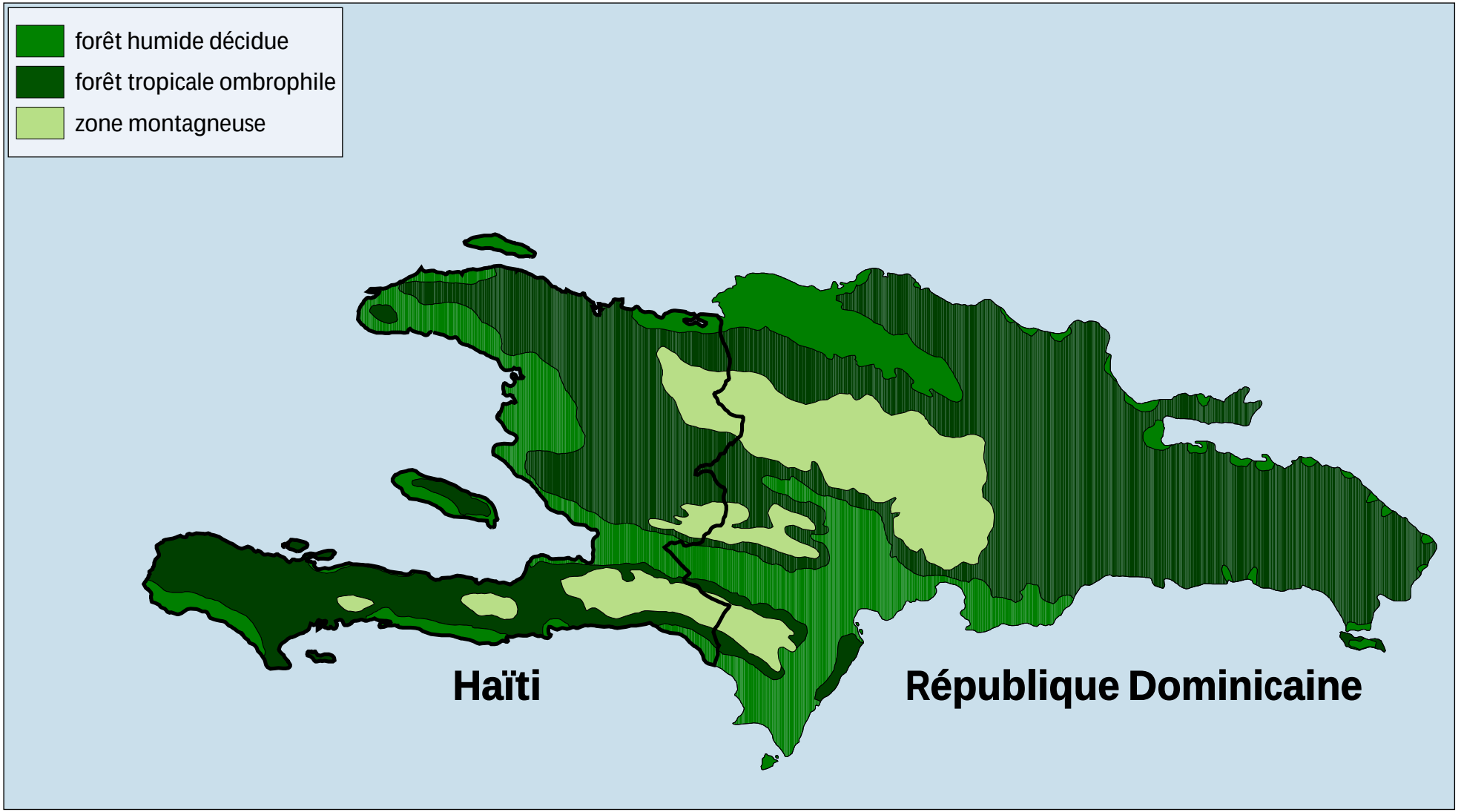
Léonne Ménager Georges, *Service de Statistiques Agricoles, Ministère de l'Agriculture, des Ressources Naturelles, et du Développement Rural*

Gina Porcena, Director, *Unité de Télédétection et de Système d'Information Géographique (UTSIG), Ministère du Plan et de la Coopération Externe*

Joseph Vernet, focal point for the U.N Convention to Combat Desertification, *Ministère de l'Environnement*

Zones Écologiques de l'Île d'Hispaniola

Végétation Potentielle



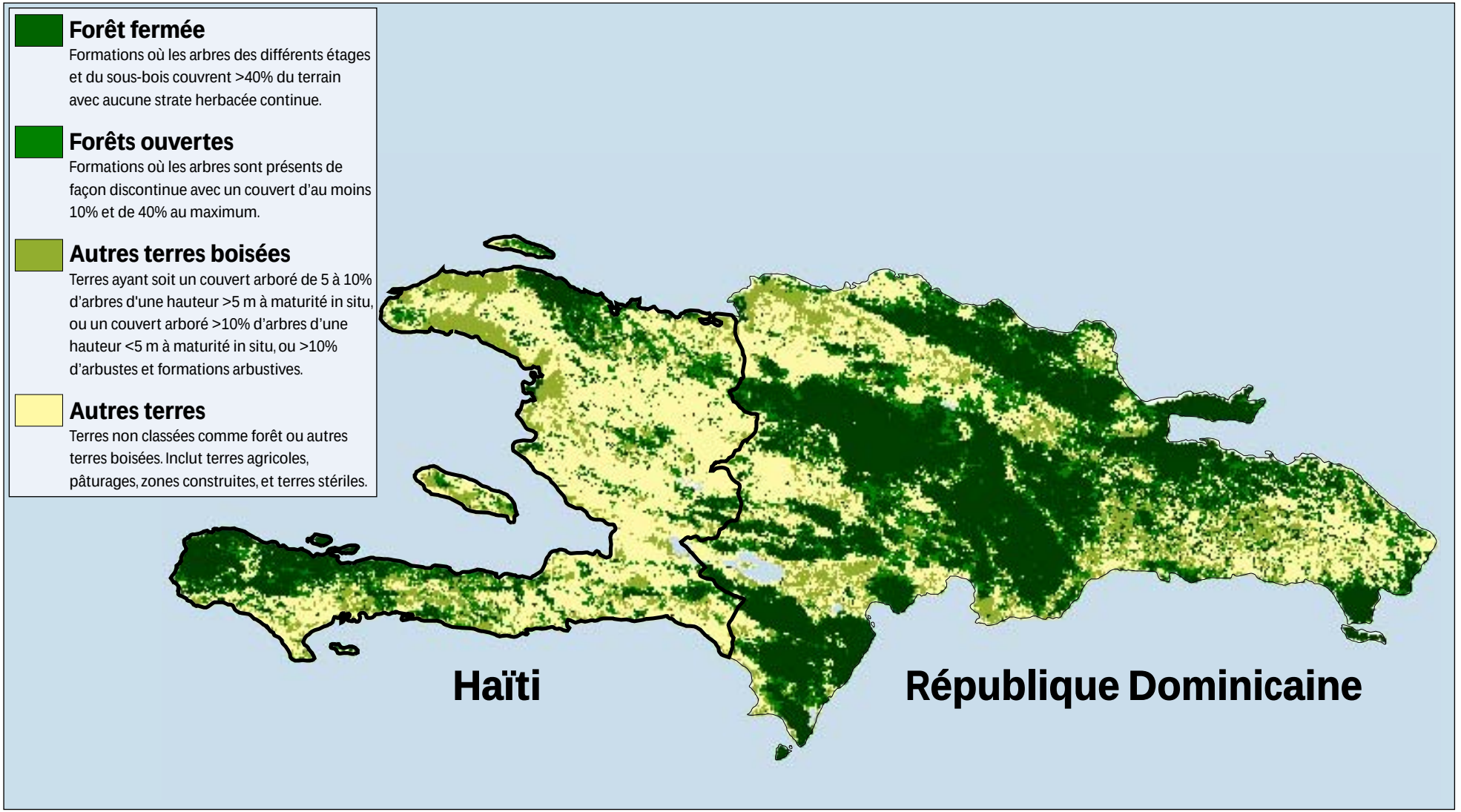
Données:
Köppen, W. 1931. Grundriss der klimakunde. Walter de Gruyter, Berlin, Germany.
White, F. 1983. The vegetation of Africa. United Nations Educational, Scientific, and Cultural Organization (UNESCO), Paris, France.

Analyses:
Food and Agriculture Organization (FAO). 2001. Global forest resources assessment 2000. FAO, Rome, Italy.

Carte:
U.S. Geological Survey, Earth Resources Observation Systems (EROS) Data Center, 2002.

Couvert Forestier de l'Île d'Hispaniola, 1993

Résolution 1 km^2



Données:
Loveland, T.R, B.C. Reed, J.F. Brown, D.O. Ohlen, Z. Zhu, L. Yang, and J.W. Merchant. 2000. Development of a global land cover characteristics database and IGBP DISCover from 1-km AVHRR data. International Journal of Remote Sensing 21: 1303-1330.
U.S. Geological Survey, Earth Resources Observation Systems (EROS) Data Center, 1999.

Analyses:
Food and Agriculture Organization (FAO). 2001. Global forest resources assessment 2000. FAO, Rome, Italy.
U.S. Geological Survey, Earth Resources Observation Systems (EROS) Data Center, 2000.

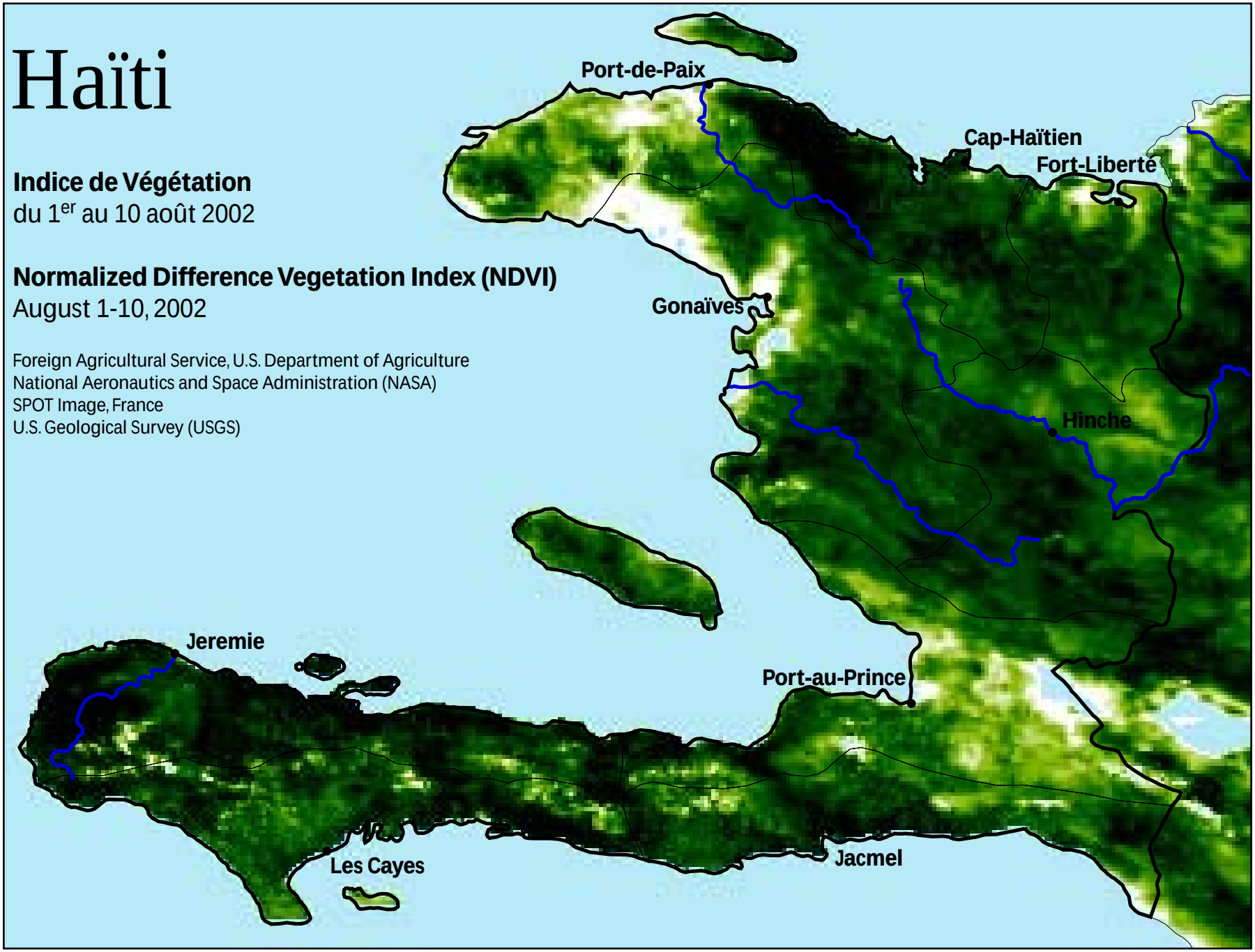
Carte:
U.S. Geological Survey, Earth Resources Observation Systems (EROS) Data Center, 2002.

Haïti

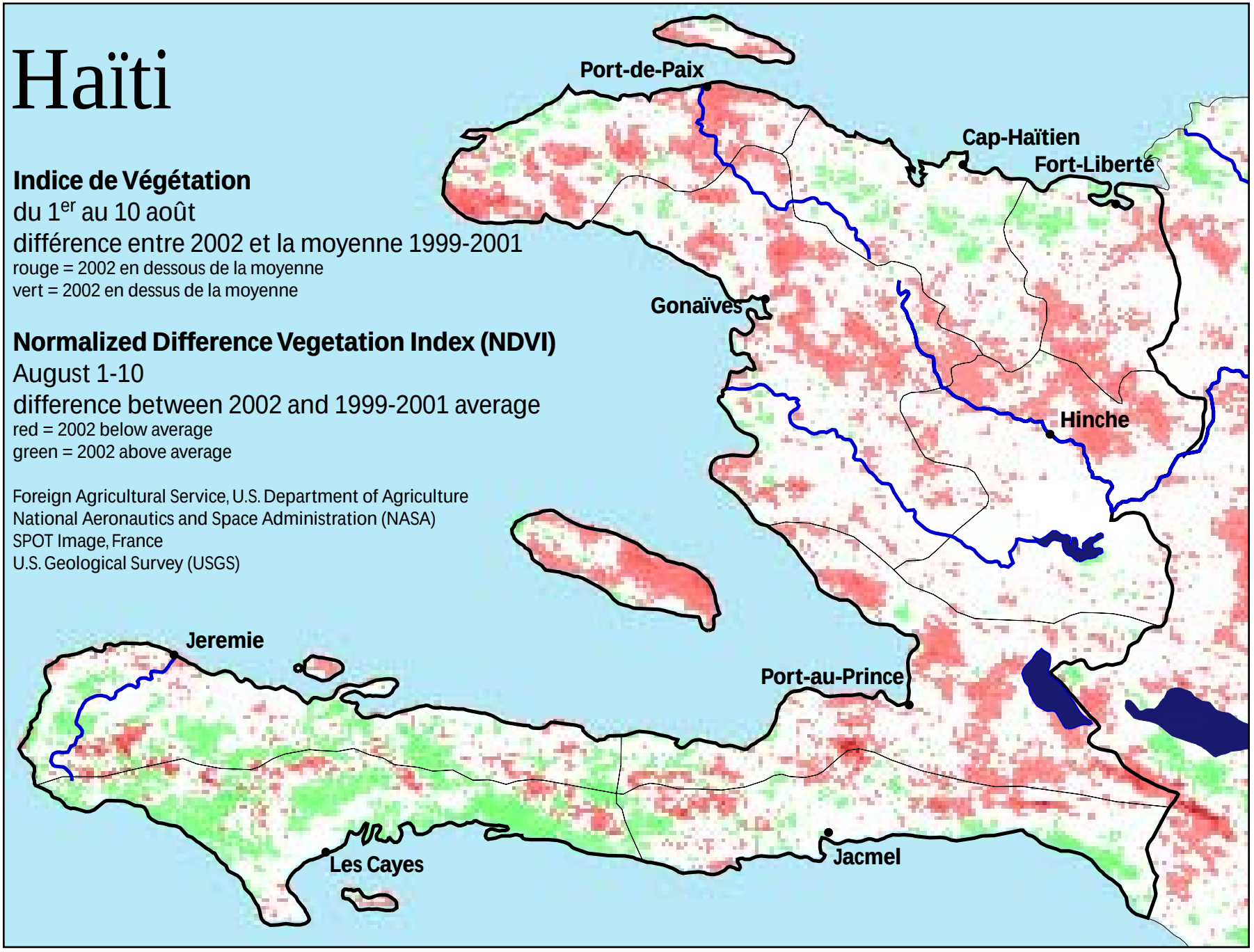
Indice de Végétation
du 1er au 10 août 2002

Normalized Difference Vegetation Index (NDVI)
August 1-10, 2002

Foreign Agricultural Service, U.S. Department of Agriculture
National Aeronautics and Space Administration (NASA)
SPOT Image, France
U.S. Geological Survey (USGS)



Haïti



Indice de Végétation
du 1er au 10 août
différence entre 2002 et la moyenne 1999-2001
rouge = 2002 en dessous de la moyenne
vert = 2002 en dessus de la moyenne

Normalized Difference Vegetation Index (NDVI)
August 1-10
difference between 2002 and 1999-2001 average
red = 2002 below average
green = 2002 above average

Foreign Agricultural Service, U.S. Department of Agriculture
National Aeronautics and Space Administration (NASA)
SPOT Image, France
U.S. Geological Survey (USGS)