



Equipo DRR:
*Reducir Riesgos de Desastres
relacionados al agua*

Debriefing 16 March 2015

www.drrteam.nl/#drrteam



Equipo DRR - Uruguay

*Misión de Emergencia para
Inundaciones, Ciudad del Plata*

25 – 27 de febrero de 2015
www.drrteam.nl/#drrteam

Jan van Overeem &
Jana Steenbergen



"Holanda puede ofrecer al mundo una gran cantidad de conocimiento y experiencia en el área de gestión del agua. No puedo y no voy a esperar y ver como los efectos de las inundaciones, sequías, huracanes y tsunamis son cada vez mayores. Nobleza obliga, a lo que se refiere "

Ministro Schultz van Haegen
Vice Presidente del Alto Nivel de Expertos y Líderes del Grupo de Agua y Desastres (HLEP)

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febrero de 2015



Equipo DRR-Uruguay, misión de emergencia para inundaciones

- Setiembre 2012
Inundaciones causada por niveles altos del Río de la Plata (por vientos E-SE) junto con lluvias fuertes
- 7 - 9 Febrero de 2014
Lluvias intensas con un nivel medio del Río de la Plata.
Aumento fuerte de la capa freática.
Inundaciones en Montevideo, Ciudad del Plata Ciudad de la Costa
- 26 de diciembre de 2014
Inundación por lluvias localizadas e intensas en Montevideo y Ciudad del Plata



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DRR Emergency mission Uruguay – focus

- Emergency mission has geographical focus on Ciudad del Plata.
- Dike in a very bad shape.
- Not sufficient drainage capacity to discharge the urban waters.
- Local consultant will be hired to survey the dike and to make an assessment of emergency repair works.
- DRR-Team will support DINAGUA with requirements for this assessment and for integration in water management plan.
- Also preparation of scoping mission for master plan for urban water management.



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DRR mission Uruguay – urban water management strategy

- Uruguay has no national water plan but an action plan towards a national water plan (“Hacia un Plan Nacional de Gestión Integrada de Recursos Hídricos. Agenda para la Acción”).
- The intention is to produce the national plan on the basis of the information gathered in 3 pilot projects (Salto, Young and Ciudad del Plata)
- The actual strategy is “Vivir con el Agua” (displace inhabitants and goods from areas at risk permanently or pro-active)
- It is expected that this strategy will not change (expensive, maintenance)
- Note that Urban areas are usually not protected by dikes, except Ciudad del Plata.




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Equipo DRR-Uruguay, misión de emergencia para inundaciones

- Situation at Ciudad del Plata is complicated, because of dike to protect against flooding by Río Santa Lucía and Río de La Plata.
- That is reason why DINAGUA asked assistance of DRR-Team with assessment of local consultant.
- Besides, DINAGUA is preparing ToR for IADB project for Urban Water Management Plan for Ciudad del Plata. Also for this assessment DINAGUA asks for Dutch technical support.



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DRR – Team Uruguay

Debriefing



Juan Manuel Albisetti



Jan van Overeem



Jana Steenbergen

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Montevideo- Ciudad del Plata 24- 27 Febrero 2015

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28 februari, 2015

Agenda

Miércoles 25 de febrero		
hora	Actividad	lugar
9.00-10.30	Intercambio de consultores con autoridades del SINAIE, MVOTMA, MRREE, Intendencia de San José. Presentación de la Misión	SALON DE ACTOS del MVOTMA Zabala esq. 25 de Mayo (subsuelo)
11.00-12.30	Reunión de intercambio con equipo técnico interinstitucional de Ciudad del Plata: presentación de la zona y principales problemas.	
13.00-14.00	Almuerzo consultores, SINAIE, DINAGUA, Alcaldía Ciudad del Plata e Intendencia de San José	
14.00-17.00	Visita a Ciudad del Plata- Reconocimiento de la zona e intercambio con Alcalde y actores locales	Ciudad del Plata
Jueves 26 de febrero		
9.00-10.00	Intercambio sobre situación del drenaje urbano en el Uruguay (DINAGUA, Consultores)	SINAIE-
10.00-12.00	Intercambio por tema específico de la consultoría seleccionada para analizar la estabilidad del Dique de Delta del Tigre	Edificio Torre Ejecutiva Liniers 1324 piso 9
14.00-17.00	Aguas pluviales urbanas: la experiencia de planificación y proyecto en Netherland- a cargo de Jan van Overeem - Arcadis, Universidad de Delft, UNESCO-IHE Jana Steenbergen - Jefa del equipo Costas & Ríos de la consultora Grontmij en Holanda Intercambio con técnicos locales-	Presidencia de la República Edificio Torre Ejecutiva Liniers 1324 Subsuelo
Viernes 27 de febrero		
	Jornada de trabajo a definir conjuntamente	DINAGUA
	Espacio para definición de agenda futura	





Primeras observaciones del dique y la zona Playa Pascual



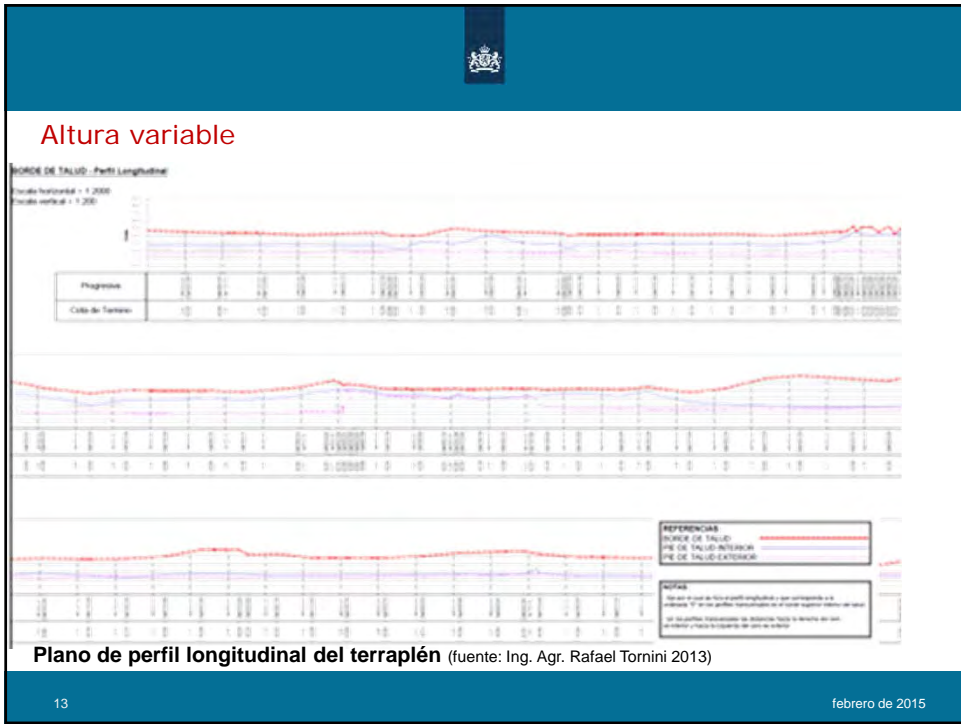
11 febrero de 2015



El Dique alrededor del Delta del Tigre

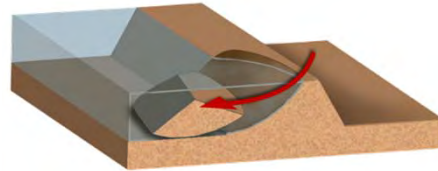


12 febrero de 2015





Falla de falda exterior- lugar débil

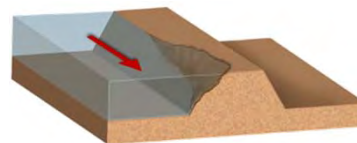


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febrero de 2015



Erosión de puntera del dique- lugar débil



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febrero de 2015



Madriguera de los animales – daños al dique



Tucu-tucu
2015





hormigas



17febrero de 2015



Vegetación al dique- debilidad y fuerza





a b



Monday, 25 Feb 2019



18febrero de 2015



Otras debilidades del dique



19febrero de 2015



Embotellamientos a nivel del sistema



Válvula Anti-retorno embotella descarga del agua pluvial durante aguas altas en el río

Erosión caprichosa de la zona costal – daños a las dunas

20febrero de 2015



International Levee Handbook Climate App



<http://www.climateapp.nl/>

The International Levee Handbook








<http://www.ciria.org/default.aspx>

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Algunas soluciones de urgencia

Determinar el nivel de la protección contra inundaciones fluviales (altura del dique):
 Comparar los gastos para evacuación y recuperación en la zona inundada con los gastos para mejorar el dique y medidas contra inundaciones pluviales

Físicas

- Aumentar el nivel del dique en las zonas más bajas.
- Corregir inclinación de los taludes (al lado del río con mínimo 1:3 y al lado del barrio 1:2).
- Quitar los árboles y vegetación grande al talud exterior y interior y cortar la pasta.
- Proteger el talud externo (al mínimo la puntera) contra la erosión (las rocas o geotextil)
- Desalentar las madrigueras en el dique y las excavaciones por la gente.
- Instalar bomba(s)
- Barrera temporal para la zona de carretera

Institucional

- Aumentar conocimiento de la función del dique entre los habitantes del Delta del Tigris (estudiantes, vecinos, la gente de intendencia quien hace mantenimiento)

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Dentadura



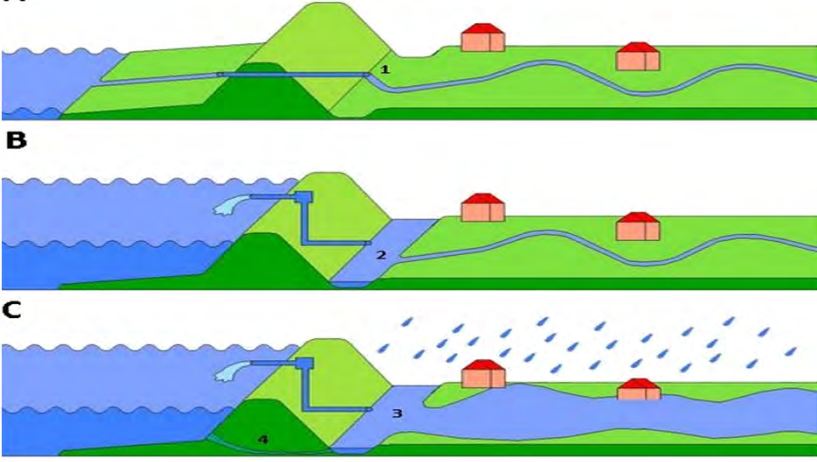
Estructura típica del dique

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Mantenimiento del dique

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The diagram illustrates the process of pumping rainwater in three stages:

- A:** Shows a cross-section of a landscape with a hill and two houses. A pipe labeled '1' is shown tapping into the ground near the hill, representing the initial collection point.
- B:** Shows a pump system installed. A pipe labeled '2' leads from the collection point to a pump, which then discharges water into a larger pipe labeled '3' that runs through the houses.
- C:** Shows rain falling on the landscape. The pump system is active, with water being collected and pumped into the main distribution pipe labeled '4'.

Bombeo de las aguas pluviales

25 febrero de 2015

DRR-Uruguay – Scoping mission

- DINAGUA is in contact with IADB for Urban Water management Plan for Ciudad del Plata.
- This “Ante-proyecto” includes strategy plan, operational plan and basic design of long term measures.
- Study financed by IADB with funds originating from European LAIF program (sanitation and climate adaptation) managed by AECID.
- ToR must be ready by 1st of July 2015. IADB charmed by Dutch approach for New Orleans.
- DINAGUA requires support for drafting ToR.
- Dutch companies should not contribute to ToR via the DRR team.
- Possible if an independent Dutch expert (for example Arnoud Molenaar, Rotterdam) supports with ToR?
- Besides focus of scoping mission on more general themes, closely related to the national water plan.

26 febrero de 2015



DRR-Uruguay – Scoping mission

Following themes were suggested by DINAGUA

1. Risk mapping - evaluation of their approach with combined probability of water levels river sea and rainfall. Assessment of damage and low cost, short term and long term measures.
2. Urban water modeling - possibilities for modelling drainage and sewage system in integral way.
3. Transfer of Technology - Dutch practical approach in design and maintenance of measures for urban water.
4. Monitoring - Remote Sensing data from Satellite and Radar.
5. Drainage into sea - Dutch experience with design a proper outflow of the drainage system into the sea.

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DRR-Uruguay – Scoping mission

Further focus of scoping mission

- Meetings with IADB, WB and EC on other donor programs for possible financing of identified aspects.
- Stock taking meeting with interested Dutch companies on strategy and investment climate.
- One-week scoping mission to take place in first half of May 2015.
- Required expertise:
 - Team leader with expertise in flood / urban water management
 - Technical expert on urban water management
 - Technical expert on drainage systems
 - Technical expert on risk mapping
 - Technical expert on mathematical modelling

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Mission information provided to DRR-team

- Good information about water system Uruguay.
- Report was not clear / transparent due to limited time.
- Need for short sheet presentation with core message.


Core message of information set:

- Optical satellite imagery is available but we can only identify flooded areas if there is NO cloud cover, which is rarely the case during floods. This did not happen with Ciudad del Plata.
- Radar data is therefore required but there is no radar data recorded in Uruguay during flood events.
- Radar satellite providers should be made aware of areas of interest in Uruguay beforehand. Dutch could assist in this.


Nevertheless, DINAGUA became interested to work on this.

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MISSION INFORMATION URUGUAY



DSS water en DRR-team:
Van noodhulp tot het voorkomen van watergerelateerde rampen en hulp bij wederopbouw.

25 februari 2015

30 febrero de 2015



General Geography of Uruguay

- Area of Uruguay is 176,000 km²
- Uruguay has a population of 3.25 million inhabitants
- Topography is transition between Argentine plains in west to hilly lands of southern Brazil
- Flat plains are found along eastern, southern, and western borders
- Interior consists of rolling plains and hills
- Highest point is Cerro Catedral (514 m)



Uruguay relief map, showing the country's plains, hills, lakes and rivers.

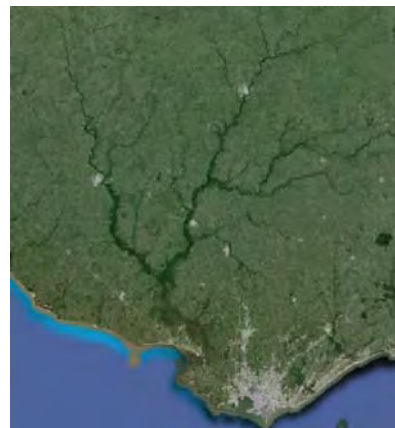
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General Geography of Uruguay

- Atlantic coast is sandy with number of shallow lagoon inlets
- Coasts of Rio de la Plata and the Rio Uruguay are less wet and broader.
- The largest lake is formed by a dam in the Río Negro. It is the largest artificial lake in South America.




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General Geography of Uruguay

- Ciudad del Plata is east of Montevideo in delta of Rio Santa Lucia.
- Flooding occurs with heavy rainfall causing peaks in river level, especially in combination with winds from southern directions
- Dike around city is not able to withstand extremes. Height differences near Ciudad del Plata varies from 0 near coast to 50 m on landward ridges.




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Satellite information before and after flooding

- 7-9 February 2014: only few images without clouds and no radar images. Radar images would be necessary as it penetrates through clouds.

Acquisition	Satellite	CC	Angle	Quicklook	Select	Info
2014-02-28	Landsat-7	72	0	Quicklook	<input type="checkbox"/>	Info
2014-02-27	Landsat-8	61	0	Quicklook	<input type="checkbox"/>	Info
2014-02-26	GeoEye-1	27	26	Quicklook	<input type="checkbox"/>	Info
2014-02-26	GeoEye-1	40	14	Quicklook	<input checked="" type="checkbox"/>	Info
2014-02-26	GeoEye-1	29	14	Quicklook	<input type="checkbox"/>	Info
2014-02-19	Landsat-7	87	0	Quicklook	<input type="checkbox"/>	Info
2014-02-15	GeoEye-1	21	23	Quicklook	<input type="checkbox"/>	Info
2014-02-12	Landsat-7	28	0	Quicklook	<input type="checkbox"/>	Info
2014-02-03	Landsat-7	62	0	Quicklook	<input type="checkbox"/>	Info
2014-02-01	QuickBird-2	100	27	Quicklook	<input type="checkbox"/>	Info
2014-01-27	Landsat-7	98	0	Quicklook	<input type="checkbox"/>	Info
2014-01-26	Landsat-8	9	0	Quicklook	<input type="checkbox"/>	Info
2014-01-22	QuickBird-2	0	28	Quicklook	<input type="checkbox"/>	Info
2014-01-20	Kompsat-2	9	-4.3	Quicklook	<input type="checkbox"/>	Info
2014-01-20	Kompsat-2	9	-4.3	Quicklook	<input type="checkbox"/>	Info
2014-01-20	Kompsat-2	9	-4.3	Quicklook	<input type="checkbox"/>	Info
2014-01-20	Kompsat-2	9	-4.3	Quicklook	<input type="checkbox"/>	Info
2014-01-19	Landsat-8	16	0	Quicklook	<input type="checkbox"/>	Info
2014-01-18	Landsat-7	0	0	Quicklook	<input type="checkbox"/>	Info




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Satellite information before and after flooding


- Floods of July 2014: much images are available at Bella Union



12 June (before)




8 July (during)



18 July 2014 (after)


- Impact of the flooding can still be detected (darkish areas)

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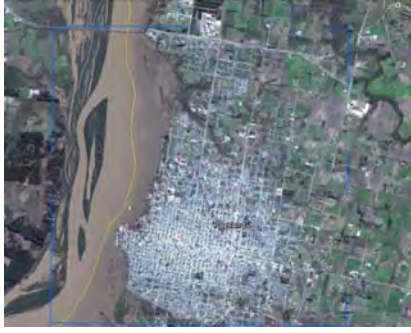


Satellite information before and after flooding

- July 2014: much images are available at Paysandú




23 March 2014 (non flooded)





19 July 2014 (flooded)

36 febrero de 2015




Available information from satellites wrt events (before and after flooding)

- Paysandu Area
- 23rd March (left image: non flooded situation) and 19th July (right image; flooded)

37 febrero de 2015




Satellite information before and after flooding

26 December 2014:

- For the period around this date a number of satellite images are available but only before flooding.

Acquisition	Satellite	CC	Angle	Quicklook	Select	Info
2015-01-14	Landsat-7	93	0	Quicklook	<input type="checkbox"/>	Info
2015-01-11	Landsat-8	2	0	Quicklook	<input type="checkbox"/>	Info
2015-01-06	Landsat-8	37	0	Quicklook	<input type="checkbox"/>	Info
2015-01-05	Spot-5	0	-29.4	Quicklook	<input type="checkbox"/>	Info
2015-01-05	Landsat-7	0	0	Quicklook	<input type="checkbox"/>	Info
2015-01-01	Kompeat-2	9	-1.2	Quicklook	<input type="checkbox"/>	Info
2015-01-01	Kompeat-2	9	-1.2	Quicklook	<input type="checkbox"/>	Info
2014-12-29	Landsat-7	11	0	Quicklook	<input type="checkbox"/>	Info
2014-12-28	Landsat-8	22	0	Quicklook	<input type="checkbox"/>	Info
2014-12-22	WorldView-3	93	30	Quicklook	<input type="checkbox"/>	Info
2014-12-22	WorldView-3	100	21	Quicklook	<input type="checkbox"/>	Info
2014-12-21	Landsat-8	91	0	Quicklook	<input type="checkbox"/>	Info
2014-12-20	Landsat-7	33	0	Quicklook	<input type="checkbox"/>	Info
2014-12-13	Landsat-7	16	0	Quicklook	<input type="checkbox"/>	Info
2014-12-12	Landsat-8	56	0	Quicklook	<input type="checkbox"/>	Info
2014-12-08	TerraSAR-X	0	39.2	None	<input checked="" type="checkbox"/>	Info
2014-12-05	Landsat-8	1	0	Quicklook	<input type="checkbox"/>	Info
2014-12-04	Spot-6	0	16.7	Quicklook	<input type="checkbox"/>	Info
2014-12-04	Landsat-7	0	0	Quicklook	<input type="checkbox"/>	Info

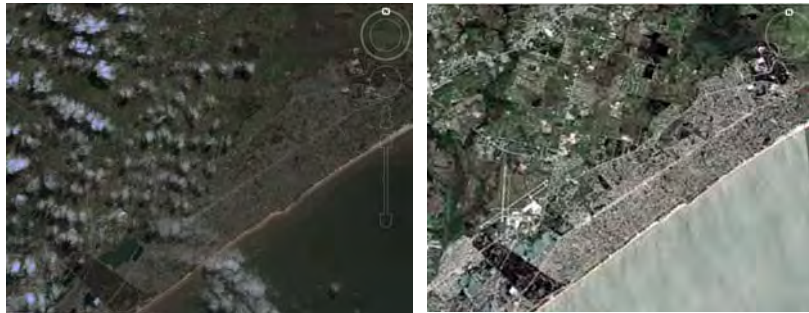


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Satellite information before and after flooding

- 19 September 2012
- Satellite images are available but useless due to 100% cloud cover.
- Two images before (10 Sep 2012) and after (23 Sep 2012) are available for Ciudad Costa Oro



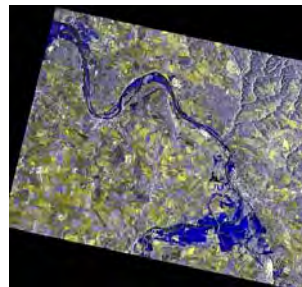
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Findings

- Enough optical satellite imagery is available in period of event and each location which .
- This can help identifying flooded area only if there is NO cloud. This is rarely the case during floods.
- Therefore radar data is required.
- Problem is that in Uruguay no radar data has been recorded during flood events while radar has the ability to 'see' through clouds.
- This can be prioritized by make radar satellite providers aware of hotspots and areas of interest in Uruguay beforehand.
- Dutch could assist in this.
- These data is very useful for hydrological modeling



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