National Disaster Observatory

Integrating space-based
information for effective disaster management

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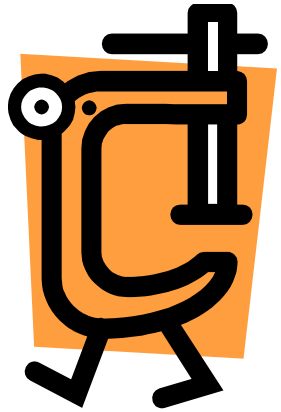
Outline

1、Background

2、NDO Development

3、Conclusion & Next Plan



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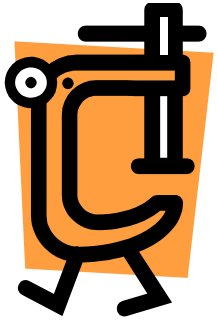


Laboratory for NDO

- The NDO is developed, based on CERAM Shanghai, a Center of Excellence for Disaster Assessment and Management supported by UNDP, and a Laboratory for National Disaster Observatory

Developing Technologies for National Disaster Observatory (NDO)

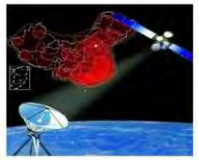
National Disaster Observatory is a Disaster Information Management System designed for systematically collecting, storing, analyzing, and disseminating of disaster-related data and information (Disaster Information), with key applications to:

- Disaster Loss Accounting (灾损统计)
- Disaster Forensics（灾情分析）
- Disaster Risk Modeling（灾难风险建模）

National Disaster Observatory (NDO)

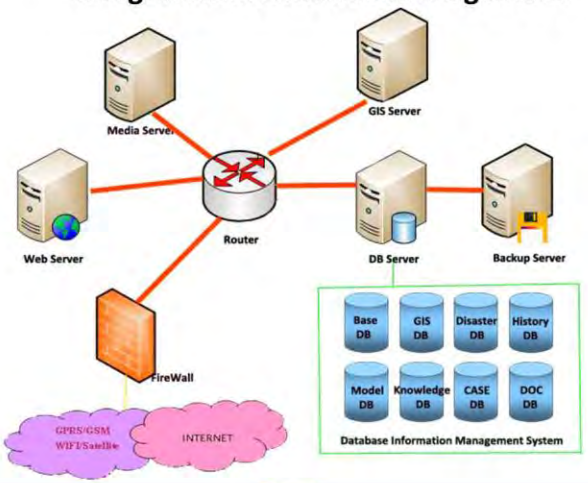
Innovative Data Collection

Mobile Devices

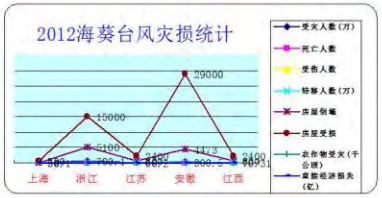


Satellite systems

Integrated Information Management

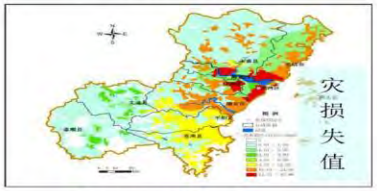


Instant Disaster Analysis and Mapping

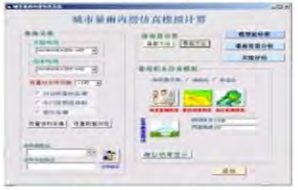


Disaster Loss Statics

Typhoon Path Monitoring



Disaster Loss Mapping



Flooding Simulation

Information Dissemination

Access to the public

Dynamic Visualization at
Emergency Operation Centre

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NDO Development in First Phase

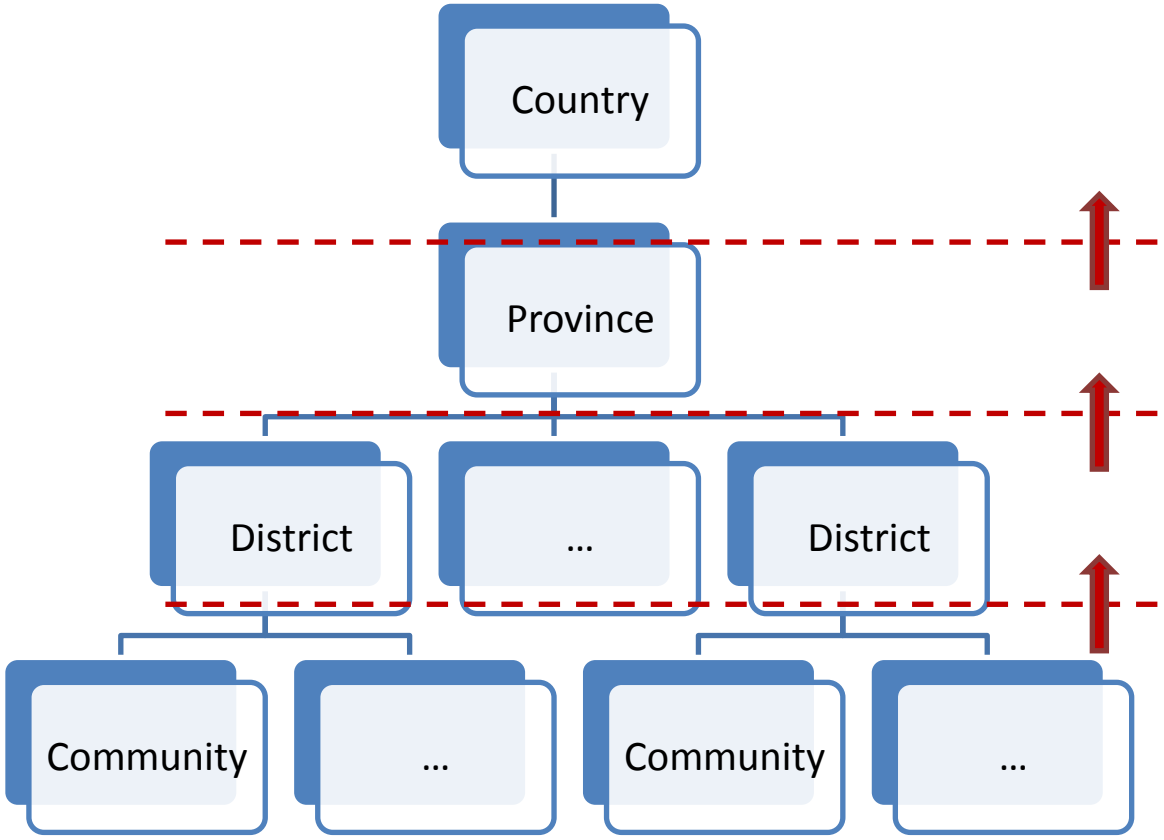
- Disaster Information Collection and Reporting System based on **Smart Handheld Devices** and **WEB Online**
- Integrated Data Management System
- Information Dissemination Platform

Disaster Information Collection Based on Smart Handheld Devices

- Map Exploration
- Location Positioning
- Geometric Measurement
- Photo Taking
- Sound Recording
- Information recording and Reporting
- Historical Record Query

Disaster Information Collection and Reporting System based on **WEB Online**

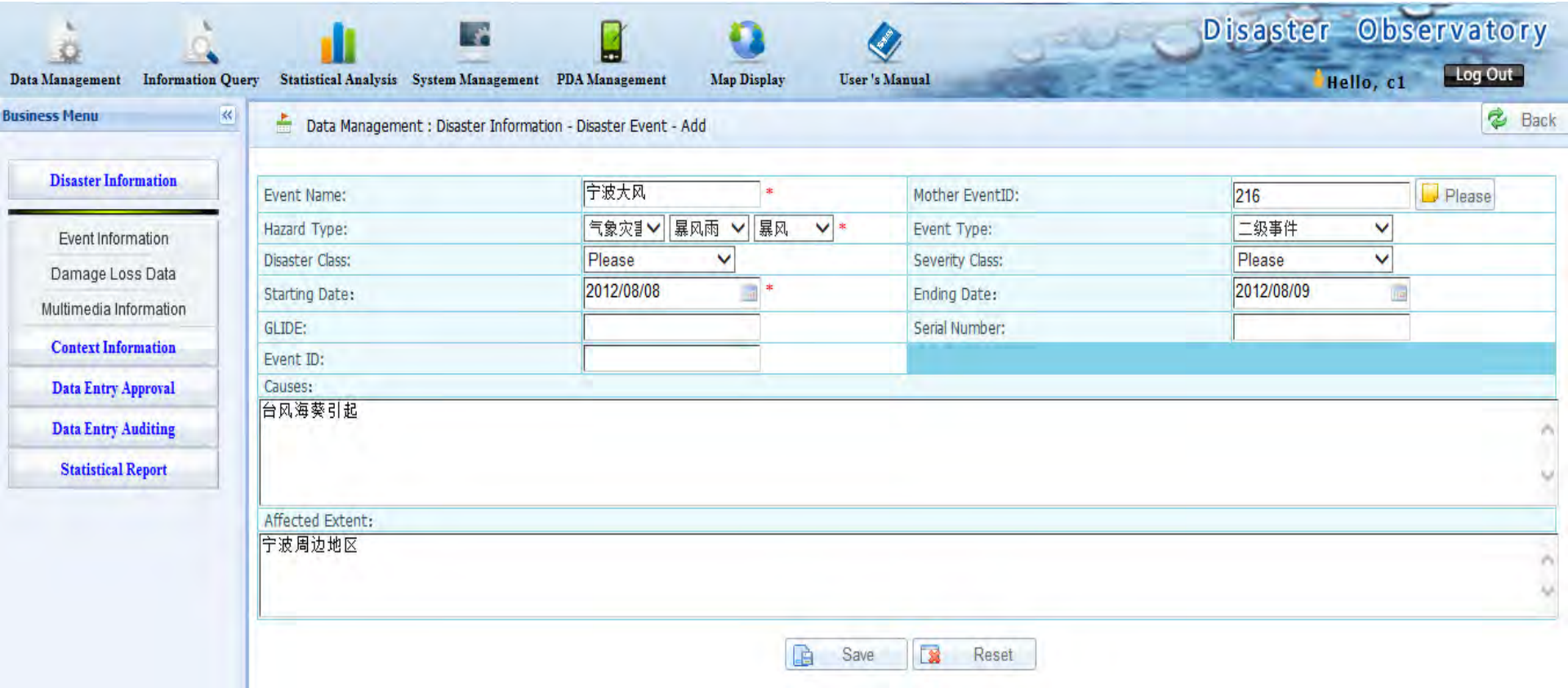
1. Collecting Disaster Information Based on Administrative unit, and Reporting Level by Level



Reporting Mechanism

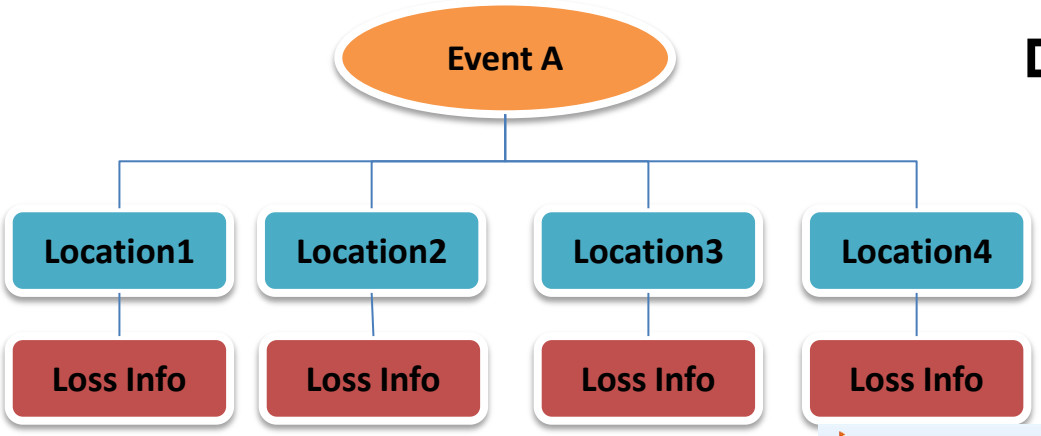
2. Essential Information Collection

- Including Event, Disaster Loss, Context Information etc.
- In addition, Recording the Disaster Process Information



- Event Information:
  - ✓ Hazard type, intensity, location, time that events start and end, affected extent,
  - ✓ event chain information.
- Disaster loss information
  - ✓ Affected population, physical damage, functional disruption, economic loss and macro-impact.
  - ✓ Disaster classification
  - ✓ Loss information is recorded based on location, or basic administration units, and also based on economic sectors.

3. Disaster Loss Information Collection



- Location-based Loss Information Recording

- Sector-based Loss Information Recording, the sectors can be Customized

Data Management : Disaster Information - Loss Data - Incidence Site - Loss Details - Add

Back

Economic Loss in Industries:	12311	Economic Loss in Agriculture:	8212
Economic Loss in Infrastructure:	19431	Economic Loss in Public Facilities:	4354
Economic Loss in Family Property:	2421	Exchange Rate:	6.5

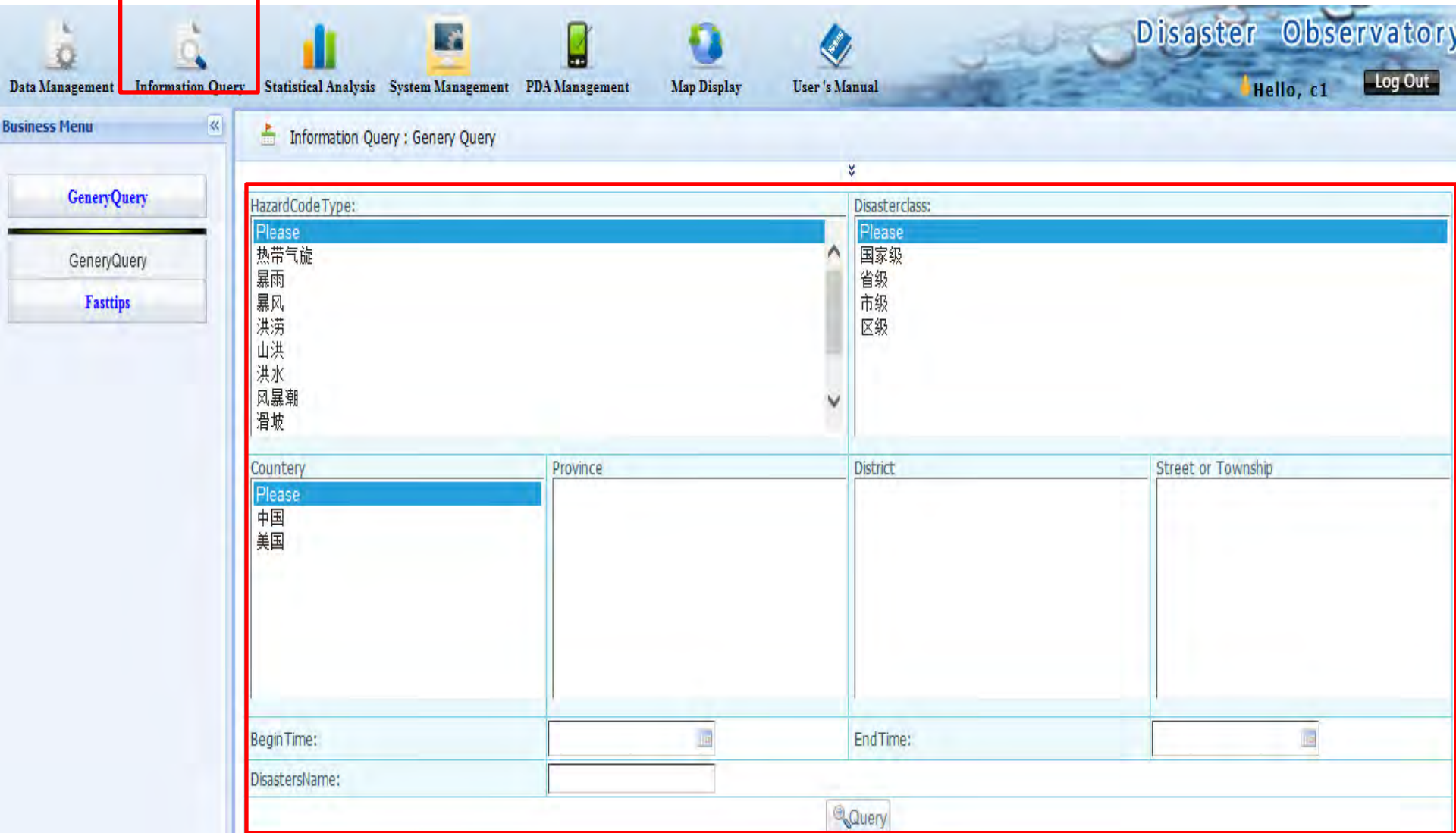
Loss_HumanLives_Genaral | Loss_Fisheries | Loss_Power_Communications | Loss_Transportation | Loss_Buildings | Loss_Relief | Loss_Water_Supply_Irrigation | Loss_Agriculture_Livestock

No. Affected Males:	110081	Economic Loss	5.5232
No. Affected Females:	90881	Economic Loss	4.012
No. Dead Males:		Economic Loss	0
No. Dead Females:	1	Economic Loss	0
No. Injured Males:	431	Economic Loss	251
No. Injured Females:	663	Economic Loss	331
No. Affected Families:		Economic Loss	0
No. Evacuated Families:		Economic Loss	0
No. IDP Camps:		Economic Loss	0
No. People in Camps:		Economic Loss	0
No. Missing:		Economic Loss	5
No. Families in Camps:		Economic Loss	0
Loss in HumanLives:			

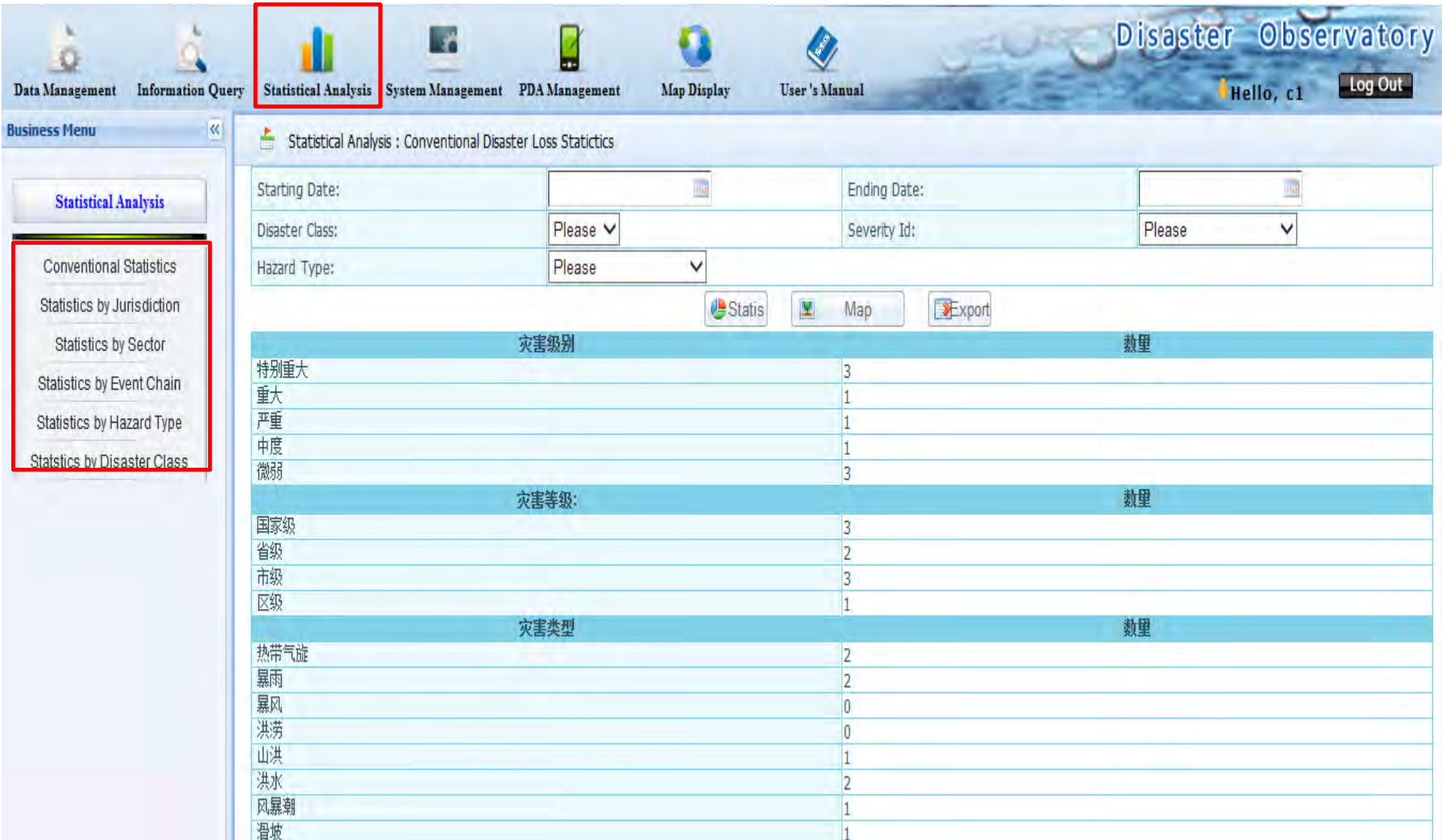
2. Disaster Information Management

- including： Event Information, Damage Loss Data, Multimedia Data

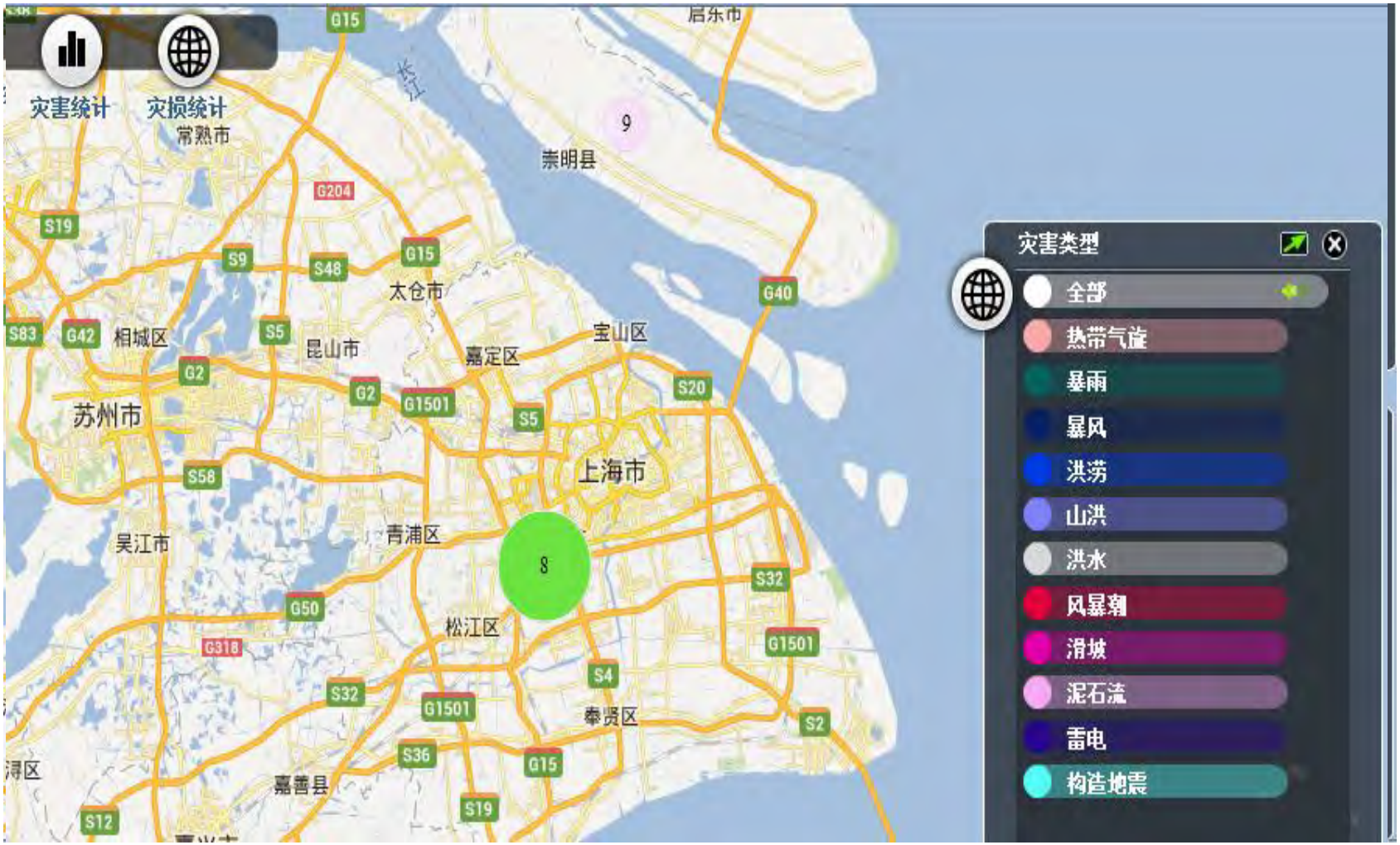
3. Disaster Information Query



4. Disaster Information Statistical Analysis

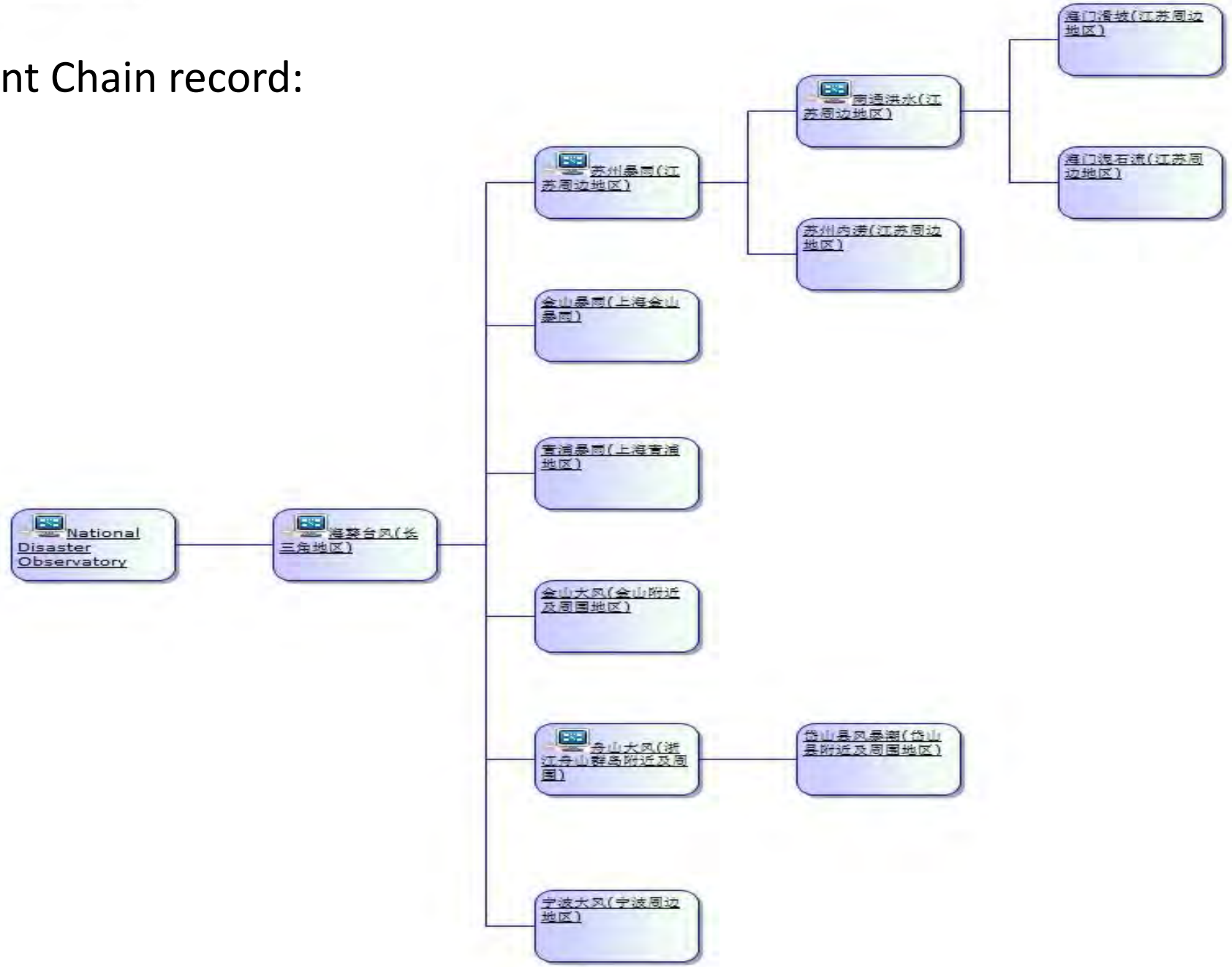


5. Spatial Query & Statistics



Root position: Left

Event Chain record:



7. Background Information Management of geophysical, social-economic data, and maps, etc.

Address	Year	AreaAcreage	Rresident Population	External Population	Population Density
上海市-黄浦区	2011	20.46	68.04	18.41	33255
上海市-徐汇区	2011	54.76	109.50	28.52	19996
上海市-长宁区	2011	38.30	69.00	17.15	18016
上海市-静安区	2011	7.62	24.36	5.28	31969
上海市-普陀区	2011	54.83	129.72	36.24	23659
上海市-闸北区	2011	29.26	83.80	20.23	28640
上海市-虹口区	2011	23.48	85.16	19.13	36269
上海市-杨浦区	2011	60.73	132.43	28.07	21806
上海市-闵行区	2011	370.75	248.40	124.08	6700
上海市-宝山区	2011	270.99	193.50	77.93	7140
上海市-嘉定区	2011	464.20	150.62	85.96	3245
上海市-浦东新区	2011	1210.41	517.50	214.64	4275
上海市-金山区	2011	586.05	75.87	22.93	1295
上海市-松江区	2011	605.64	165.00	100.28	2724
上海市-青浦区	2011	670.14	111.76	64.22	1668

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8. Management of Administrative Division Change

9. Visualization and Dissemination

- Location Distribution of Disaster
- Event Track Playback Display

NDO Website Platform

Dissemination platform based on internet.

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Disaster Information Collection and Reporting System based on **Smart Handheld Devices** and **WEB Online**

Integrated Disaster Information Management:

- Geospatially-based Information Collection
- Context Information
- Tracing administrative unit change
- Event and disaster classification
- Hazard Event Chains
- Information Visualization
- System can be Customized

NDO has solved the five key issues for recording disaster information

- Necessary disaster-related context information should be included.
- Disasters must be classified.
- Event chains must be tracked to avoid duplicating disaster loss accounting.
- Changes in administrative boundaries must be tracked.
- Records in the database can’t be directly used to statistic analysis.

Next Step

1. Disaster and Risk Analysis & Assessment tools
2. Hazard Monitoring and Early Warning
3. Disaster and Risk Modeling

Applied for Disaster Preparedness, Disaster Relief, Decision-making

Thank You !