

International Conference on

## NATURAL HAZARDS AND DISASTER MANAGEMENT

June 01-03, 2017 Osaka, Japan

**Multi-modeling approach for risk analysis in integrated security management using satellite observations****Yuriy V Kostyuchenko**

CASRE-National Academy of Sciences, Ukraine

Idea of multi-modeling approach is the search and analysis of common variables of different models as indicators for remote sensing, which is used as integrated variable for decision making and risk assessment models. Key tasks of the study include: Climate change on local scale control and forecasting: improvement of reanalysis models, adaptation of global models to local scale through rescaling and downscaling procedures, agrarian productivity risks and robust strategy development; Productivity of crops and ecosystems: carbon balance modeling, GHG emission and atmospheric concentration control, bioproductivity control, risk and uncertainties analysis; Water resources vulnerability assessment: risk of water quality degradation towards point and diffuse sources (agricultural and industrial) in view of air-soils-water pollution dynamics; Assessment of population vulnerability toward multi-disaster risks: population dynamic control, decision making under uncertainty and risk. Therefore all important aspects of food-water-energy security are described. Key approaches are applied to study: Stochastic modeling of multi-component systems; robust rescaling methods for integrated water, food, and energy security management under systemic risks and uncertainty; stochastic modeling of regional carbon cycle calibrated on satellite controlled GHG concentrations; stochastic and probabilistic assessments of crops productivity using satellite data; fuzzy modeling for water quality risk assessment basing on data of satellite observation, field measurement and modeling of separate parameters of water quality; stochastic modeling of population distribution with agro-ecological, market and infrastructure parameters, using land-use and land cover data from satellite. These approaches allow obtaining the sets of parameters describing a state of security which is a base for robust socio-economic and socio-ecological decisions.

Yuriv.v.kostyuchenko@gmail.com