

## Red Latinoamericana de Centros de Conocimiento en Gestión de Recursos hídricos

# RALCEA Capacity Building

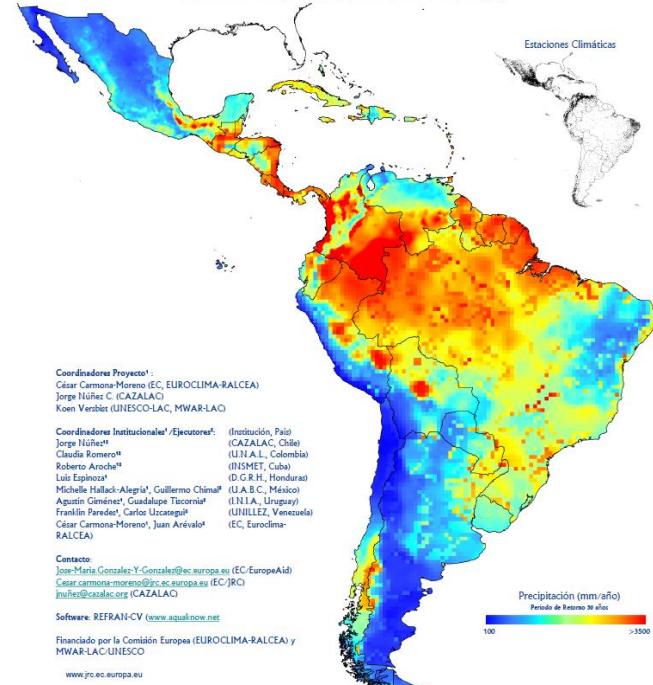
## Latino América para Latino América



*César Carmona Moreno  
Water Resources Unit  
Joint research Centre, Italy*

### VARIABILIDAD DE LA PRECIPITACIÓN ANUAL Contribución al Análisis Regional del Cambio Climático

Paises Piloto: México, Colombia, Venezuela, Chile, Cuba, Uruguay



# RALCEA Project

- RALCEA network aims at improving and sharing knowledge in the water sector in Latin America by stimulating policy and scientific dialogue.
- Thematic project in line with the EU Water Initiative (EUWI) and the regional program EUROCLIMA (Quinta Cumbre de EU-LAC, Declaración de Lima, 2008).
- RALCEA Project is a regional Project (18 countries) funded by the EC Pilot Programme for Latin America (2010-2015) – DEVCO.G2



## Objective

Alleviate poverty and reinforce intergovernmental cooperation through governance improvement in the water sector at regional and continental levels.

### Specific Objectives

- a) Foster **public policy making** based on scientific and technical knowledge,
- b) Promote south-south cooperation and **capacity development** in the water sector by supporting the development of a network of knowledge centres.



## Thematic Working groups – activities 2010-2015



### Water Quality and Sanitation

Coordination team:  
CE: FCH  
FP: México, Bolivia

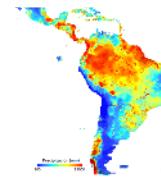
- Topics:
  - *Wastewater treatment and reuse*
  - *Indicators and tools for water resources quality/ecological state management*
  - *Water, health, and Environment links*



### Stakeholder Mapping and Capacity Building

Coordination team:  
CE: FICH-UNL  
FP: Chile, México

- Topics:
  - *Participation, conflict management and governance*
  - *IWRM and River basin management*
  - *Capacity building reinforcement tools*



### Regional Water Balance

Coordination team:  
CE: CAZALAC  
FP: Honduras

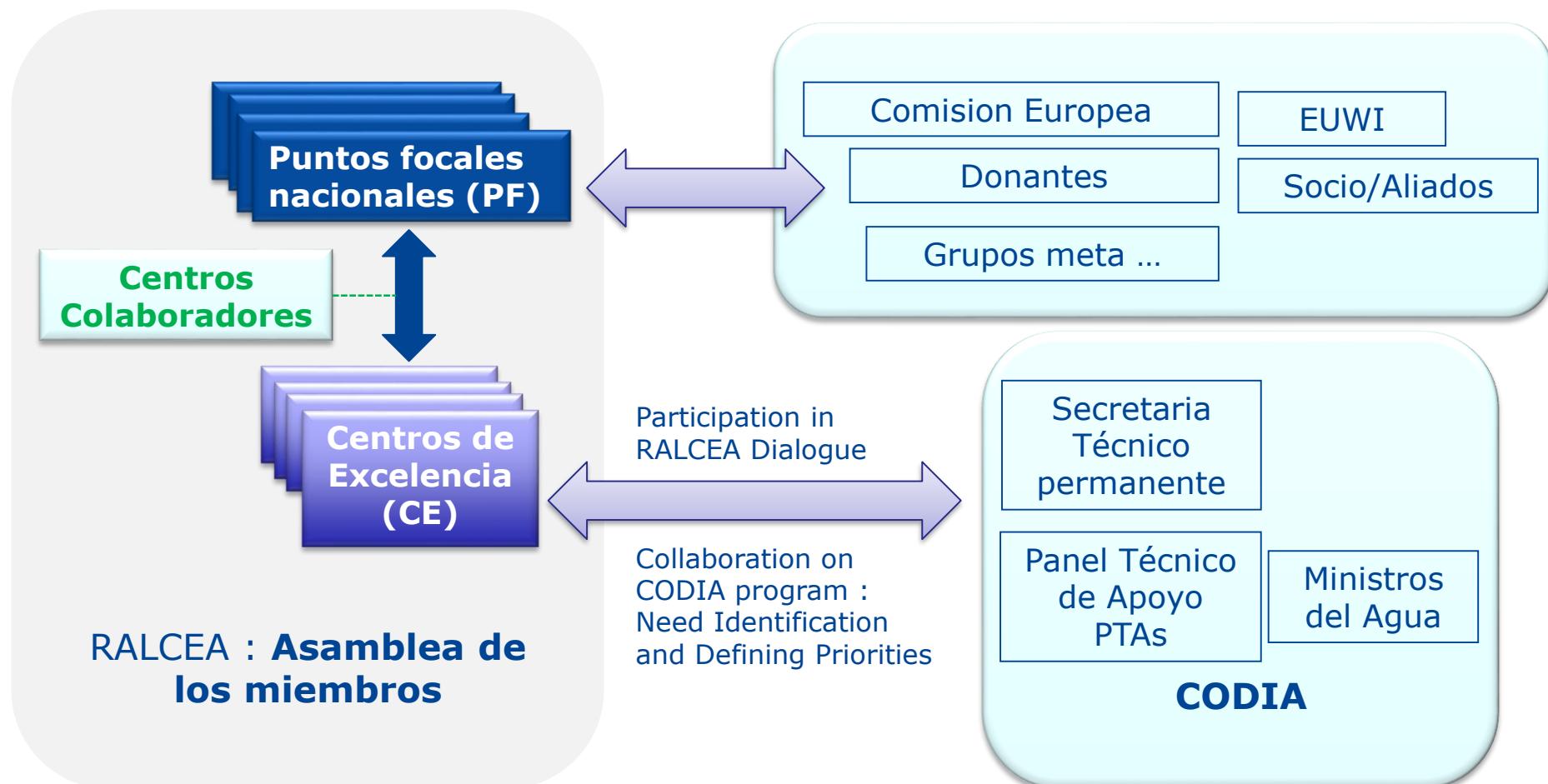
- Topics:
  - *Data and methods on variability of climate variables*
  - *Droughts, floods and extreme events return periods.*
  - *Short and mid term climate variability scenarios for river basin management*

ACTIVE REGIONAL COLLABORATION BETWEEN GOVERNMENTS and CENTERS OF EXCELLENCE

# RALCEA Network

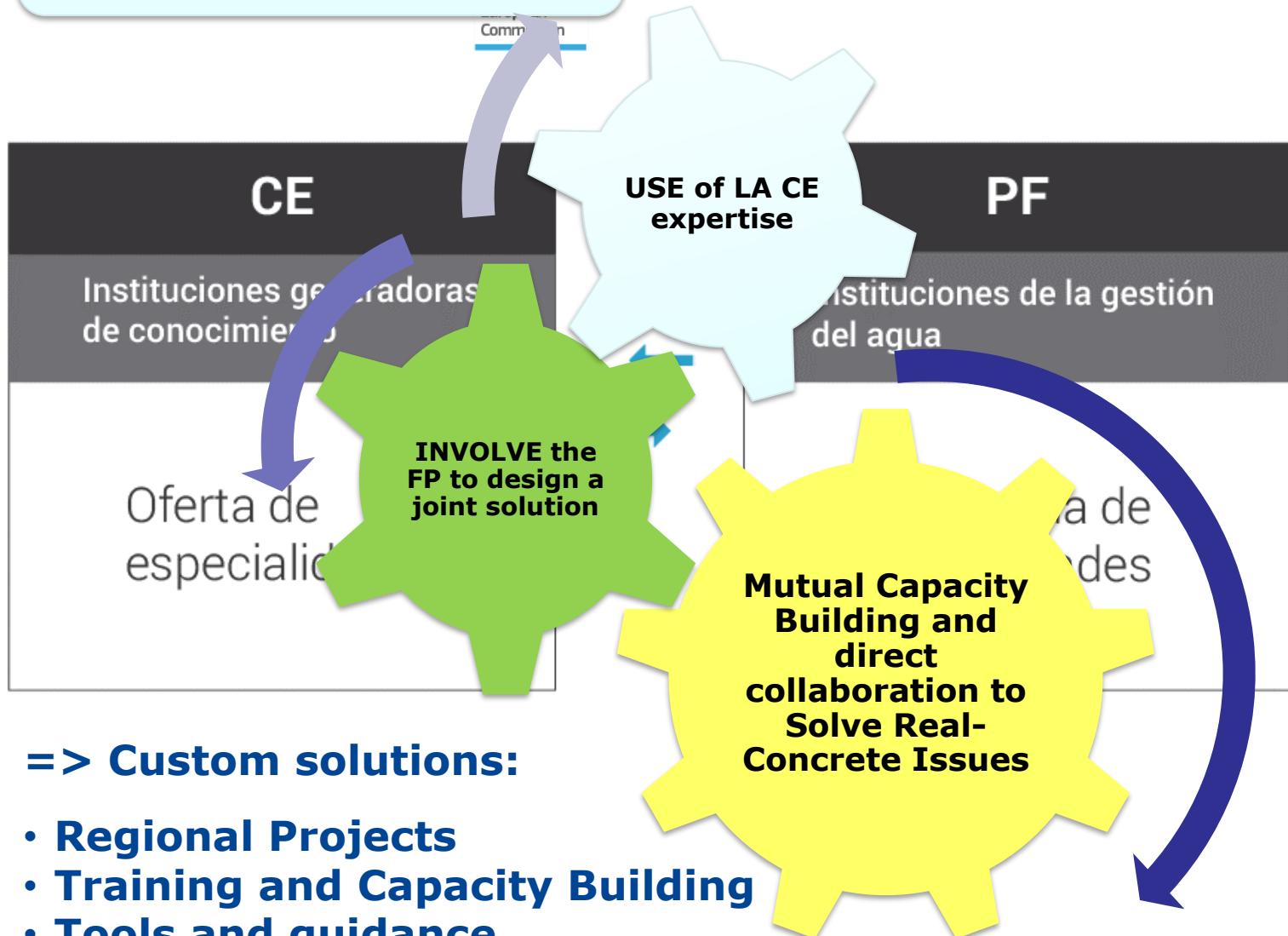


# Regional Integration



# KEY ELEMENTS of RALCEA mechanism

## ON-DEMAND DESIGN





# RALCEA main products (2010-2015)

## METHODS and TOOLS

- **Methods and guidance** on IWRM, Water Quality, Sanitation, Water Balance Variability (L-moments, medium term climate scenarios) with the publication of several guides (Guides and Tutorials)
- **Software/online tools:** REFRAN-CV software, Water Project Toolkit Application, Aquaknow online modules (GIS and self assessment), Aquasurvey software.

## CASES STUDIES and RIVER BASIN PILOTS in LA

- **Cases studies on the implementation of IWRM and Stakeholders Participation** in Latin America: "Mapeo de actores y desarrollo de capacidades para la gestión del agua Casos de estudio en Latinoamérica" (published in March 2015)
- **Cases studies on Water quality, treatment and sanitation** Sustainable Water Resources Management Initiatives in Latin America: A RALCEA guide of case studies ( English and Spanish versions – published in 2013)
- **River basin pilots** (Peru, Bolivia, Chile, Colombia, Costa Rica, Honduras and Argentina) where has been implemented methods to develop Medium Term Scenarios of Climate Variability ( 2014-2015)

## PROPOSALS OF REGIONAL PROJECTS

- **Identification and development** of projects proposals:
- **Ongoing projects** : **BASAL** (in Cuba) and **Aguas Subterraneas** (in Costa Rica), **Huella Hidrica** (leader Chile)
- 3 Regional Proposals on **Water Quality** : 1) **OCLA** (Basin Obs.); 2) **INDICA** (IWRM Indicators); 3) **YPACARAI** (Eutrophication)
- 1 Regional Proposal **Water Balance: Water-Energy-Agriculture Nexus Solutions in Central America for Climate Change Resilience**

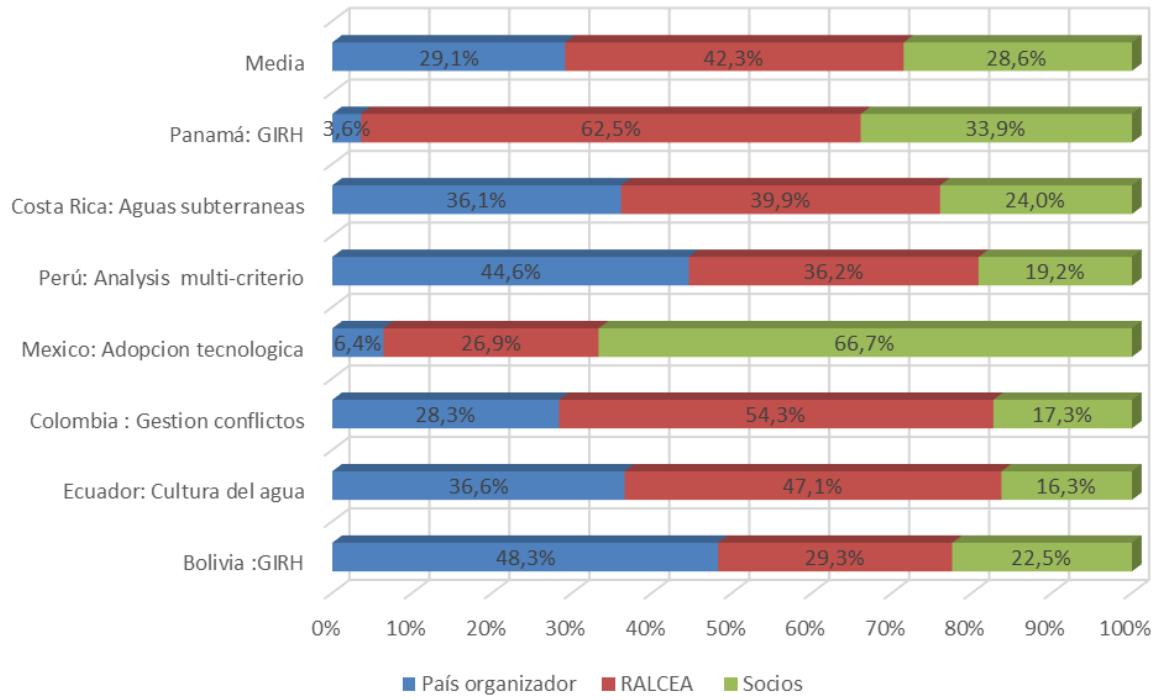
## REGIONAL CAPACITY BUILDING STRATEGY - TRAINING SESSIONS

- **Capacity Building – CODIA Regional Strategy (Programa Inter-American de Formacion)**: 16 trainings in 2010-2014 (**900 professionals**), 8 courses/workshops in 2015 (around **200 professionals**) and 7 proposals identified for 2016 in the frame of CODIA.

# RALCEA Co-financing

- Strong commitment of LA countries
- Involvement of international partners IAI, UNESCO-PHI, WMO, AECID, CODIA, ...

CURSOS Eje MAPEO DE ACTORES: Aporte en % por donantes



## PRODUCTS delivered

1. Publication of 29 cases studies in LA related to Water quality and Sanitation

⇒ Best practices or innovative approaches ( Spanish and English versions -2013)

2. Technical Assistance **and** Capacity building sessions:

- ⇒ In **Bolivia** on 2 treatment plants: SAGUAPAG and La Guardia that included diagnostic, information and discussion on solutions and evaluation of alternative options.
- ⇒ In **Guatemala** for Amatitlán lake with the water quality that included diagnostic and definition of coordination options in terms of water quality and health monitoring.
- ⇒ In **Panama** in the Río Venao in urban area, diagnostic and capacity building on bio-indicators, low-cost and integrated tools to monitor water quality.



A RALCEA Guide of Case Studies  
  
Guía de Casos de Estudio RALCEA



Lago Amatitlán Guatemala



Aplicación Bioindicadores

## RWB Coordination team:

*Centre of Excellence*

**CAZALAC**

*Focal Point*

**Honduras**



<http://www.climatedatalibrary.cl/CAZALAC/maproom/>

## **Products delivered**

- **1 regional map** of frequency of precipitation and **national maps** (21 countries)
- Database and analysis of return period of extreme events => essential for infrastructure design
- Application of L-moments methodologies to precipitations and temperatures in Bogota river basin (Colombia)
- Development of methodology of short/medium term climate scenarios on several river basins (Peru, Bolivia, Chile, Colombia, Costa Rica, Honduras and Argentina)



Accesible on-line en Español e Inglés



Data Library  
Maproom  
LAC Drought Atlas

Language  
english ▾

## LAC Drought Atlas

Historical drought frequency analysis for the countries of Latin America and the Caribbean.

This maproom shows the results of the Regional Frequency Analysis using L-Moments. The complete analysis is described in Nuñez et al. (2010).

The Drought Atlas was developed in collaboration with the International Center for Integrated Water Resource Management ([ICIWaRM](#)) and the European Joint Research Centre ([JRC](#)).

Regional workshops were organized with support from the Flanders-UNESCO Trust Fund ([FUST](#)) and in collaboration with the EU-funded projects [Euroclima](#) and [RALCEA](#).



### References

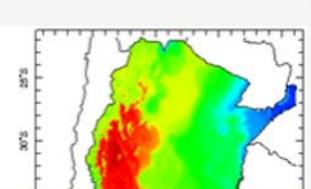
Nuñez, J.H., K. Verbist, J. Wallis, M. Schaeffer, L. Morales, and W.M. Cornelis. 2011. Regional frequency analysis for mapping drought events in north-central Chile. *J. Hydrol.* 405:352-366.

Maximum Expected Precipitation | Minimum Expected Precipitation | Historical Drought Frequencies

### Maximum Expected Precipitation

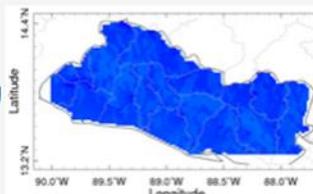
#### Argentina

This map shows the maximum precipitation amounts for multiple return periods for Argentina using a Regional Frequency Analysis using L-moments



#### El Salvador

This map shows the maximum precipitation amounts for multiple return periods for El Salvador using a Regional Frequency Analysis using L-moments (RFA-LM).



#### Guatemala

### Tres tipos de mapas disponibles:

Precipitación máxima esperada para diferentes períodos de retorno.

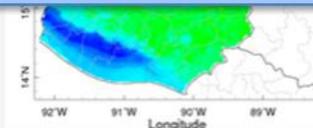
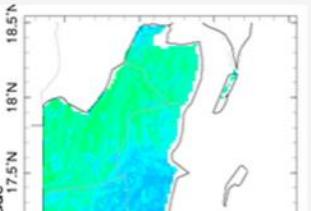
Precipitación mínima esperada para diferentes períodos de retorno.

Período de retorno asociado a diferentes intensidades de sequías.



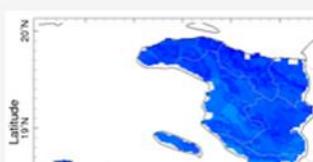
#### Belize

This map shows the maximum precipitation amounts for multiple return periods for Belize using a Regional Frequency Analysis using L-moments (RFA-LM).



#### Haiti

This map shows the maximum precipitation amounts for multiple return periods for Haiti using a Regional Frequency Analysis using L-moments.



## ***Tutorials and training sessions***

in collaboration with UNESCO-IHP, MWAR-LAC, EUROCLIMA project:

- 9 courses/workshops on the variability analysis and mapping of Precipitations at national and regional level (2010 to 2013)
- 2 workshops in 2014-2015 on climate change scenarios at river basin level

## **Around 100 professionals trained**

- 10 tutorials online for using REFRAN-CV software and L- Moments methodology



Workshop 11-13 March 2013 -Chile



Workshop 18-21 August 2015 -Colombia

# WG STAKEHOLDER MAPPING AND CAPACITY BUILDING (SMCB)



This SMCB WG focuses on delivered on-demand courses and technical assistance through regional collaboration

**Around 300 professionals trained  
2013-2014**

## Coordination team

*Centre of Excellence*

**Univ. Litoral**

*Focal Points*

**Chile, México**

País	Tema	CE/PF	Duración	Participantes
1. Perú	"Aplicación de la estructuración de problemas multi-criterio en cuencas pilotos del Perú"	UNICAMP (Brasil), CETA y FICH-UNL (Argentina) Agualimpia (Ecuador)	17-19 Mar. 2014	37 participantes
2. Costa Rica	"Estrategias para el Manejo, Monitoreo y Gestión de acuíferos en Costa Rica"	FICH-UNL (Argentina), CIH (Cuba), CICESE (Mexico) , Universidad Costa Rica (Costa Rica)	21-25 Abr.2014	20 participantes
3. Bolivia	"Curso Taller de Introducción a la Gestión Integral de los Recursos Hídricos"	FICH, UMSS	7-10 Oct.2013	47 participantes
4. Panamá	"Capacitación en mapeo de actores y GIRH"	UNICAMP(Brasil), CETA yFICH-UNAL (Argentina),	22-25 Abr.2014	34 participantes
5. México	"Taller de Intercambio de Experiencias Los retos de la adopción tecnológica en el sector hídrico en LA"	IMTA, CICESE (Mexico), IIED-AL (Argentina), Water for People (Peru y Bolivia)	3-5 Dic. 2013	54 participantes
6. Ecuador y Perú	"Formación de formadores en Cultura del Agua"	CONDESAN (Ecuador), AguaLimpia, IMTA (Mexico)	9-11 Oct. 2013	73 participantes
7. Colombia	"Aplicación de la estructuración de problemas en multi-criterio en cuencas piloto de Colombia. Planificación y Evaluación Estratégica para resolución de conflictos"	UNICAMP (Brazil), CETA (Argentina), Fundación Chile (Chile)	13-15 Nov. 2013	20 participantes

## Courses/workshops implemented in 2015 with CODIA

**Around 140 professionals  
trained in 2015**



País	Tema	CE/PF	Duración	Participantes
8. Cuba	Gestión integrada de Crecidas	CIH (Cuba), FICH-UNL (Argentina), INRH (Cuba)	27-31 Agosto 2015	25 participantes
9.Uruguay	Economía del Agua	FICH-UNL ( Argentina) y UNESCO-PHI	3-7 Agosto 2015	25 participantes
10.Colombia	Gestión integrada des aguas subterráneas	FICH-UNL ( Argentina), IAI, Costa Rica, Panamá	7- 11Septiembre 2015	32 participantes
11. Colombia	Intercambio de experiencias de consejos de cuencas Bolivia Perú, Colombia , México	FICH-UNL( Argentina), ministerios de Bolivia, Perú, Colombia, México	13-15 Oct 2015	30 participantes
12.Bolivia	Intercambio de Experiencias sobre la adopción tecnológica en el sector hídrico en LA	FICH-UNL( Argentina), CISESE (Mexico),	9-11 Nov 2015	30 participantes

## Publication of Cases Studies



Red de Centros de Excelencia en Agua en América Latina

Mapeo de actores y desarrollo de capacidades para la gestión del agua

Casos de estudio en Latinoamérica



2015



Coordinadores del Eje Temático Mapeo de Actores  
Facultad de Ingeniería y Ciencias Hídricas  
Universidad Nacional del Litoral, Santa Fe, Argentina



- Fortalecimiento de instituciones locales para la gestión integrada de los recursos hídricos de la cuenca



- Estrategias para el manejo, monitoreo y gestión de acuíferos



- Retos de la apropiación de tecnologías en el sector hídrico de Latinoamérica



- Mapeo de actores y gestión de cuencas hidrográficas



- Consejos de recursos hídricos de cuenca. La participación de los actores en la gestión del agua

## Tools/guidance developed



Red de Centros de Excelencia en Agua en América Latina

Herramientas para Contribuir a la Gestión Sustentable del Agua en Latinoamérica



2015

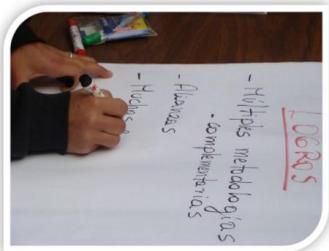
Coordinadores del Eje Temático Mapeo de Actores  
Facultad de Ingeniería y Ciencias Hídricas  
Universidad Nacional del Litoral, Santa Fe, Argentina  


- 1 • Conceptos introductorios a la Gestión Integrada de los Recursos Hídricos (GIRH)
- 2 • Aguas subterráneas. Estrategias para su gestión, manejo y monitoreo
- 3 • Actores claves en la gestión de una cuenca hidrográfica
- 4 • La Educación sobre el Agua en las Escuelas: Sentando las bases de una gestión sustentable e integrada del agua
- 5 • La Gestión de una Red de Desarrollo de Capacidades



Red de Centros de Excelencia en Agua en América Latina

Manual para el diseño, realización,  
evaluación y monitoreo de actividades  
de desarrollo de capacidades



2015



Coordinación del Eje Temático Mapeo de Actores  
Facultad de Ingeniería y Ciencias Hídricas  
Universidad Nacional del Litoral, Santa Fe, Argentina



Report EUR 27061 ES



- Conceptos a considerar cuando se planifica , diseña y realiza un curso, y lógica a seguir



- Ejemplo de planilla de control de tareas y procesos, útil y fácil a usar



- Formatos estandarizados como diplomas, encuestas de monitoreo...



- Sugerencias basadas en experiencias y lecciones aprendidas de RALCEA



## GESTIÓN INTEGRADA DE CRECIDAS

Guía y caso de estudio

2015

COORDINADORES DEL EJE TÉMATICO MAPEO  
DE ACTORES Y DESARROLLO DE CAPACIDADES  
UNIVERSIDAD NACIONAL DEL LITORAL,  
SANTA FE, ARGENTINA  
Carlos Ubaldi PAOLI, Celine DONDEYNÁZ, Casar  
CARMONA MORENO

Report EUR 27593 ES



- Tipología y descripciones de inundaciones
- El enfoque de la gestión integrada
- Formulación de medidas
- Formulación de planes de gestión
- Lineamientos sobre los aspectos de legislación
- Caso de estudio de Santa Fe Argentina

Courses/workshops to be implemented in 2016 with CODIA

**Around 200 professionals  
trained foreseen in 2016**



País	Tema	CE/PF	Duración	Participantes
1. XXXXX	Balance Hídrico Para Planificación Recursos Hídricos	RALCEA, CIH (Cuba), FICH-UNL (Argentina), UNESCO-PHI, AECID	1 week – Second Semester	25 participantes
2. México - Colombia	Intercambio Experiencias en Consejos de Cuencas	RALCEA, México, IAI, USAID – PARAGUA, AECID	1 semana – June 2016	25 participantes
3. Uruguay	Gestión integrada des aguas subterráneas	RALCEA, IAI, Costa Rica, Panamá, Cuba, Uruguay, AECID	1 week – Second Semester	32 participantes
4. Mix Virtual - XXXX	Gobernanza del AGUA en América Latina	RALCEA, AECID, ANA-BRASIL	1 week – Second Semester	30 participantes
5. Virtual	Instrumentos Económicos para Planificación	RALCEA, CISESE (México), UNESCO-PHI	1-2 weeks – Second Semester	30 participantes
6. Bolivia	Adopción Tecnologías para Saneamiento	RALCEA, SENASBA, IMTA	Second Semester	30 participantes
7. XXXX	Gestión Integrada de Crecidas	RALCEA, AECID, WMO	Second Semester	30 participantes



RALCEA outputs are online on AQUAKNOW.NET  
E-trainings and educational material are freely available



- **Regional Partners**

IAI



CODIA



AECID



BID



UNESCO-PHI



+ LA countries members of RALCEA **strong commitment**

# RALCEA – GOING AHEAD

Starting from PRIORITIES and NEEDS set by Focal Points/PTAs-CODIA (**BOTTOM – UP**):

## MAIN issues

- ***Climate variability***  
(Droughts/floods/Canicula/ENSO ...)

How to forecast and mitigate the impacts  
and ensuring:

- Efficient Food Production,
  - Efficient Hydro-Electricity
  - Adequate water supply for all
- ⇒ Sustainable development



- ***Water quality of fresh and ground waters*** where issues are:

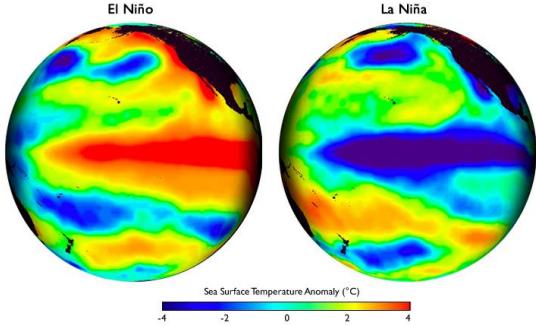
- Monitoring, Conflicts Management (WD)
- Governance, integrated water resources management

## Activities

## **REGIONAL PROJECTS**

**Needs for :** Monitoring  
and Assessment Systems,  
Decision Support  
Systems, Manual and  
guidance, Capacity  
Building, Dialogues, Data  
and Methodology  
Harmonisation, ...

**Needs for NEXUS :**  
**Integrating other  
Sectors – Agriculture /  
Energy**



## REGIONAL PROJECT PROPOSALS

### Regional Project : Water – Energy – Food NEXUS Solutions in Latin America for Climate Change Resilience.

**OBJETIVE:** Support the Latin-American countries to contribute to the socio-economic development of the region through efficient Water Resources, Food Production and Hydro-Energy management in a context of strong Climate Variability for Climate Change Resilience. This will be achieved by developing pilot experiences and engaging with key regional partners in Latin America (CODIA and WEF Stakeholders) to upscale these experiences to the regional level. **Extending RALCEA to other WEF NEXUS sectors.**

Latin America Countries + Cuba

Supported by **UNESCO- PHI, IDB (InterAmerican Development Bank), CODIA (LA Countries!), AECID (Spain), Portugal, IAI**



The 3 following projects proposals have been developed related to management of water resources in particular in terms of quality.

Name	description	Coordinators	Duration
<b>OCLA Observatorio de Cuenca</b>	<p>Pilot project in 5 river basins in Latin America that includes optimising the “observatorios de cuencas”, a mean to improve IWRM at that scale. This project includes:</p> <ul style="list-style-type: none"><li>a. Standardization of monitoring/sampling methods and data analysis, variables and protocols necessary to ensure a better decision making and participation of stakeholders</li><li>b. Setting up of Observatorio in representative 5 pilot river basins with a web information platform.</li><li>c. Define a sustainable model of the administration of an observatorio (governance, funding...etc)</li></ul>	<b>PF:</b> MEXICO <b>CE :</b> CICESE (México), FCH (Chile), UNAL (Colombia) México, Chile, Colombia y Guatemala	2 a 5 years
<b>YPACARAÍ Prevención y rehabilitación de cuerpos de agua eutróficos</b>	<p>Pilot Project on the Ypacaraí lake in Paraguay that includes:</p> <ul style="list-style-type: none"><li>a. Define a baseline study and design of conceptual model of eutrophication</li><li>b. Develop tools for the assessment of eutrophicated bodies (criteria/indicators/measuring methods), the evaluation and selection criteria of mitigation/rehabilitation measures and tool for selecting cost-effective mitigation measures for a better management</li><li>c. Application to Ypacaraí lake for testing and validation</li></ul>	<b>PF</b> Paraguay. <b>CE :</b> CASA-UMS (Bolivia), FCH (Chile), CETA-UBA (Argentina) Paraguay, Argentina, Bolivia y Chile, AECID is interested	2 a 5 years
<b>INDICA Definición de indicadores y metodologías para los recursos hídricos</b>	<p>This project foresees:</p> <ul style="list-style-type: none"><li>a. Definition of a baseline for LA to review indicators available for assessing IWRM.</li><li>b. Development of a set of standard indicators adapted for LA</li><li>c. Development of a tool for identifying vulnerable areas/hot spots, for monitoring and providing key information for an efficient water integrated management.</li><li>d. Application on several representative areas- pilots for validation of the methodological framework</li></ul>	<b>PF:</b> El Salvador <b>CE</b> UNAL-IDEAM (Colombia), IST-UTL (Portugal) Chile, Portugal, Panamá y Colombia	2 a 5 years



## RALCEA

**Ciencia y Tecnología al servicio de las necesidades gubernamentales  
en el Sector Hidrológico para América Latina**

**For more information:**

<http://www.aquaknow.net/ralcea-centros-de-excelencia-en-america-latina>

**Contact Coordination team:**

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