

76 YEARS OF CONSERVATION HISTORY



USVI



USVI



PR

Caribbean Area: Puerto Rico & US Virgin Islands

Soil Conservation Service
Natural Resources Conservation Service
Helping People Help the Land



PR

DEDICATION

“To those SCS/NRCS employees, partners and friends who placed the cornerstone for conservation in the Caribbean Area”

... EDWIN ALMODÓVAR, DIRECTOR, 2010-PRESENT

United States Department of Agriculture
Natural Resources Conservation Service
San Juan, PR
December 2011



CONTRIBUTORS

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Photo credits: Library of Congress. USDA SCS/NRCS publications. Field Offices, Soil and Water Conservation Districts.

BEFORE SCS IN THE CARIBBEAN AREA



- 1903. First Soil Survey. Authors: Dorsey, C.W., Mesmer, L. and Caine, T.A.. *Soil Survey from Arecibo to Ponce Porto Rico* USDA, Agr, Bur. Soils Field Oper. 1902 Report 4:793-839, illus.

THE BEGINNING

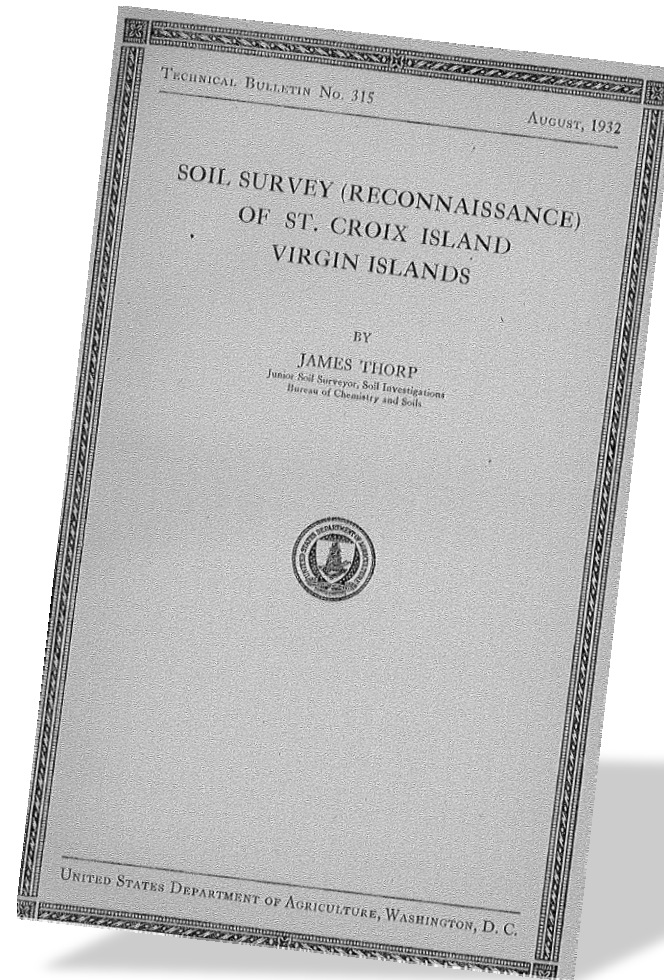
- 1908. Academics were interested in soil erosion problems. Geologist T. C. Chamberlain speaks in the White House about erosion hazards.
- 1928. Hugh Hammond Bennett – Soil Scientist and Surveyor and W.R. Chapline coauthored a USDA publication: *Soil Erosion: A National Menace*. This made possible the authorization and establishment of Soil Erosion Experiment Stations across the Nation.
- 1929. H.H. Bennett works towards legislation to establish conservation methods. Congress passed an amendment to the Agricultural Appropriations Bill that provided \$160,000 for investigation of soil erosion control under the Bureau of Soils of the US Department of Agriculture.



Gully erosion in PR

BEFORE SCS IN PR & USVI

💧 1932. USDA
Publication: *Soil
Survey
(Reconnaissance) of
St. Croix Island,
Virgin Islands* by
James Thorp



SOIL EROSION SERVICE (SES)

- 💧 Conservation work starts through: Work Projects Administration (WPA) and Civilian Conservation Corps (CCC). (Great Depression).
- 💧 *1933, September 13th*. Soil Erosion Service (SES) was established with 5M for conservation. The Bureau of Soils was transferred to the SES under the Department of the Interior.
- 💧 *1935, March 25th*. SES is transferred to the Department of Agriculture by order of the Secretary of the Interior.

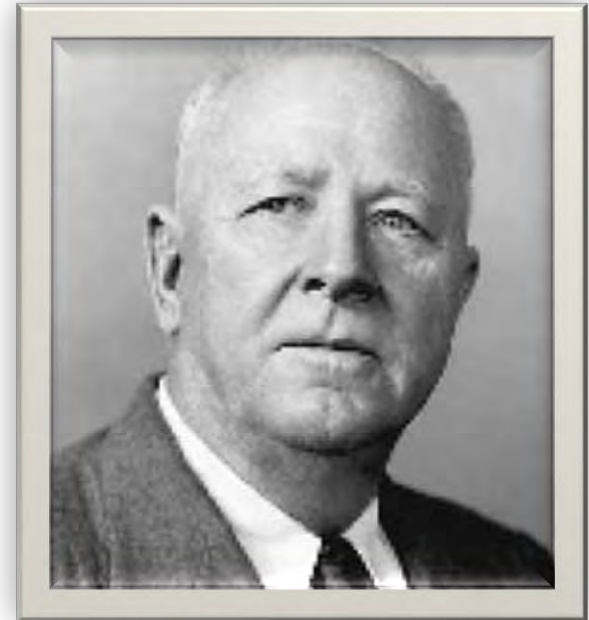


Dust Bowl

CREATION OF SCS

💧 1935, April 27th. President F. D. Roosevelt approves the Soil Conservation Law No.46-74. The Soil Erosion Service is abolished, with functions transferred to newly established Soil Conservation Service (SCS) implementing provisions of the Soil Erosion Act (49 Stat. 163), also known as the Jones-Dempsey Soil Erosion Act.

💧 1935. H.H. Bennett appointed Chief until 1951. Bennett regarded as the “Father of soil conservation”. Died in 1960.



Chief Hugh H. Bennett

SCS IN PR & USVI

- 💧 1935. George L. Crawford, was designated in charge of SCS in PR & USVI. There were 731,648 cultivated acres in PR. Conservation efforts in CB begin 24 years before 2 States: Hawaii and Alaska.
- 💧 1936 (September). Establishment of Civilian Conservation Corps Camp (CCC) at Cerro Las Mesas, Mayagüez. 200 persons working and learning farming in 35% slopes. CCC were authorized by the Emergency Employment Act of March 1933, the same year SES was formed. CCC provided work for young men and unemployed veterans of World War I.
- 💧 1936. Establishment of the: *Comité Consejero de Conservación de Suelos*, de PR: Administración de Reconstrucción de Puerto Rico (PRRA), Estación Experimental Agrícola (EEA), Servicio Forestal (SF), Fomento Agrícola, Departamento de Agricultura y Comercio, Estación Experimental Federal, Agencia Federal para Reajustes Agrícolas, UPR Mayagüez y SCS. (Today known as the State Technical Committee).

SCS IN PR & USVI

- 💧 1937. Recognizance Survey in PR is completed.
- 💧 1937-38. SCS & Puerto Rico Reconstruction Administration (PRRA) had 60 technicians and 1,500 laborers. **START FIELD WORK.**

💧1938:

- 💧34 miles of outlet channels protecting 996 acres
- 💧73 miles of hillside ditches protecting 273 acres
- 💧551 miles of diversion terraces protecting 173 acres
- 💧8 miles of ridge terraces protecting 73 acres
- 💧28 miles of bench terraces protecting 268 acres
- 💧93 miles of vegetable barriers protecting 205 acres
- 💧7,276 miles of contour tillage protecting 7,772 acres
- 💧8 miles of wattles protecting 136 acres
- 💧2,280 lineal feet of retaining wall
- 💧37 acres of individual coffee terraces
- 💧collection of 32,000,000 bamboo cuttings



SCS 1938, La Plata project of the Puerto Rico Reconstruction Administration (PRRA). Soil conservation experts at work.

SCS IN PR & USVI

💧 1938 (june 1). Start field observation works in Soil Erosion at the Soil Erosion Station, Mayagüez & Agricultural Experiment Station, Río Piedras. (sweet potatoes, sugar cane, pumpkin, tobacco) y and soil stabilization. Some of the work was:

- Growth habit and nutritional value of forages
- Runoff water
- Terracing
- Vegetative barriers



Plots to measure soil erosion at Soil Erosion Station, Mayagüez, PR. (Finca Las Ochenta, adjacent to PR Zoological Park)

35-42% slope, 51.86' X 12' (0.70 acre)

SCS IN PR & USVI



*Cultivating legumes for food and cover.
USVI, 1939*



*Contour bench terraces at the Soil Erosion Station,
Mayagüez. "Las Ochenta Farm". 1936-38*

SCS IN PR & USVI

- 1938. Begin local studies in soil erodibility, physical and chemical properties by Chester A. Price, Junior Soil Surveyor
- 1940's. UPR Mayagüez, established agricultural practices at Campus
- 1940's. Instituto Politécnico de San Germán offered Soil Conservation courses
- 1941 publication of: *La Conservación del Suelo en PR*. J.B. Nolla & G.L. Crawford. Preface by H.H. Bennett



Grasslands, USVI, Charlotte Amalie. 1941



Planting tomatoes following the contour. Yauco, PR. 1939

SCS IN PR & USVI



Lorenzo Vizcarrondo (left.), President SWCDA & C. Douglas Hole, Director SCS, 1940's. Presenting the publication: "The Future of Districts".



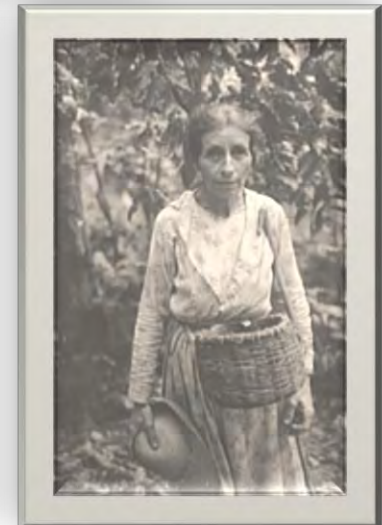
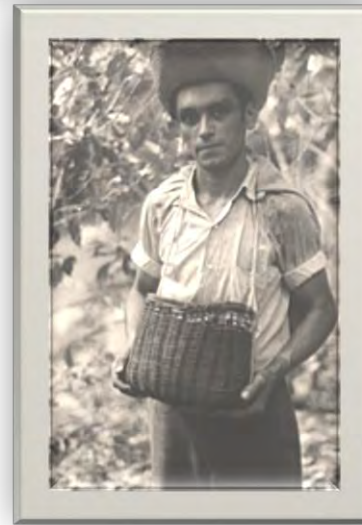
*Contour farming demonstration using oxen.
1940's*

SCS IN PR & USVI

- 1941. There are 2,000 farms under conservation in PR and USVI. (Hillside ditches, crop rotation, etc.)
- 1941 publication of: *Métodos Modernos para Conservación de Suelos en PR*. USDA SCS.
- 1941. Agricultural Agents help to maintain conservation measures.
- 1941. Vocational Schools established conservation methods in 116 schools in PR.



*Cultivating.
Frederiksted,
St. Croix. 1941*



Coffee pickers, PR. 1941

SCS IN PR & USVI

Corozal, 1941



Utualdo, 1941



USVI, 1941



Arecibo, 1941

RÍO LOCO WATERSHED, 1942

GUÁNICA BAY



1942



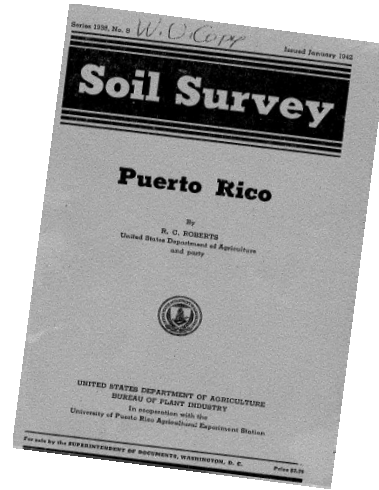
2011

SCS IN PR & USVI

💧 1942. *Soil Survey of PR in cooperation with UPR Mayagüez*. Series 1936- No. 8. R.C.

Roberts

💧 1943. Demonstration Projects are established by the *Civilian Conservation Corps* (CCC): 1,178 in PR & 12 in USVI

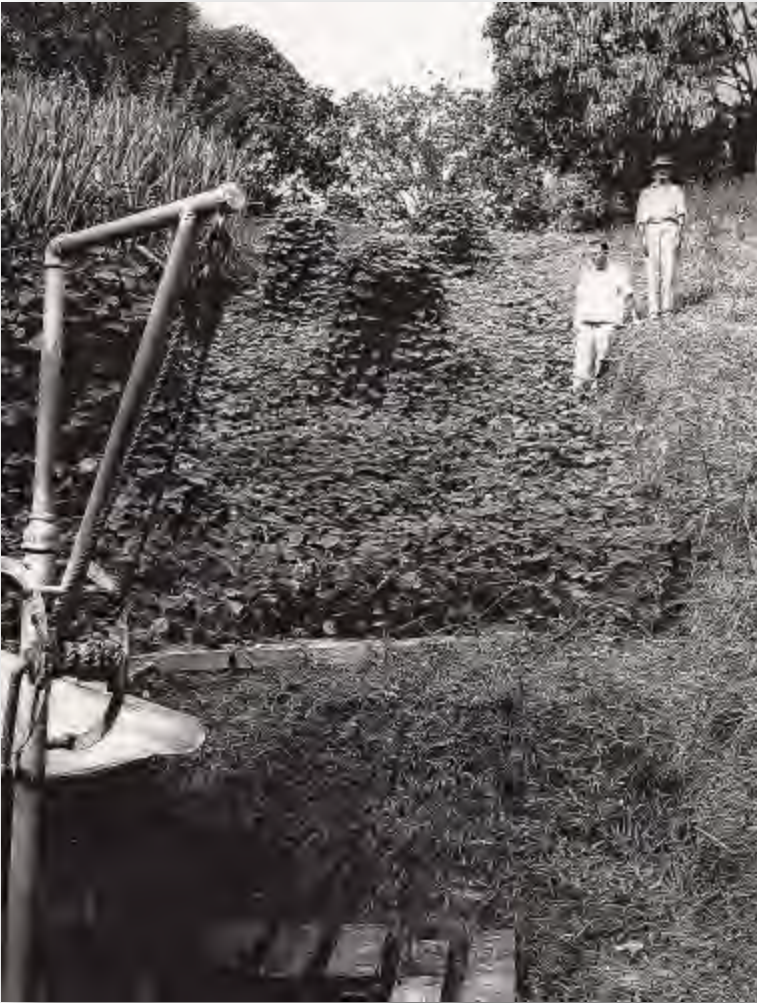


Cultivating tobacco at contour, Barranquitas, PR 1941



La Plata Project, 1940's

SCS IN PR & USVI

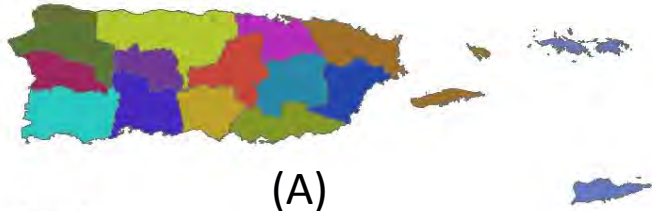


- 1945. SCS manage demonstration projects at the Soil Erosion Experiment Station, Mayagüez (TARS), on cover crops and grazing.



💧 1946. Foundation of PR Conservation Districts by Law No. 211
 March 26. Don Zacarías Rivera, became the first Soil and Water
 Conservation District president.

Distritos de Conservación de Suelo y Agua



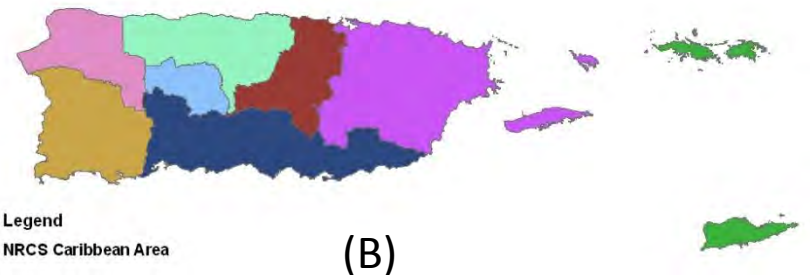
Legend

Distritos de Conservación de Suelos y Agua

- Distrito Atlántico y Norte
- Distrito San Juan
- Distritos Torito y Turabo
- Distritos Cibuco y Torrecillas
- Distrito Sudeste
- Distrito Este
- Distrito Caribe
- Distrito Noreste
- Distrito Oeste
- Distrito Sur
- Distrito Suroeste
- Distrito Culebrinas y Noroeste
- Distrito Islas Vírgenes
- Distrito Caonillas



USDA - NRCS Caribbean Area Field Offices



Legend

NRCS Caribbean Area

Field Offices

- Arecibo Service Center
- Caguas Service Center
- Corozal Service Center
- Juana Díaz Service Center
- Mayaguez Service Center
- San Sebastián Service Center
- St. Croix Service Center
- Utuado Service Center



(A, B) 2011 Conservation Districts and Field Offices

SCS IN PR & USVI

💧 1951. There were 5,474 active Conservation Plans in PR and 326 in USVI with 166, 800 total acres.

💧 2011. There are 3,711 active Conservation Plans.



Cultivating tobacco, Cayey, PR. 1940's-50's

1953. FORMER GOVERNOR OF PUERTO RICO, HON. LUIS MUÑOZ-MARÍN IN THE
ANNUAL SOIL CONSERVATION DISTRICTS ASSOCIATION MEETING. MR. ZACARÍAS RIVERA
(RIGHT) PRESIDENT PRSCDA.
SAN JUAN, PR



SCS MAYAGÜEZ EXPERIMENT STATION



1950'S



2000'S

SCS IN PR & USVI

- 💧 1954. Public Law 566, the Watershed Protection and Flood Prevention Act provided authorization for the SCS to assist Soil Conservation Districts and other sponsors in planning and carrying out projects for watershed protection, flood prevention, sediment control, drainage and storage of water for water supply, recreation, fish and wildlife, stream flow augmentation and irrigation.
- 💧 1958. Publication of: *Manual de Conservación de Suelos*. William X. Hull.
- 💧 1961 July. Publication of: *Glosario de Conservación de Suelos y Aguas* (Inglés – Español). Soil Conservation Society of America. Puerto Rico members. William H. Gracia, Cahirman. M.Pérez-García, J. Amedee Bonnet, Jaime Bague, José A. González-Saldaña, J. F. Marrero
- 💧 1962. Resource Conservation and Development (RC&D) program was authorized in the Farm Bill (Farm and Agriculture Act). SCS was given authority to give technical and financial assistance to local groups for conservation and development of natural resources in their area. RC&D Councils in the Caribbean Area: USVI RC&D, El Caribe RC&D, El Atlántico RC&D. 2010, Councils ended functions.

1965, JULY 2ND. USVI SOIL & WATER CONSERVATION DISTRICT FOUNDATION

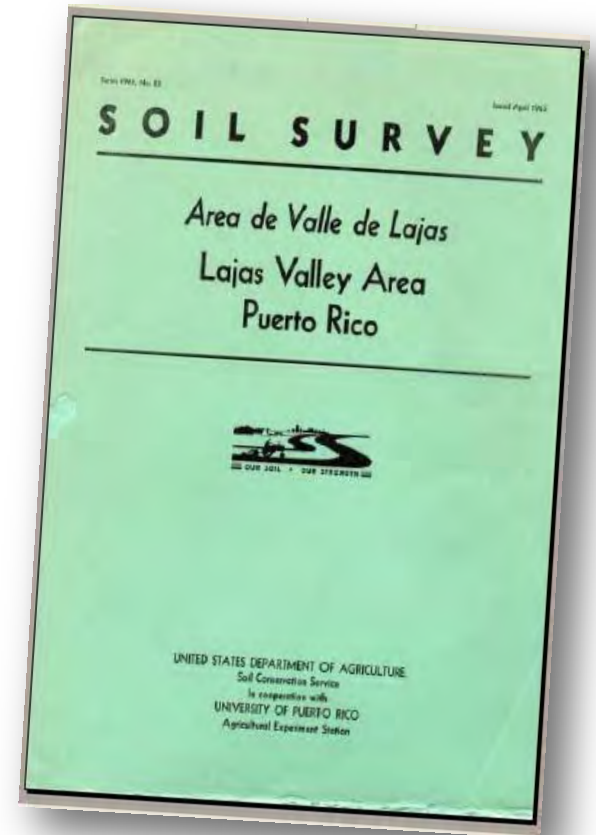


MEMBERS OF THE LOCAL CONSERVATION DISTRICT are shown Friday at Government House where they held an organizational meeting. Hans Lawaetz was elected chairman of the Board of Supervisors of the V.I. Soil and Water Conservation District. Henry Nelthropp, was elected vice chairman and Degaulle Brin, secretary treasurer.

(Daily News Photo)

SCS IN PR & USVI

- 💧 *1965. Soil Survey-Lajas Valley Area PR (Oliver R. Carter)*
- 💧 *1969. First irrigation system established in PR. (Luciano Fuerte Farm, Coamo)*
- 💧 *1969. Detailed soil survey and descriptive legend of the AES farms UPR Mayagüez Campus: Adjuntas, Corozal, Fortuna, Gurabo, Isabela, Lajas, Río Piedras: Maps and Legends*
- 💧 *1973. Añasco River Watershed Supplemental Work Plan (Sediment Basin studies)*



1970'S RETIREMENT OF ED KEIL SCS DIRECTOR (LEFT). HANS LAWAEZT USVISWCD CHAIRMAN AND ANGEL HUMBERTO QUINTERO (NEW DIRECTOR)



ED KEIL RETIRES

A good friend of the Virgin Islands Conservation District retired recently -- Ed Keil, Caribbean Area Director of Soil Conservation Service. Ed participated in the formulation and implementation of the V. I. Environmental Protection Law as well as the realization of the V. I. RC&D Project.

District Chairman Hans Lawaetz flanked by Ed Keil (l.) and Bert Quintero (r.)

soil conservation movement. Ed's geographic experience covers much of New York State, Maryland and most recently, the Caribbean area.

Ed's career with SCS spanned some thirty-seven years, beginning in the late 30's in the early stages of the soil conservation movement. Replacing Ed Keil is Angel (Bert) Quintero, a native son of Puerto Rico, who is already working closely with the District. Bert has worked throughout Puerto Rico and the Virgin Islands as well as in Florida.

We look forward to working closely with Bert Quintero and wish Ed Keil the best in his well-earned retirement.

EARLY 1970'S PLANNING CONFERENCE



SCS IN PR & USVI

- 💧 *1975. Soil Survey Mayagüez.* R. Gierbolini, G. Acevedo-Ramos, J. Torres-Más, E. Ortíz-Torres, J.E. Trigo, W. Francia-Rivera, J.E. Brunet & L.H. Rivera
- 💧 *1976. Añasco River Watershed Environmental Statement (Construction)*
- 💧 *1977. Clean Water Act. Programs to be carried out to eliminate discharge of pollutants to waters of the USA.*
- 💧 *1977. Soil Survey Humacao.* R. A. Boccheciamp, W. Francia, J. E. Trigo, J.E. Brunet, E. Ortíz-Torres, W.E. McKenzie & L.H. Rivera



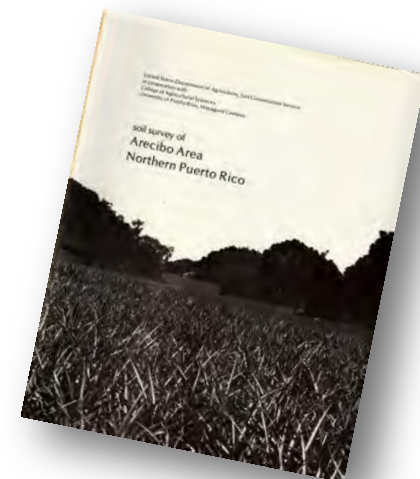
*Soil description, William McKenzie,
1964 USVI*

SCS IN PR & USVI

- 💧 1978. *Soil Survey San Juan*. R. Boccheciamp, W. Francia-Rivera, J. E. Trigo, G. Torres-Ricci, J. E. Brunet & L.H. Rivera
- 💧 1978. Daguey Dam (WF-08) Añasco, PR completed
- 💧 1979. *Soil Survey Ponce*. R. Gierbolini, G. Acevedo, J. Torres-Más, E. Ortíz-Torres & L.H. Rivera
- 💧 1981. *Guayanés River Watershed-Plan and Environmental Impact Statement*
- 💧 1982. *Soil Survey Arecibo*. G. Acevedo, R. Gierbolini, J. Torres-Más, A. Santana, W. Francia-Rivera, J.E. Trigo, G. Torres-Ricci & L.H. Rivera



Daguey Dam, Añasco, PR

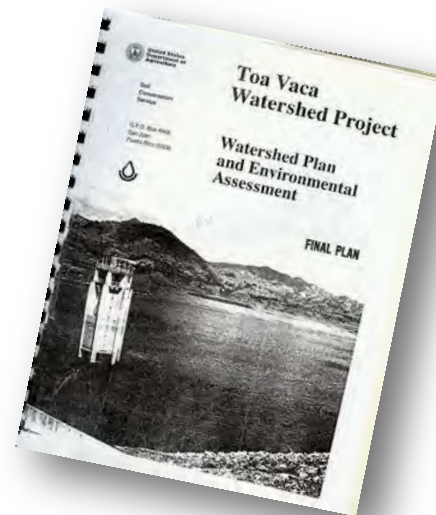


SCS IN PR & USVI

- 💧 1984. Ajíes Dam (WF-08), Añasco River Watershed Project completed
- 💧 1985. Food Security Act was signed into Law. Established CRP, WRP. “Swampbuster”
- 💧 1989. *Toa Vaca Watershed Project (Watershed Plan and Environmental Assessment)*
- 💧 1990. *La Plata Lake Watershed*



Ajíes Dam, Añasco, PR



1991, PLANNING CONFERENCE
(JUNE 16-20), CONDADO BEACH HOTEL



THE CREATION OF A NEW AGENCY

- 💧 1993-95. SCS distributes over 1 M Vetiver plants for conservation purposes in PR & USVI – Release named “Sierra” after Mr. Aurelio Sierra-Bracero
- 💧 1994. October 20th. The “Department of Agriculture Reorganization Act” creates NRCS



Vegetative barrier made of vetivergrass or Pacholi

NRCS IN PR & USVI

💧 1995. Carraízo Lake Watershed Assessment-Cooperative River Basin Study and, Forest Management for Erosion Control

💧 1995. Former Chief Paul Johnson (3rd. from left) visit USVI



NRCS IN PR & USVI

- 1996. Farmbill established the Environmental Quality Incentive Program (EQIP) and the Wildlife Habitat Incentive Program (WHIP)
- 1999. NRCS Soil Survey Program Centennial. Bayamón and Victory soil series are designated representative soils for Puerto Rico and the USVI respectively. (Bayamón soil series designated by PR Act 115 May 1999)



Victory Soil Series



Bayamón Soil Series

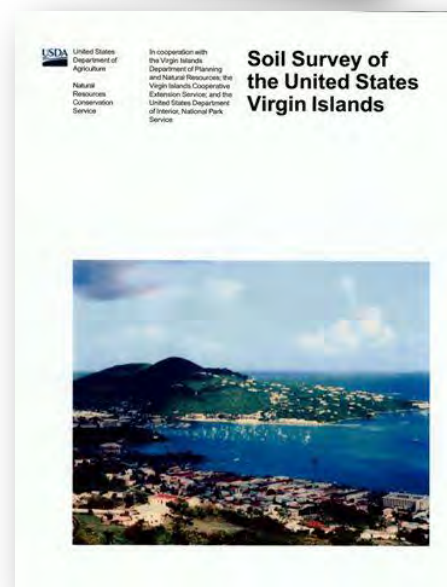
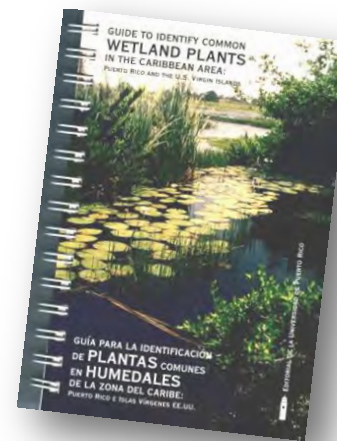
NRCS IN PR & USVI

- 2000. *Manual de Conservación de Recursos Naturales: Enfoque Ambiental de la Agricultura* . J. A. Castro
- 2000. EWP Funds Invested in CB from 1988 to 2000 equal \$31,938,000.M
- 2000. Boca Velázquez Project completed



NRCS IN PR & USVI

- 💧 2001. NRCS Editor. *Guide to Identify Common Wetland Plants in the Caribbean Area: Puerto Rico & US Virgin Islands*
- 💧 2001. *Soil Survey Camp Santiago*. D.C. Parisek & T. Leschin
- 💧 2002. *Soil Survey of the USVI*. J. Davis & C. L. Santiago
- 💧 2002. *Soil Survey Caribbean National Forest*. L. Hoffaker



NRCS IN PR & USVI

💧 2003. Río Culebrinas-Coloso Valley Watershed Assessment

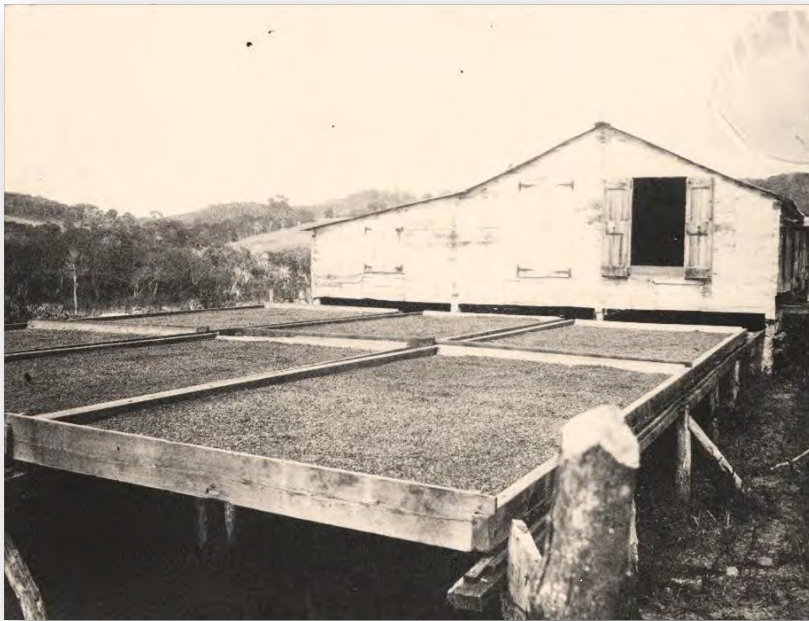


Contour farming for yams. Coloso Valley, Aguada, PR

💧 2002-2003. Bethlem EWP. St. Croix, VI.



2005 (FEBRUARY 4TH.) FIRST ECOLOGICAL COFFEE DEVICE ESTABLISHED IN THE CARIBBEAN AREA. MS. ESTHER JIMÉNEZ TORO FARM, CAGUANA, UTUADO.



Coffee drying 1890



Coffee berries



Ecological Coffee Device

NRCS IN PR & USVI

💧 2005. Juana Díaz Earmark (Luciana-Amelia) Project completed

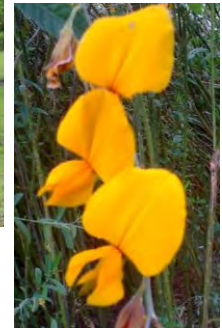
💧 2005. Santa Isabel EQIP Special Project completed



Open channel

NRCS IN PR & USVI

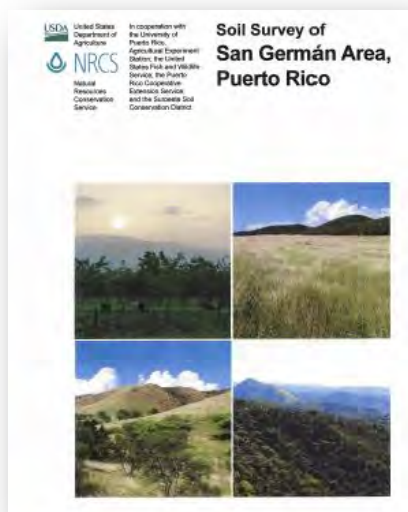
- 2005. *Puerto Rico Erosion and Sediment Control Handbook for Developing Areas.* EQB & NRCS
- 2006. *Guía Ilustrada para Identificar Yerbas en PR.* E. Más & O. García-Molinari
- 2006. Start Conservation Innovation Grants State Component. About 1M granted in 6 yrs
- 2008. CB NRCS Soil Surveys (1999 to 2008), published digitized and certified (SSURGO)



State Component CIG's

NRCS IN PR & USVI

- 💧 *2008. Soil Survey of San Germán Area (Former Lajas Valley Area). J. Lugo-Camacho, S. Ríos-Tirado & M. Cortés-Colón*
- 💧 *2010. Luis J. Carrasquillo Award is established after District Conservationist L. J. Carrasquillo.*



Luis J. Carrasquillo

RÍO LOCO PROJECT, US CORAL REEFS TASK FORCE (USCRTF) NOV. 2009



Partners:

NOAA
PRLA
PRDNER
PRDA
Sea Grant PR
Guánica Local Gov.
Yauco Local Gov.
NGO's
Suroeste SWCD
FWS
UPR Marine Sciences
UPR AES



WETLAND RESERVE PROGRAM (IRST. WRP), COMBATE, CABO ROJO, 1999

Conservation Partners:

- USFWS
- USDA NRCS
- Caborrojeños Pro Salud y Ambiente
- Suroeste SCD
- NGO's



Photo: USFWS

2007-2012, JBCEAP, SALINAS, PR.

Jobos Bay Conservation Effects Assessment Project: Tropical Special Emphasis Watershed (1.3 M)



CEAP Partners signing agreement



Irrigation system



Cowpea



Sampling well

Conservation Partners:

- USDA – ARS
- USDA – NRCS
- NOAA – Coral Reef
- USGS
- USFWS
- JBNERR
- AES- UPRM
- PREQB
- PR Land Authority
- PRDNER
- UPRM
- Sea Grant PR
- Ayala Forage Farm, Inc.
- Sudeste SWCD

DECEMBER 7, 2011 NRCS ALL EMPLOYEES MEETING, SAN JUAN, PR





CARIBBEAN AREA DIRECTORS

- *1935*, George L. Crawford
- *1940's*, C. Douglas Hole
- *1950's*, U.S. Allison
- *1957's*, R. L. Von Tabra
- *1960-66*, Harry M. Chambers
- *Late 1960's-74*, Eduard Keil
- *1974*, Angel H. Quintero
- *1978-1992*, Iván R.Emmanuelli, Jerome Arledge, Jeffrey Vonk
- *1988*, Humberto Hernández
- *1992-2009*, Juan A. Martínez
- *2010 - Present*, Edwin Almodóvar

Acting Directors

- José J. Acevedo
- Richard Balduzzi
- Angel Figueroa

CARIBBEAN AREA DIRECTORS GALLERY



From upper left: *C. Douglas Hole, R.L. Von Tabra, Eduard Keil, Humberto Quintero, Jeffrey Vonk, Humberto Hernández, Juan A. Martínez and Edwin Almodóvar*

SOURCES OF INFORMATION

- 💧 Allison, U.S., 1950. *Soil Conservation and Fertility:II. Soil Conservation Programme in Puerto Rico*. A Paper Prepared at the Request of The Caribbean Commission for the West Indian Conference (Fourth Session) Curacao, NWI.
- 💧 Bennett, H.H., 1937. *Report of the Chief of the Soil Conservation Service*. USDA. US Government Printing Office. Washington , DC
- 💧 Bennett, H.H., 1938. *Report of the Chief of the Soil Conservation Service*. USDA. US Government Printing Office. Washington , DC.
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- 💧 Bennett, H.H., 1943. *Report of the Chief of the Soil Conservation Service*. USDA. US Government Printing Office. Washington , DC.
- 💧 Bennett, H.H., 1945. *Report of the Chief of the Soil Conservation Service*. USDA. US Government Printing Office. Washington 25 , DC.
- 💧 Bennett, H.H., 1947. *Report of the Chief of the Soil Conservation Service*. USDA. US Government Printing Office. Washington 25 , DC.
- 💧 Bennett, H.H., 1948. *Report of the Chief of the Soil Conservation Service*. USDA. US Government Printing Office. Washington 25 , DC.
- 💧 Bennett, H.H., 1951. *Report of the Chief of the Soil Conservation Service*. USDA. US Government Printing Office. Washington 25 , DC.
- 💧 Berríos, Angel T. 1968. *Manual de Supervisores: Distritos de Conservación de Suelos y Agua*. SEA UPRM
- 💧 Clarence W. Dorsey, Louis Mesmer, and Thomas A. Caine. 1902. *Soil Survey from Arecibo to Ponce, Porto Rico*. Bureau of Soils
- 💧 Crawford, G. L., et. al. 1941. *Métodos Modernos para Conservación de Suelos en PR*. USDA SCS.
- 💧 Helms, Douglas. 1992. *Readings in the History of the Soil Conservation Service*. USDA Soil Conservation Service. Economics and Social Sciences Division, NHQ. Historical Notes Number 1.
- 💧 Library of Congress, 2011. <http://www.loc.gov/search/?q=Puerto%20Rico&fa=digitized:true>
- 💧 Nolla, J.A.B. and G.L. Crawford, 1941. *La Conservación del Suelo en PR*. USDA SCS
- 💧 Thorp, J. 1932. *Soil Survey (Reconnaissance) of St. Croix Island, Virgin Islands*. Tech. Bull. 315. USDA, Washington, DC
- 💧 The New York Times, 1937. *Puerto Rican Farmland Restored to Cultivation*. December 20, 1937, NY
- 💧 USDA NRCS, 2010. *Wisconsin Conservation History*

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