COLOQUIOS *OBSERVATORIO DEL AGUA* FB / COLLOQUIUM *WATER OBSERVATORY* BF

FUNDACIÓN BOTÍN

OBSERVATORIO DEL AGUA
WATER OBSERVATORY

Los Coloquios del Observatorio del Agua de la Fundación Botin ofrecen una plataforma de debate donde expertos nacionales e internacionales dan una clase magistral sobre temas relacionados con el la seguridad hídrica y alimentaria para luego abrir el debate con la audiencia

Programa de Verano

Martes 12 Julio, 12.00 Sala de Juntas del departamento de Geodinámica, 4ª planta Facultad de Ciencias Geológicas, Universidad Complutense de Madrid, Ciudad Universitaria:

Plano de situación:

http://www.ucm.es/centros/webs/fgeo/index.php?tp=Mapa%20de%20situaci%F3n&a=comunes/planos&d=plano.php&id=7

Thomas Harter

Robert M. Hagan Chair,
Water Management and Policy
University of California, Davis

12 Julio 2011 12.00 h

Sala de Juntas del departamento de geodinámica, 4ª planta Facultad de Ciencias Geológicas, Universidad Complutense de Madrid, Ciudad Universitaria

Irrigated agriculture produces 40 percent of the global food supply. In many irrigated regions throughout the world - Southwestern U.S., China, India, the Mediterranean region, Mexico - groundwater constitutes from one third to more than two thirds of all irrigation water. More importantly, groundwater provides a stable source of water against local and global climate variability. Groundwater overdraft and groundwater quality degradation in agricultural regions have become issues around the globe, and are now closely linked to global long-term food security in both irrigated and rain-fed regions. California provides an important microcosm of the diversity of challenges faced in global agricultural groundwater resources management and protection. Within California agriculture, the San Joaquin Valley dairy industry is among the agricultural sectors with the spatially most extensive groundwater interface. Through our research work, we have explored numerous aspects of this particular interface and show significant global implications. Our work includes the development of a systematic approach to define dairy farming operations as a nonpoint pollutant source, development of appropriate monitoring networks for an assessment of salt and nitrate fluxes from these nonpoint sources to groundwater, measurement of the occurrence and (subsurface) fate of pharmaceuticals, pathogens, and steroid hormones from animal farming facilities, and monitoring and modeling of nonpoint source contaminants in the unsaturated zone and groundwater at multiple scales, including deterministic and stochastic modeling approaches. Salt and nitrate pollution pose the most prevalent groundwater quality threat from dairies. Groundwater impacts are closely related to nutrient management in animal manure treated forage fields, which make up nearly 90% of the dairy landscape. Steroid hormones, pathogens, and pharmaceuticals in shallow, first encountered groundwater are mostly associated with leaking manure storage lagoons and subject to significant attenuation. These were not found in drinking water wells. We are currently developing a basin scale modeling approach to assess impact to domestic wells and large agricultural and municipal production wells from nonpoint source pollution in the San Joaquin Valley and elsewhere. It appears that a typical retention time of groundwater salt and nitrate arriving in domestic wells is on the order of a few decades, whereas large production wells pump a mix of water with some fraction less than half a century old and much of the water significantly older, indicating that current nitrate pollution levels only partially reflect the intensification of agriculture over the past 60 years. Our work has important implications for regulatory source control, drinking water policy, and provides some foresight into a globally recalcitrant groundwater contamination issue.