PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
ESCUELA DE INGENIERÍA
DEPARTAMENTO DE INGENIERÍA HIDRÁULICA Y AMBIENTAL

Invitación Seminario N°07/2017

A modeling tool to support decision making in future hydropower development in Chile

Sebastián Vicuña Diaz

Profesor Asociado, Departamento de Ingeniería Hidráulica y Ambiental
Pontificia Universidad Católica de Chile

Miércoles 26 de Abril de 2017, 13:00

Sala de Magíster, Campus San Joaquín, Vicuña Mackenna 4860

Modeling tools support planning by providing a transparent means to assess the outcome of natural resources management alternatives in the presence of conflicting objectives and within technical frameworks. Such tools, when employed to model different scenarios, complement discussion in a policy-making context. Examples of practical use of this type of tools exist, such as the Canadian experience with managing public forests, but are limited especially in the context of developing countries. Here, we present a tool to support the siting decision process for future hydropower development in Chile. This tool, developed by a large team of researchers with guidance from the Chilean Energy Ministry, is especially relevant in the context of evident regionalism, skepticism and change in societal values in a country that has achieved a sustained growth alongside increased demands from society. The tool operates at a scale of a river reach (between 1-5 km long) on a domain that can vary from river basins to regions, addressing both available hydropower potential and the existence (inferred or observed) of other ecological, social, cultural and productive characteristics of the territory valuable to society. The occurrence of each of these other valuable characteristics in the territory is measured generating a presence-density score for each of them. Recognizing the level of constraint each characteristic imposes on hydropower development, they are weighted against each other so that an aggregate score is computed. With this information, optimal trade-offs between additional hydropower capacity and valuable local characteristics are computed over the entire domain using the classical knapsack 0-1 optimization algorithm. Various scenarios of different weightings and hydropower development targets are tested and compared. The results illustrate the capabilities of the tool to inform hydropower development strategies and public policy discussions aimed at establishing incentives and regulations.

Profesor Encargado: Mario Vera, maverav@uc.cl , teléfono (+56-2) 23544227