

# ALICE, ATLAS, CMS and LHCb career networking

Monday 13 November 2017

# Before moving to a NGO

2010-2012 Ph.D. in ALICE.

- Detector operations @ P2
- Analysis

2013-Jun 2015 CERN fellowship

- Coordination
- Paper writing

Jun 2015 - Jun 2016 Berkeley Lab.

- Supervision
- Teaching

# Why I decided to change

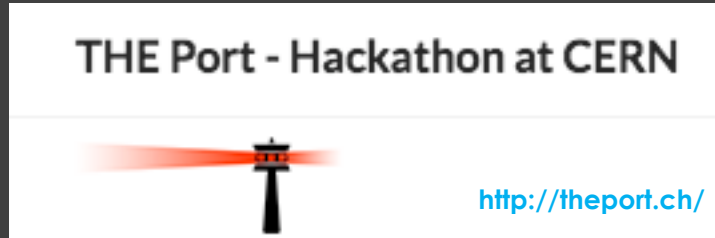
A key player:



“We combine creative minds from CERN and non-profit organisations in interdisciplinary teams to work on humanitarian technology related benefits to society.”

# Why I decided to change

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My network



My life

# The options



Banks



Medical physics



Big tech companies



Humanitarian / development sector

# People forced to flee worldwide

**22.5** million  
refugees worldwide as of  
Dec 2016

UNHCR and UNRWA data

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Persons by conflicts and violence  
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IDMC data

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worldwide as of Dec 2016

IDMC data

**24.2** million  
displacements by disasters  
in 2016

IDMC data



# The Internal Displacement Monitoring Centre

## UN Resolution A/C.3/70/L.51/Rev.1

Recognizes the need to collect **reliable disaggregated data**, including data disaggregated by sex, age and location, on internally displaced persons and the impact of long-term displacement on host communities in order to improve policy, programming and response to internal displacement and, in this respect, the relevance of the inter-agency Joint Internally Displaced Person Profiling Service and the **global database on internally displaced persons maintained by the Internal Displacement Monitoring Centre**;



NORWEGIAN  
REFUGEE COUNCIL

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**iDMC** Internal  
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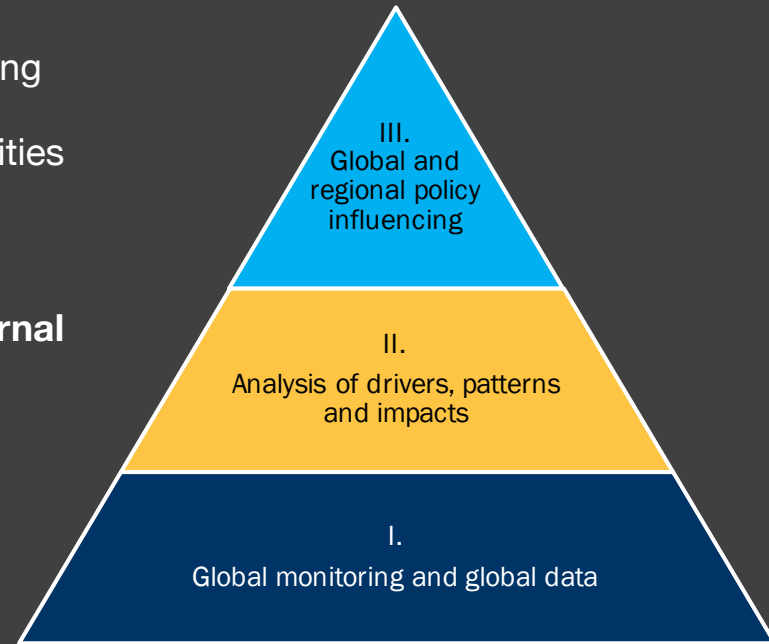
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**iDMC** Internal displacement monitoring centre

# My daily job as Senior Data Scientist

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# Machine Learning and Natural Language Processing

## India relocates 10,000 from Kashmir as tensions rise

By Rakhee Arora, Sophie ...  
Updated 05:05 GMT (02:05 ...)  
October 3, 2016



### Story highlights

Fakistan and India exchange gunfire Saturday morning

India relocates 10,000 from Kashmir this week

Pakistan

The two nations exchanged gunfire Saturday morning, with each accusing the other of provocation.

Srinagar, India (CNN) — India has relocated more than 10,000 people from around the disputed border area of Kashmir as tensions escalated this week with Pakistan.

At least 10 people were killed and 100 injured by the exchange of gunfire in the area. What was not clear was whether the exchange of gunfire was a result of a larger conflict or a localized skirmish.

**Srinagar, India (CNN) — India has relocated more than 10,000 people from around the disputed border area of Kashmir as tensions escalated this week with Pakistan.**

When?

What?

How many?

Where?

# Machine Learning and Natural Language Processing



Scale-it up globally?

India relocates 10,000 from Kashmir as tensions rise

By Rakhee Arora, Sophie ...  
 Updated 05:05 GMT (02:05 ...)  
 October 3, 2016

**Story highlights**

India and Pakistan exchange gunfire Sunday morning

India says it has evacuated 10,000 people from around the disputed border area of Kashmir as tensions escalated this week with Pakistan

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When?

What?

How many?

Where?

# The system we are developing

Python  
Web scraping  
ML models  
Text mining  
NLP models  
Postgres SQL



# The system we are developing

## Filtering and tagging



Python  
Web scraping  
ML models  
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# The system we are developing

Filtering and tagging

Information extraction

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# The system we are developing

Filtering and tagging

Information extraction

Validation

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# The system we are developing



From active information search



Python  
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Filtering and tagging

Information extraction

Validation



# The system we are developing



From active information search



To supervised information extraction

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Postgres SQL

Filtering and tagging

Information extraction

Validation



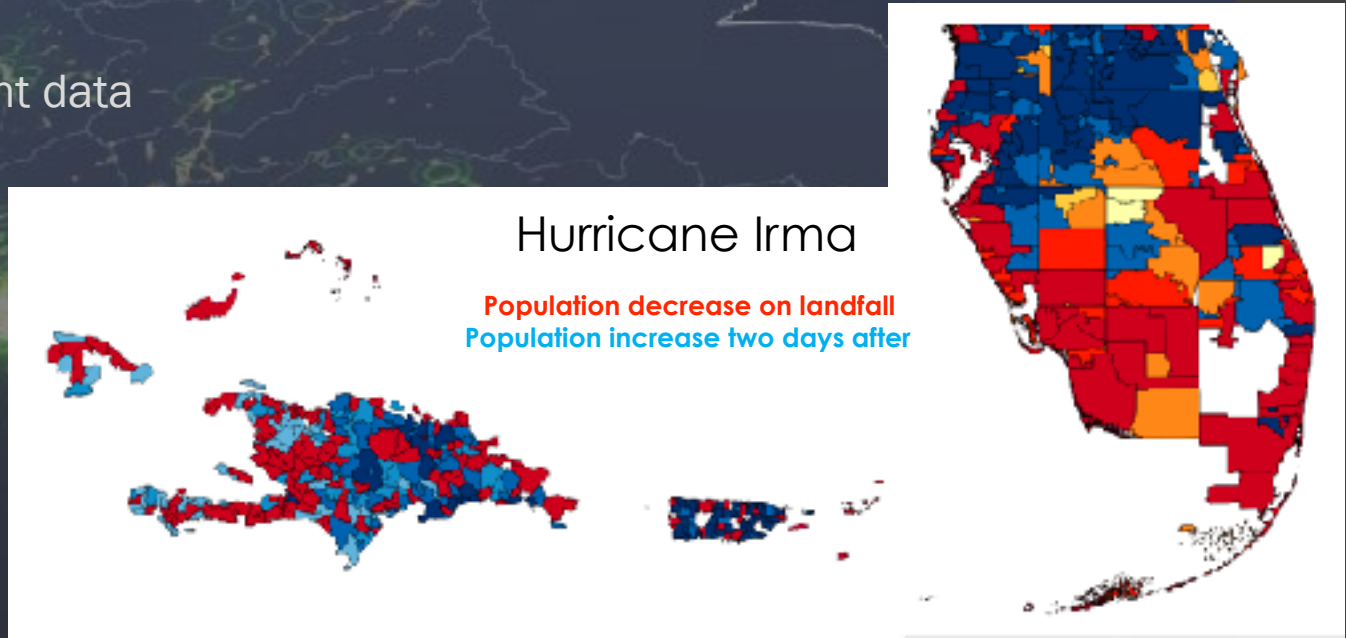
# Social Media



Location data

Safety checks

Movement data



GIS analyses  
Working with external partners

Tracking themes associated with “Violence” in central America



Python  
Working with REST APIs  
Natural Language Processing  
Sentiment analysis

# Disaster displacement risk modelling

## Climate change and disaster risk reduction



### Hazard



Disaster Risk Reduction concepts  
Climate Change research  
GIS analyses  
Communication of results and methodology

# Disaster displacement risk modelling

## Climate change and disaster risk reduction



Hazard x Exposure



Disaster Risk Reduction concepts  
Climate Change research  
GIS analyses  
Communication of results and methodology

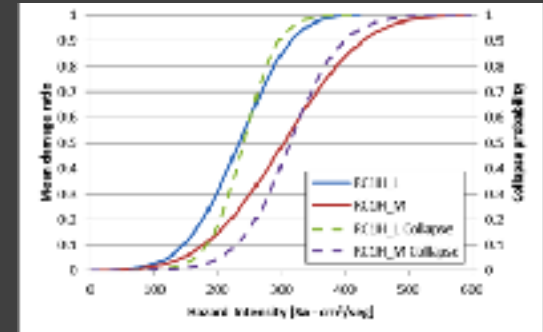


# Disaster displacement risk modelling

## Climate change and disaster risk reduction



Hazard x Exposure x Vulnerability



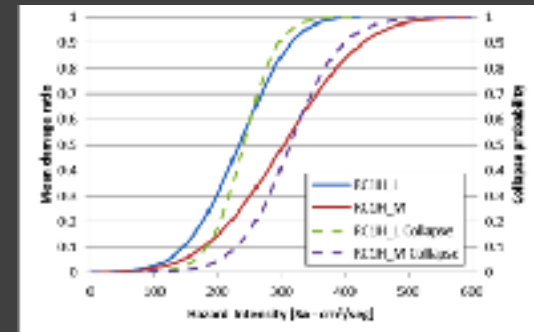
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# Disaster displacement risk modelling

## Climate change and disaster risk reduction



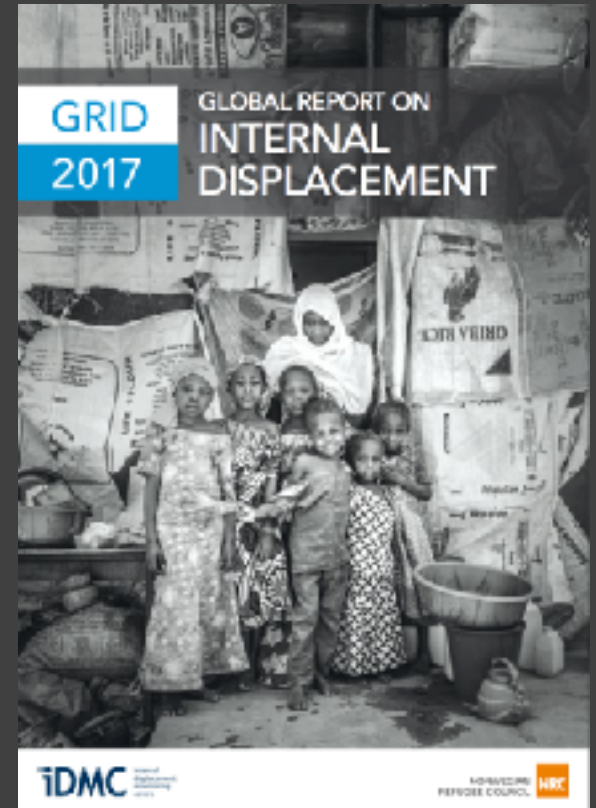
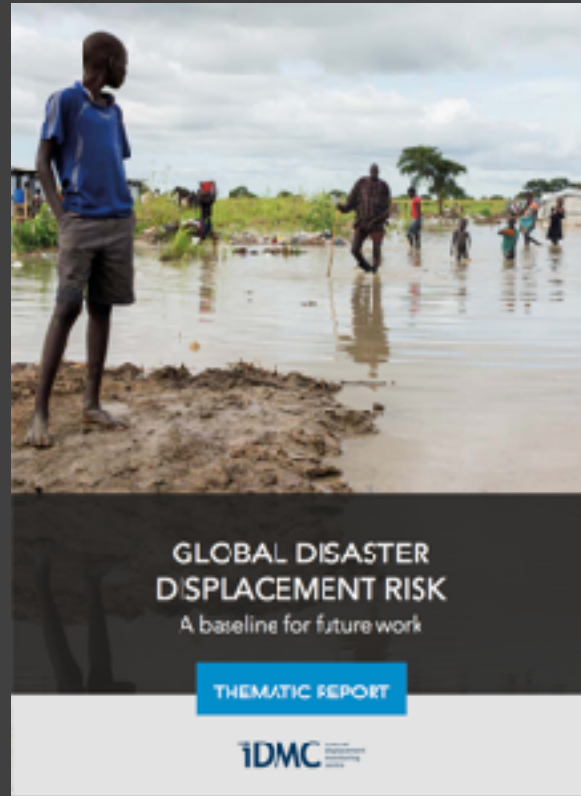
Hazard x Exposure x Vulnerability



Most of the disasters that could take place have not yet happened.

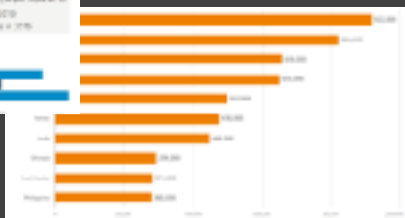
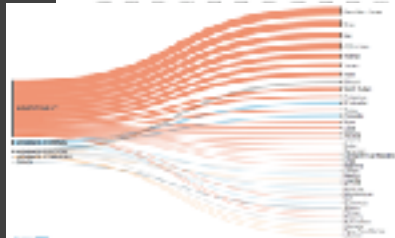
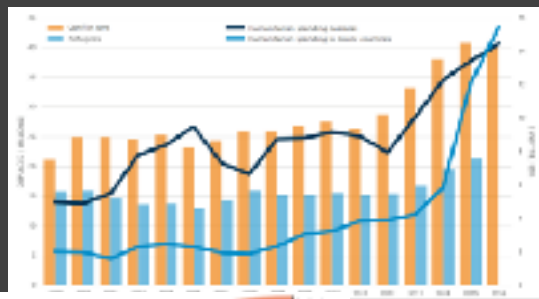
Disaster Risk Reduction concepts  
Climate Change research  
GIS analyses  
Communication of results and methodology

What's the human impact of natural hazards?



Writing for non-technical audience  
Working with many people with different backgrounds

# Data visualisation



## Global Displacement Risk Model

**About the risk model**  
This risk model details the results generated by our predictive displacement risk model. It provides an overview of the model's algorithm to score potential countries for internal displacement risk based on the score of risk by measuring the likelihood of future population movements throughout the year.

**Filters** [Clear]

Goal: analysis/assessment type [0]

Progression [0]

Event type: SearchType [0]

Reference [0]

Event type: SearchType [0]

Model [0]

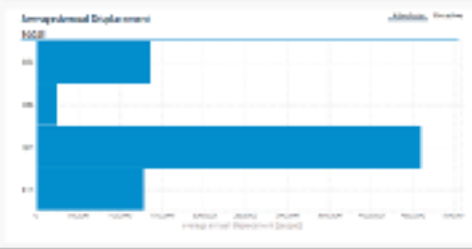
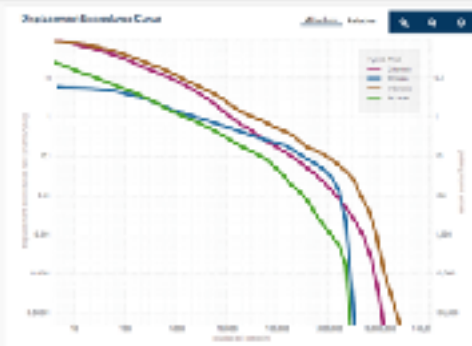
Group: risk and country [0]

Region/Countries

Region: Sub-Saharan Africa, Sub-Saharan Africa, Sub-Saharan Africa

Country: Sudan, Sudan, Sudan

Legend: IDPs, IDPs, IDPs



<http://www.internal-displacement.org/database/global-displacement-risk-model>



Python  
ArcGIS and QGIS  
Postgres SQL  
Working with designers  
JavaScript

# Field / data collection / analysis support

We don't do primary data collection but we support governments, INGOs and other stakeholders.

Direct contact  
with field offices



Field / HQ  
missions



Partnerships in  
Geneva / NY



Understanding challenges in the field

# Partnerships

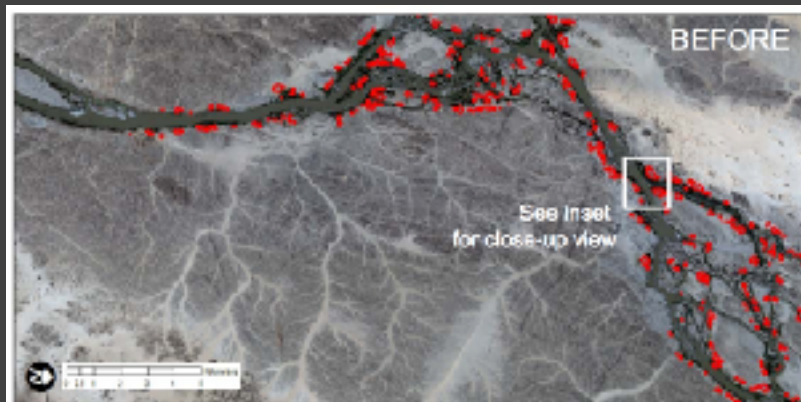
## LEVEL 1: GLOBAL MONITORING AND DATA COLLECTION

## LEVEL 2: RESEARCH AND ANALYSES OF DRIVERS, PATTERNS AND IMPACTS

## LEVEL 3: GLOBAL AND REGIONAL POLICY INFLUENCING

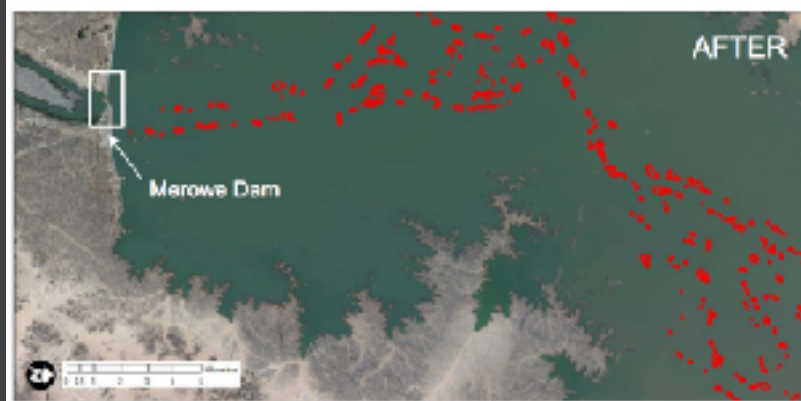
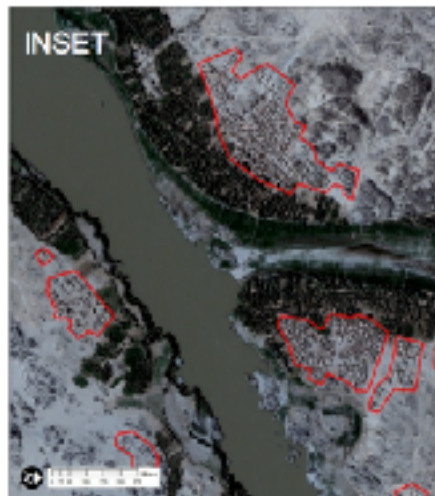
- ACAPS
- Bonn International Center for Conversion
- Climate Interactive
- EC-JRC, the Joint Research Centre of the European Commission
- Flowminder
- GDELT
- Georgetown University
- HDX
- Housing and Land Rights Network
- ICRC
- IFRC
- INFORM
- IOM
- International Accountability Project
- International Rivers
- JIPS
- MIT
- OCHA
- Oregon State University
- Platform on Disaster Displacement (PDD)
- RAED, the Arab Network for Environment and Development
- REACH
- Refugees International
- UN HABITAT
- UN Special Rapporteur on the Human Rights of IDPs
- UN Unite Ideas
- UNDP
- UNEP
- UNHCR
- UNISDR
- UNOSAT
- UNU
- University of Delft
- University of Liège (Hugo Observatory)
- University of London
- University of Oxford
- World Bank

# Satellite imagery analysis



 Inhabited area

– 400 ha of destroyed inhabited area in the analyzed section of the reservoir.



Before imagery: 29 December 2005, GeoEye-1

After imagery: 25 November 2016, QuickBird-2

Copyright © 2017, DigitalGlobe  
Source: US Department of State (DOD), GeoView License

## Final remarks

The field is expanding significantly

Happy to have changed after several years spent doing research ...  
and happy of still doing research

Come to see me after if you want to know more, we welcome any  
type of collaboration



THANK YOU !





[www.internal-displacement.org](http://www.internal-displacement.org)