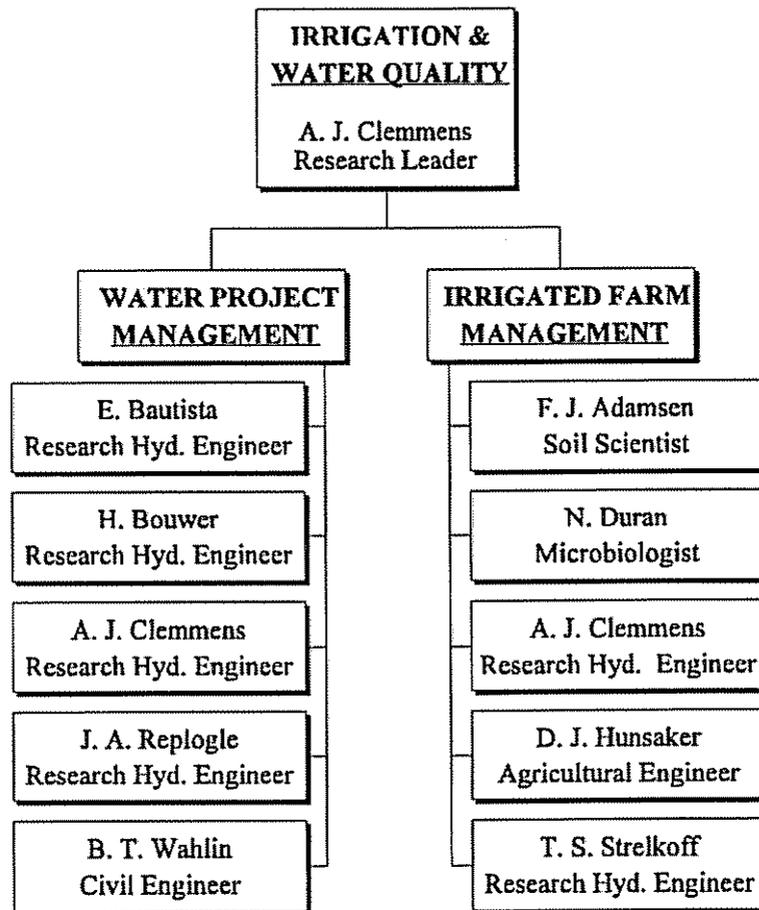


I&WQ Management Unit

I&WQ Organization



Mission

The mission of the Irrigation and Water Quality Research Unit is to develop management strategies for the efficient use of water and the protection of groundwater quality in irrigated agriculture. The unit addresses high priority research needs for ARS's National Programs in the area of Natural Resources & Sustainable Agricultural Systems. The unit primarily addresses the Water Quality and Management National Program. It also addresses the application of advanced technology to irrigated agriculture.

I&WQ RESEARCH STAFF



FLOYD J. ADAMSEN, B.S., M.S., Ph.D., Soil Scientist

Management practices that reduce nitrate contamination of groundwater while maintaining crop productivity; application of 100% irrigation efficiency; winter crops for the irrigated Southwest that can be double-cropped with cotton; contributions of natural and urban systems to nitrate in groundwater.

EDUARDO BAUTISTA, B.S., M.S., Ph.D., Research Hydraulic Engineer

On-farm irrigation system hydraulic modeling; hydraulic modeling of irrigation delivery and distribution systems; control systems for delivery and distribution systems; effect of the performance of water delivery and distribution systems on-farm water management practices and water use efficiency; integrated resource management and organizational development for irrigated agricultural systems.

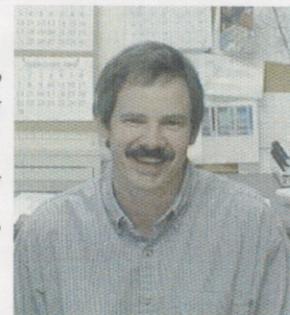


HERMAN BOUWER, B.S., M.S., Ph.D., P.E., Chief Engineer and Research Hydraulic Engineer

Water reuse; artificial recharge of groundwater; soil-aquifer treatment of sewage effluent for underground storage and water reuse; effect of groundwater pumping on stream-flow, surface and groundwater relations.

ALBERT J. CLEMMENS, B.S., M.S., Ph.D., P.E., Laboratory Director, Research Leader for Irrigation and Water Quality, and Supervisory Research Hydraulic Engineer

Surface irrigation system modeling, design, evaluation, and operations; flow measurement in irrigation canals; irrigation water delivery system structures, operations management, and automation.

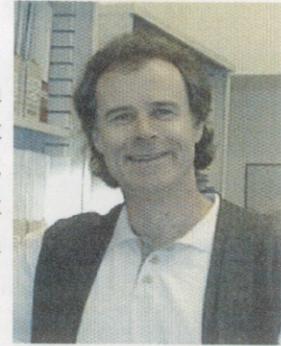


NORMA L. DURAN, B.S., Ph.D., Microbiologist

Wastewater irrigation; molecular detection of waterborne pathogens; pathogen regrowth assessment in water distribution systems; fate and transport of pathogens in the subsurface environment.

DOUGLAS J. HUNSAKER, B.S., M.S., Ph.D., Agricultural Engineer

Effects of soil and irrigation spatial variability on crop water use and yield in large irrigated fields; level basin irrigation design and management procedures for applying light, frequent water applications to cotton; CO₂ effects, in particular, of evapotranspiration in the free-air CO₂ enrichment (FACE) environment; evaluation of water requirements and irrigation management of new industrial crops--lesquerella and vernonia.

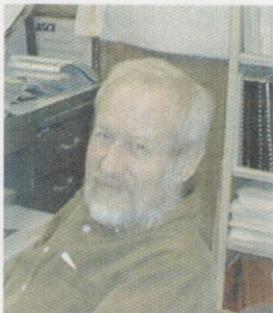


JOHN A. REPLOGLE, B.S., M.S., Ph.D., P.E., Chief Scientist and Research Hydraulic Engineer

Flow measurement in open channels and pipelines for irrigation; irrigation water delivery system structures, operations, and management.

ROBERT J. STRAND, B.S., Electrical Engineer

Automatic control of irrigation delivery systems; development and integration of field sensors, intelligent field hardware, USWCL feedback and feedforward control software, and commercial supervisory control software to create a plug-and-play control system.



THEODOR S. STRELKOFF, B.C.E., M.S., Ph.D., Research Hydraulic Engineer

Surface-irrigation modeling: borders, furrows, two-dimensional basins; erosion and deposition; design and management of surface-irrigation systems; canal-control hydraulics; flood-routing methodologies; dam-break floodwaves; flow in hydraulic structures.

BRIAN T. WAHLIN, B.S., M.S., Civil Engineer

Flow measurement in open channels and pipelines for irrigation; irrigation water delivery system structures, operations, and management.



IRRIGATED FARM MANAGEMENT ANALYTICAL LABORATORY

K. Johnson, S. Colbert, and J. Askins, Physical Science Technicians; K. VanMeeteren, Biological Science Technician; and A. Jacques, Physical Science Technician

Following is a description of the functions of the Irrigated Farm Management (IFM) Analytical Laboratory. The IFM Lab is staffed by the technicians listed above, two of whom are students.

High performance liquid chromatography (HPLC) is used to test for nitrate and other anions in soil samples. The autoanalyzer utilizes colorimetry to determine nitrate, and ammonium, and bromide content of water samples and extracts of soil samples. Three stations allow collection of data from weighings directly into a spreadsheet. The extraction step has been aided by replacement of two centrifuges. C¹³ and N¹⁵ analyses are run on the isotope ratio mass spectrometer.

In addition to running and maintaining instruments, research technicians process data and address the precision of the data. Technicians also weigh soil samples, collect samples in the field, help with irrigation and other field work, write and update protocols for both reference and training, count seeds, and perform numerous other duties as needed. Facilities in this lab are sometimes used by other groups, and occasionally a technician from another group with extra time will lend a hand here.