GIS Solution to Enviromental Management, monitoring & Risk Analysis

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Summary

The oil Spill occurred in Peru on the 15th of January, when an abnormal movement of the Italian tanker Mare Doricum, while unloading crude oil at the Multi.bouy Terminal #2 (La Pampilla Refinery), broke the underwater infrastructure at the terminal (Pipeline end Manifold) and initiated the oil spill, impacting the natural environment, as well as the population and the wildlife along Peruvian coastline.

Having analyzed the tecnical information available, the company estimates thet the oil spilled amounted to approximately 10.300 barrels, that is being recovered through intensive work to clean up the sea and the affected beaches.

Summary

REPSOL confirms its commitment to continue Mitigating and remedying the effects of this spill,

Working together with the Peruvian authorities and affected communities to respond to their needs in the most effective way and with total transparency.

Summary

The GIS solutions available at REPSOL allow monitoring, outomating and improving the desition.,aking process in the crisis room (Real.time).

A multi-talent team was established (HSE, ExCe & Downstream) in order to provide all the experience in different fields to optimaze time and defien strategies.

Summary

Land

Removing the affected sand with manual labor, carried out by property trained personnel with the necessary perdolal preotective equipment

Ocean

Working with skinners, highly efficient marine cleaning machines, affected áreas were throughly cleaned

Summary

Air

Using satellite technology and mantaining constant aereal monitoring with helicopters and drones to identify posible new affected areas and develop the necessary contingency actions to address and resolve the problem

Land

We count on the specialized service of experts and are in constant coordination with staye agencies for the immediate protection of the affected wildlefe

Benefits

- ***Data Driven decisión making***
- *Immediate data availability (First data set were available for users in 3 days!)* ***80%*** *of time reduction.*
- *No reformat or manual standardization needed. Everyone input* ***Standard data***
- Report for government and authorities reduce ***90%*** preparation time.
- Following advances and defining a strategy with real time data.

Benefits

- ***Optimize resources***. Where and web people or equipment should be in place. Data accessibility ***24X7***

- Accomplish deadlines to avoid future sanction due to routines automatizations

- ***One*** repository – **Multiple** users and sources

Requirements

- Create worflow to capture data.(speed uo process,
- Create to aceess daye to take desition on strategy,
- Data Standards & integraton
- Report genetatio Mintoring resourdes.team.impatcs localions in field.
- Interactive map to Access and consume data in creisi room.

How we did it?

- **Different teams** working together to ***propose ideas, alternatives and solutios*** to cover final user needs, Afert too imprmetation, user ***commitmetn***t further added to the enrichmeny of these tools.
  Full support from both IT:GIS and to make a Upper management quick transition.
  Cuantomizable tools availbale 24 X 7

Cons

- User **lack** of knowlegde of GIS technoloides
- Limiutes ise of GIW ***tools available*** in home.
- No requeriemnys Y **standards for contracts**,
- **100’%** manual process (Report Y data gatjering)
- Non integrated data

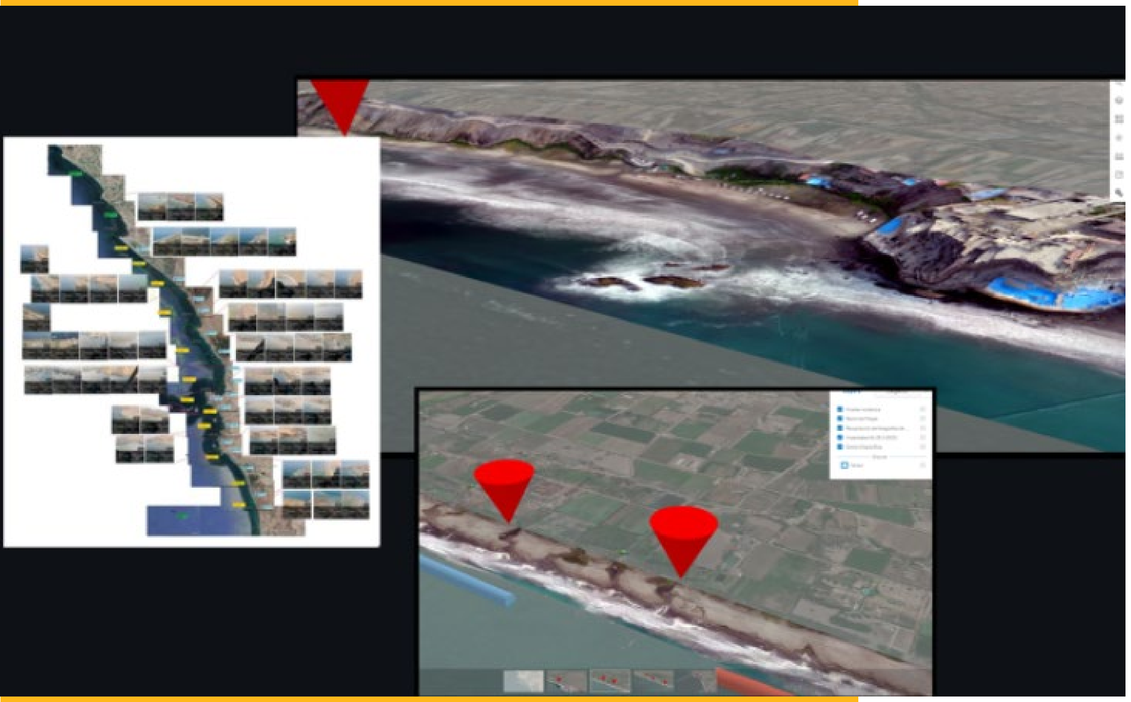
Why GIS a technologies?

- Real time ***monitoring***
- Offline/online Data capture
- Routines & workflows
- Multi sourced Visuliaztion & Integration (***Including IA***)
- Platform reay to use & customizable
- No GIS tools experience needed ***(GIS FOR EVERYONE)***

Methodolgy

At the beginning, the workflow was bases on georeferencing screenshots from Google maps. hiight tedious Work the did not value to the monitoring of the evoluton.

Then we dedided to ***Change the workflow*** inscrease efficiency while preserving the quality of georeferenced data. We began by monitoring the beaches using ***high resoluiton images from helicoper and drones flight, marice and land pics*** as well as using the most advanced technoligies provided BY EOS and RPS. Once the high-resolution images were referenced, we made web scenes capable of giving us the most realistic and rigorous follow-follow up of the field events



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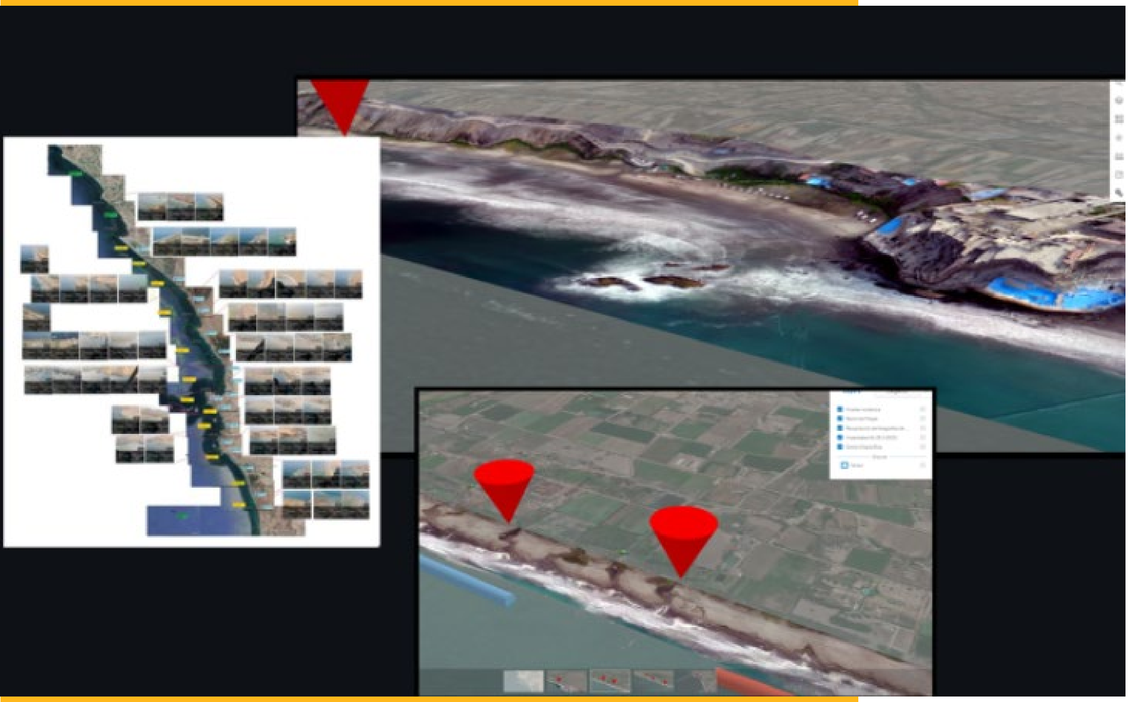


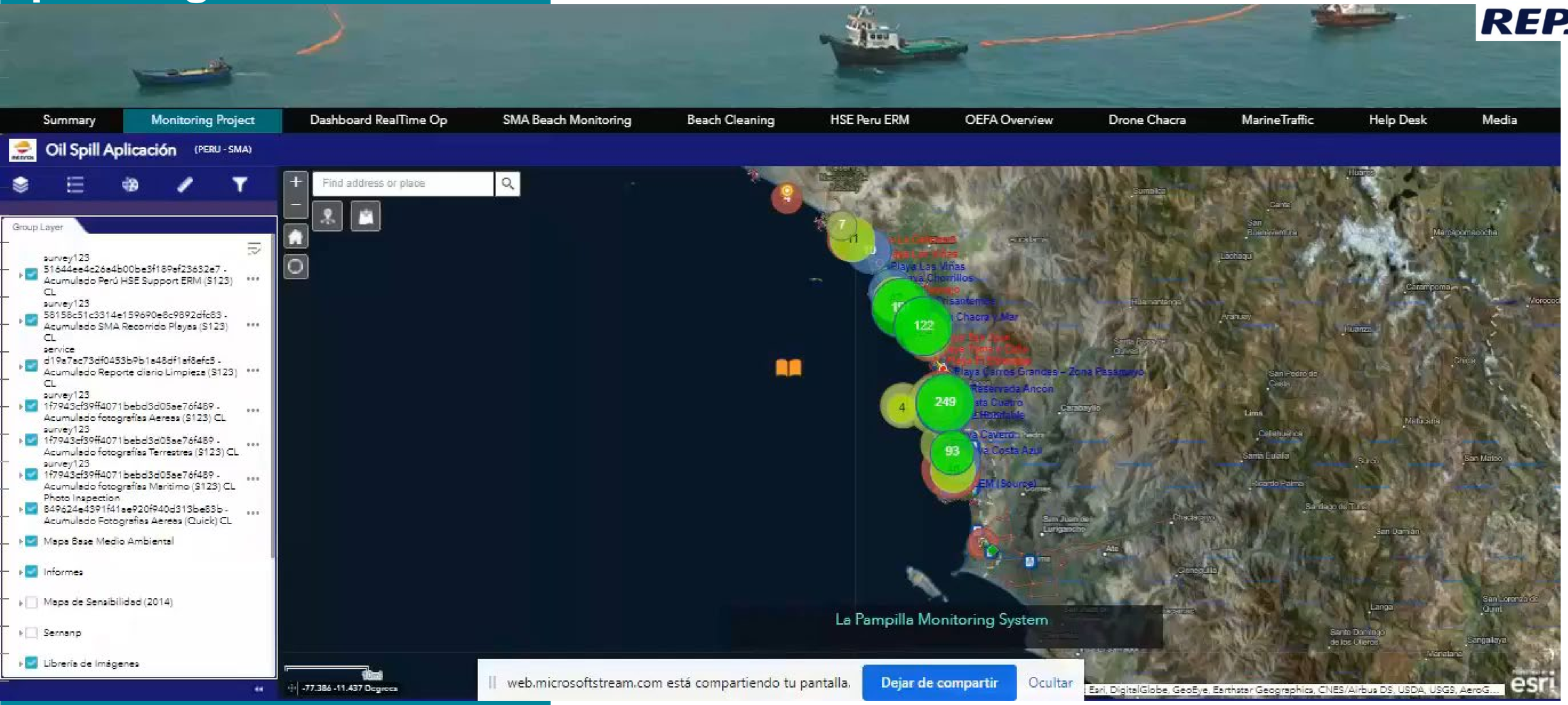
Methodolgy

- Agile Metholology was base of our estrategy. Baby sted to build a tailor-made Solution, flexible to be modify or adjust depending the needs.
- The GIS team deliveried the first survey to show Crisis room team the benefits to move to new technologies, (Time, Efficicency, reporting, Data driven desitions)
- Daily Work guided us about what solution would be better fit in their sctivities (quick capture by helicopter inspections.
- Information to predict oil spill localizations were integrated to our GIS SyStem (3th parties). Refining the model using dad colleted daily in field.
- Automatic processing data-loading standardization (Orthophotos from six diferente providers) combining GIS tools.
- Automatin Reports (Templates) using Survey 123 data collected in field.

TOOLS

Survey 123
Quick capture
Operational dashboards
Workfoce
FME
ArcGIS Interprise
Experience Builder
Story maps

GIS Monitoring plafort for Spill Mitigations Solution



Emergency Response in numbers

Support To Communities

+ 5100
people received an advance compensation payment

+ 9400
early response vouchers

Beach Cleanup

28
beaches cleaned

100%
fulfillment of the action plan for clean-up phase

+ 2900
people working on clean-up operations, at peak

38
Skimmers (high efficiency marine cleaning equipment)

68
storage tanks

35
larger vessels

144
heavy machinery units

+11000
meters of containment barrier installed.

54
smaller vessels

Customer satisfaction

- "The great challenge that the response to the spill presented required something more than the commitment and professionalism of all of us who participated, I needed the use of the latest technologies available in the management of information in real time, GIS gave us this part, being fundamental in the success of spill response activities "

José Terol. Crisis room Director and DIR. SMA INDUSTRIAL D.E. REFINO

- "Your Work in the development of both the GIS monitoring system and real-time photo capture application allowed the Organization not only to plan and document the daily response but also to show the authorities ans Media the the means deployed were adequate, avoiding futher sanctions and damage to the image of our comapany"

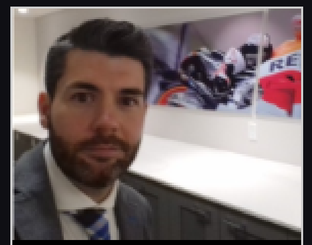
Raul Rioyo (Crisis Room Manager)

- " The GIS system provide a Dynamic, user.friendly inteface to analyze a number of different attributes and physicalinfromation gathered from the spill; foremmost, it provided a remarkable tool to speed uo decisión making and more accuarately quantiry offshore spill size, trajectory, and impacts"

- Isaac Nájera (Madrid) Environmental Leader & discipline manager

TEAM

Team



Juan José Corpas

TI GIS MANAGER & WEB Support

Marcela Torrado

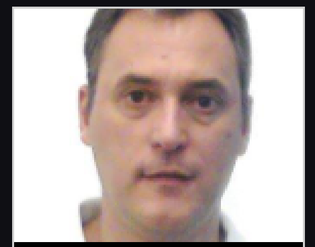
IM GIS MANAGER

Isaac Najera

ENVIRONMENT MANAGER & DISCIPLINE MANAGER

Ángel Lera

TI GIS MANAGER, WEB Support & REPSOL Guide



Raúl Rioyo

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3th parties

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