

GIS supports the restoration of the nuclear disaster in Fukushima

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Outline:

1. **The nuclear disaster in Fukushima.**
2. **Decontamination projects for the restoration.**
3. **The case of Kawamata town, which GIS supports the decontamination project.**
4. **For securing safety and reliability of inhabitants.**

Great East Japan Earthquake and Tsunami in 2011.



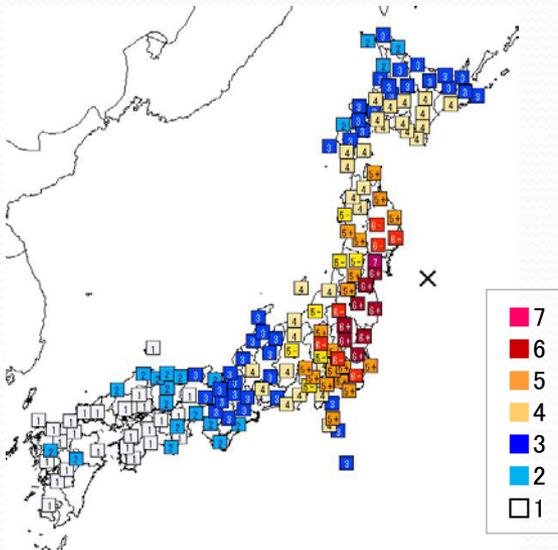
Date : 2011.3.11, 14:16

Magnitude : 9.0

Flood area : 561km²

Deaths: 15,894

Missing : 2,561 (2016.3.10)



seven-stage seismic scale*



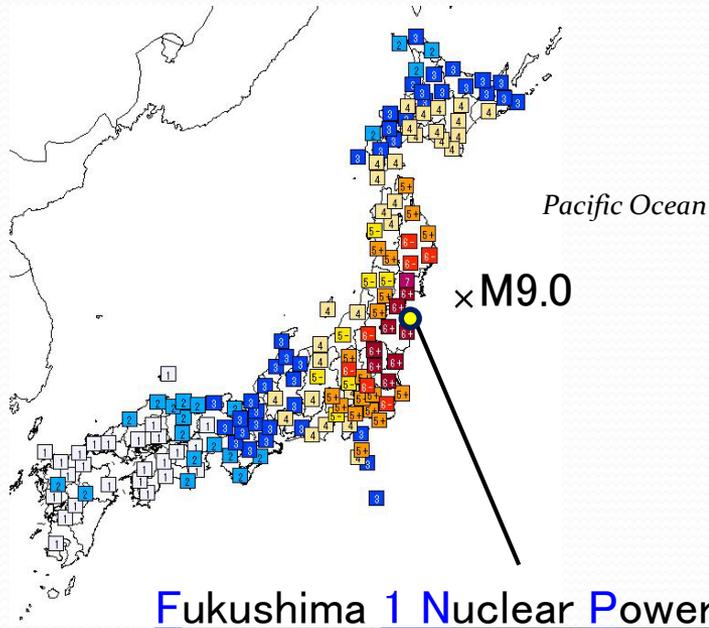
Rescue activities**

* Japan Meteorological Agency , Japan (<http://www.jma.go.jp/jma/indexe.html>)

** Ministry of Defense , Japan (<http://www.mod.go.jp/j/approach/defense/saigai/tohokuoki/>) 2

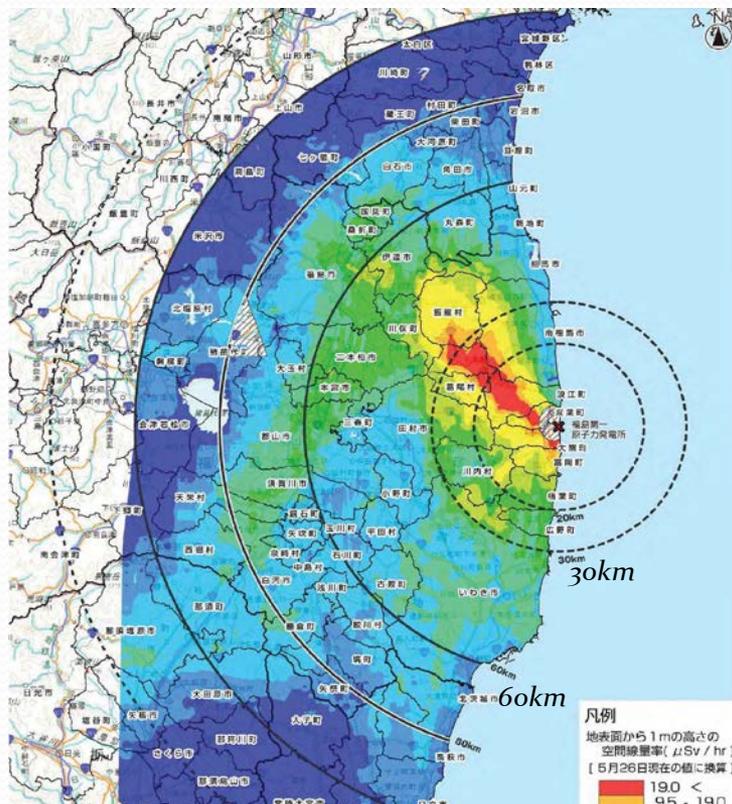
After the Tsunami, the nuclear accident occurred in F1NPS.

Emergency actions by disaster relief teams*



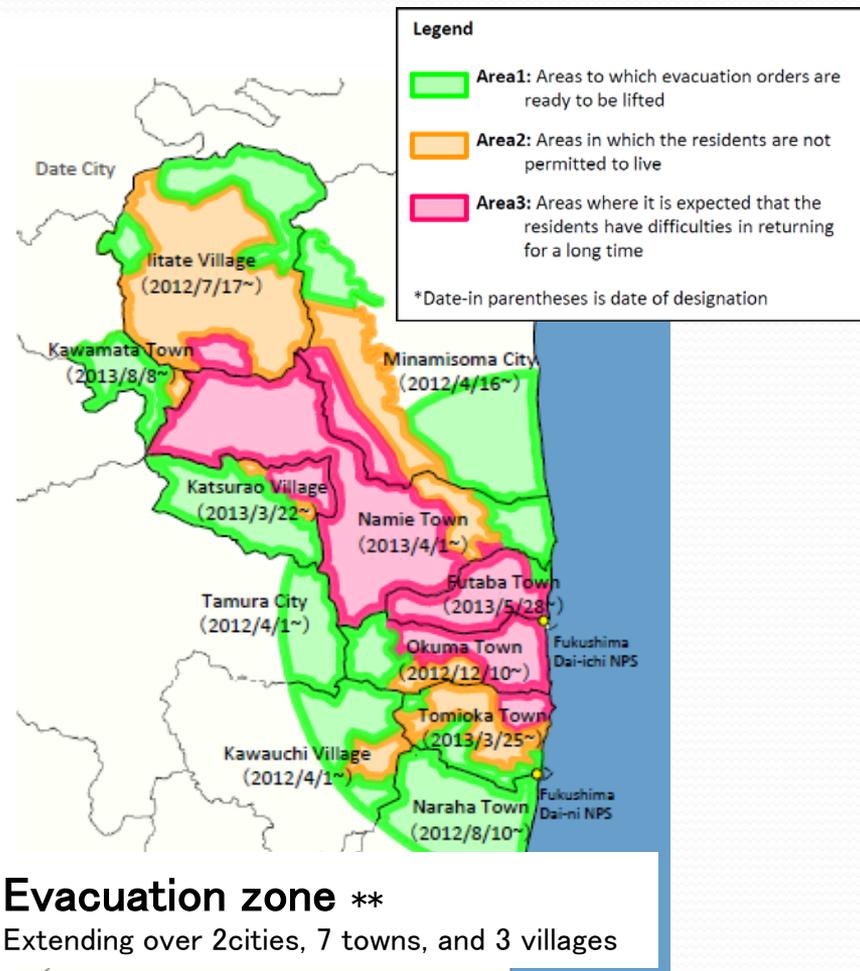
* Ministry of Deffence , Japan :YouTube modchannel (<http://www.mod.go.jp/j/approach/defense/saigai/tohokuoki/>)

Radioactivity substances were released to the air, evacuation zone was designated across 2 cities, 7 towns, and 3 villages. Over 164,000 people were forced to evacuate in Fukushima.



Airborne monitoring *

Detected by helicopters, 300m above the ground surface. (May, 2011)



Evacuation zone **

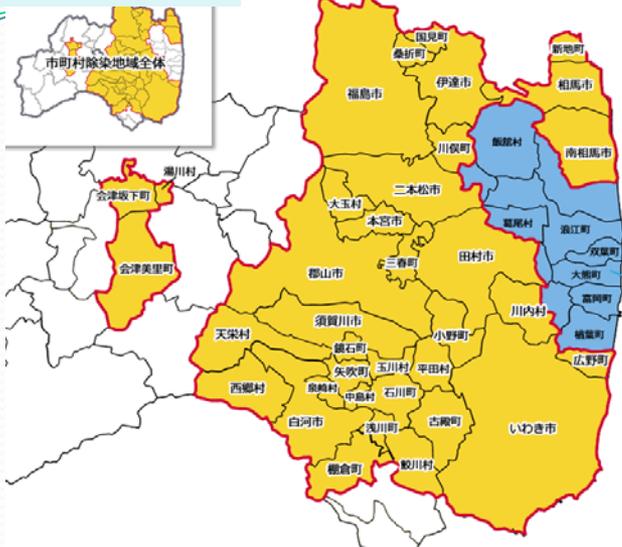
Extending over 2 cities, 7 towns, and 3 villages

* Nuclear Regulation Authority (<http://radioactivity.nsr.go.jp/ja/list/191/list-1.html>)

** Ministry of Economy, Trade and Industry (<http://www.meti.go.jp/earthquake/nuclear/kinkyu.html>)

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Decontaminated zones in Fukushima

The first step of the restoration was to remove the radioactive substances.

Decontamination projects were planned following 「The Act on Special Measures concerning the Handling of Radioactive Pollution」 in 2011.

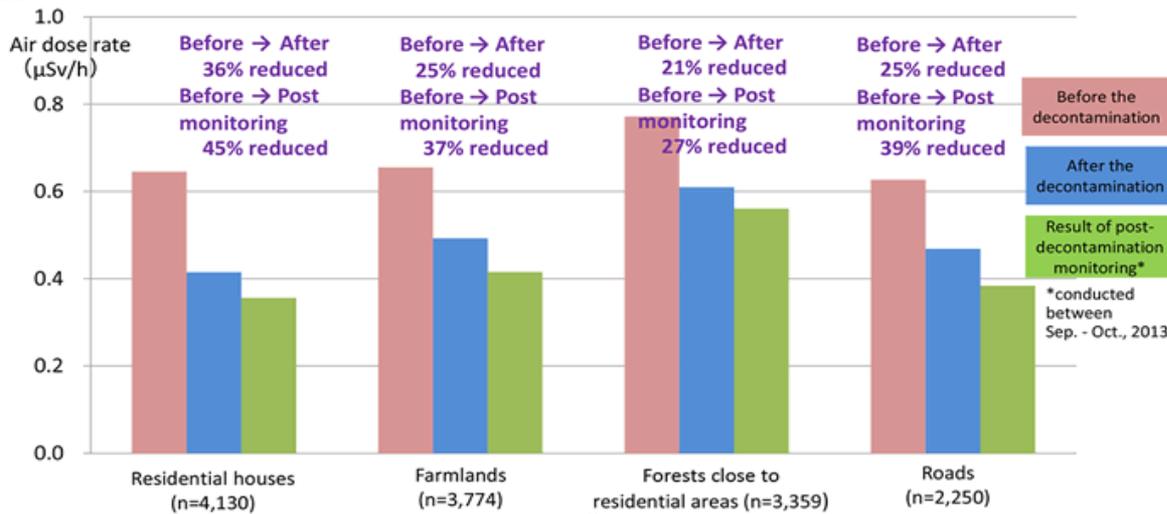
Legend	Zone name	Agency	Summary
Light blue	Special decontamination area	National Government	The "former planned evacuation zones" where the annual integral dose may exceed 20 mSv and the "former warning zones" located within 20 km of the F1NPS.
Red frame	Priority contamination survey area	Municipality	Municipality including areas where the annual additional exposure dose exceeds 1 mSv.
Yellow	Municipalities where the decontamination plan is in effect	Municipality	Municipality where a decontamination plan was drawn up and is in progress.

Techniques Used for Decontamination

- Houses, buildings
Removing deposits from the roof, deck , and gutters
Wiping off roofs and walls, high-pressure washing etc.
- Gardens and trees
Mowing, removing fallen leaves, topsoil stripping etc.
- Roads
Removing deposits in ditches, high-pressure washing etc.

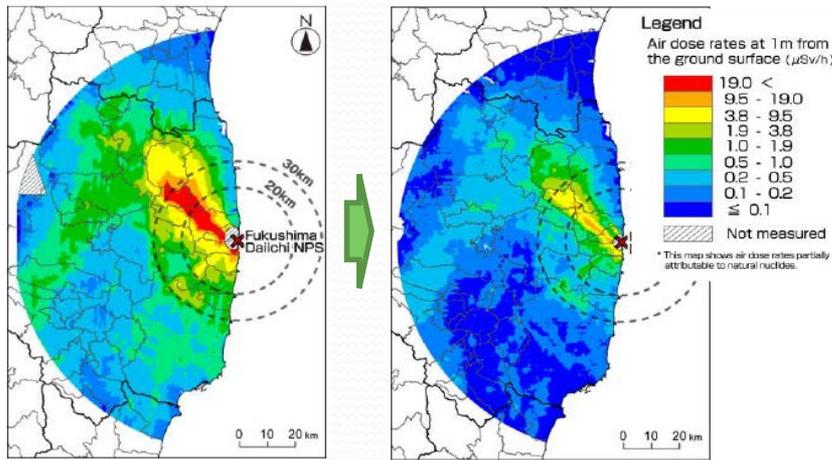


Effects of decontamination and radiation levels in Fukushima



Effect of decontamination *

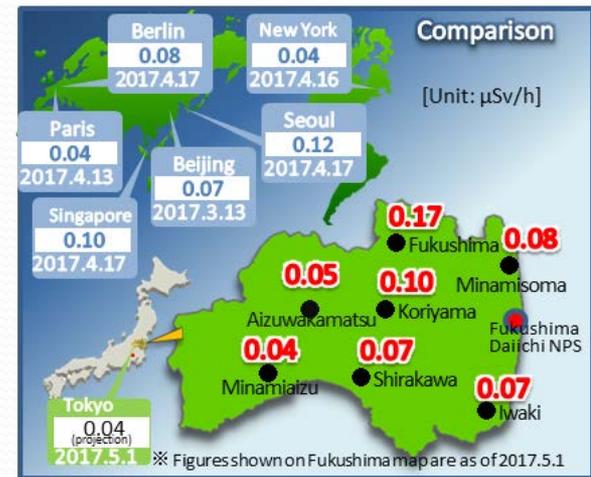
* Ministry of the Environment, Japan “Progress on Off-site Cleanup and Interim Storage in Japan”
 (http://josen.env.go.jp/en/pdf/progresseet_progress_on_cleanup_efforts.pdf)



1 months later(2011.04.29)

67 months later(2016.10.15)

Airborne monitoring **



Comparison between overseas major cities ***

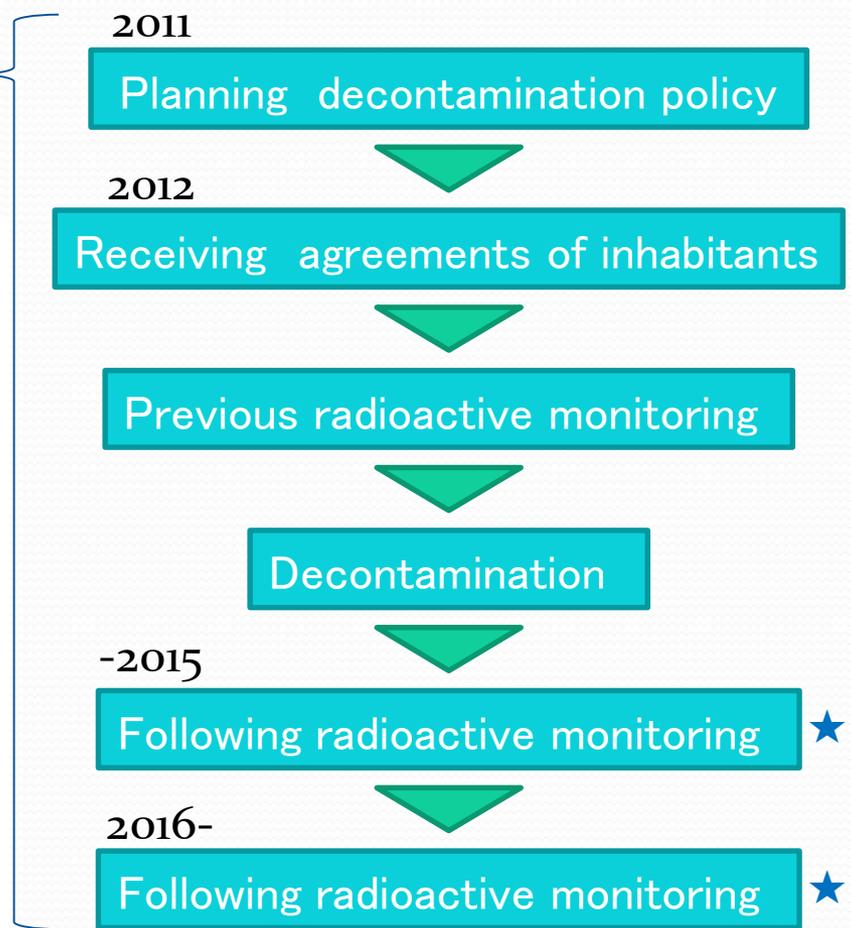
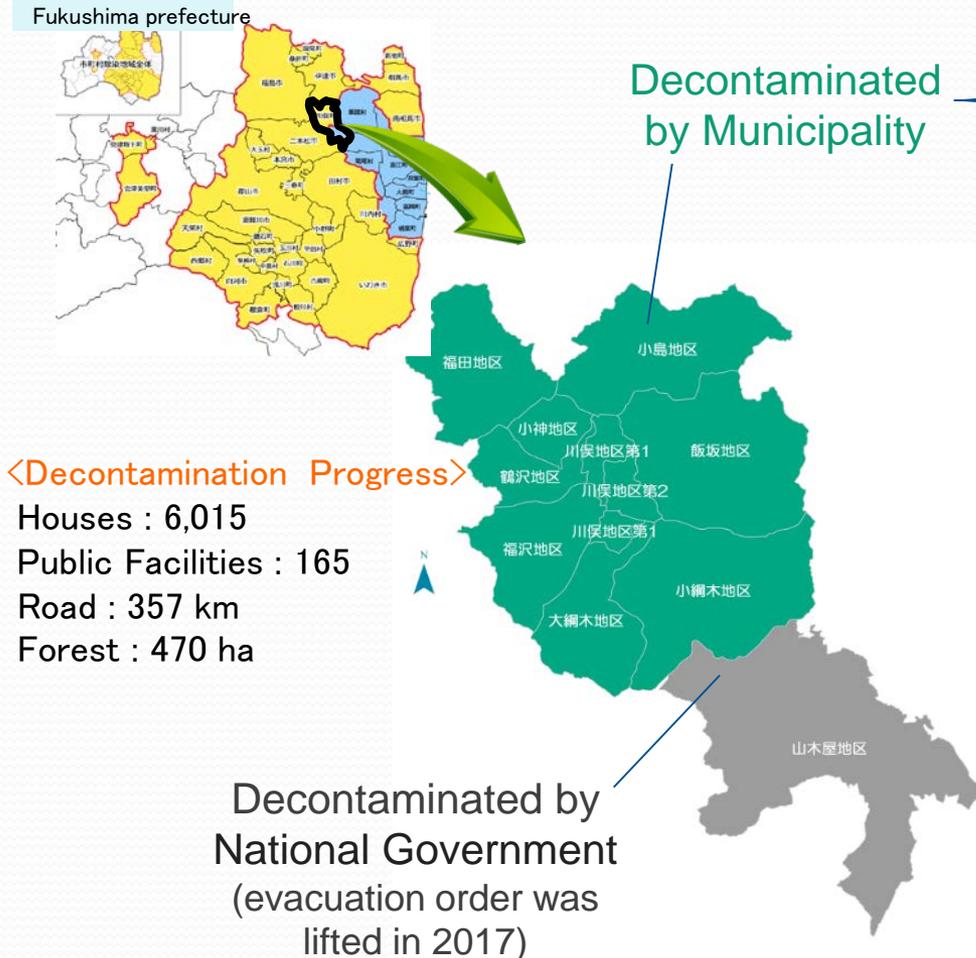
** Nuclear Regulation Authority, Japan (<http://radioactivity.nsr.go.jp/ja/list/191/list-1.html>)

*** Fukushima Prefecture (<https://www.pref.fukushima.lg.jp/sec/01010d/koho-chosakuken.html>)

Outline:

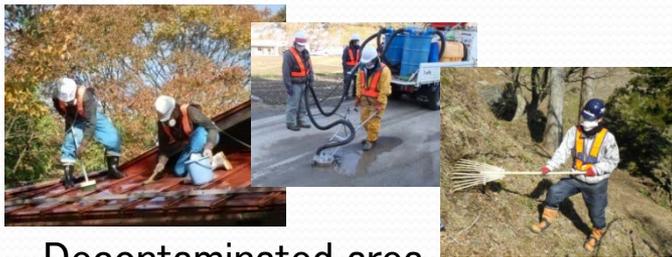
1. The nuclear disaster in Fukushima.
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Kawamata town is located in north-east area of Fukushima prefecture. The half of the town was neighboring the evacuation zone. One of the most important policy was to secure safety and reliability of inhabitants.

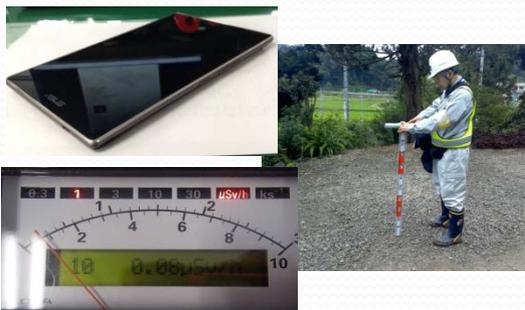


★ : sending reports to inhabitant

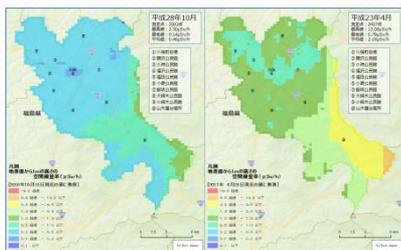
In the case of Kawamata town, the related information are consolidated into Geological Information System “AlandisNeo” which supports the project management.



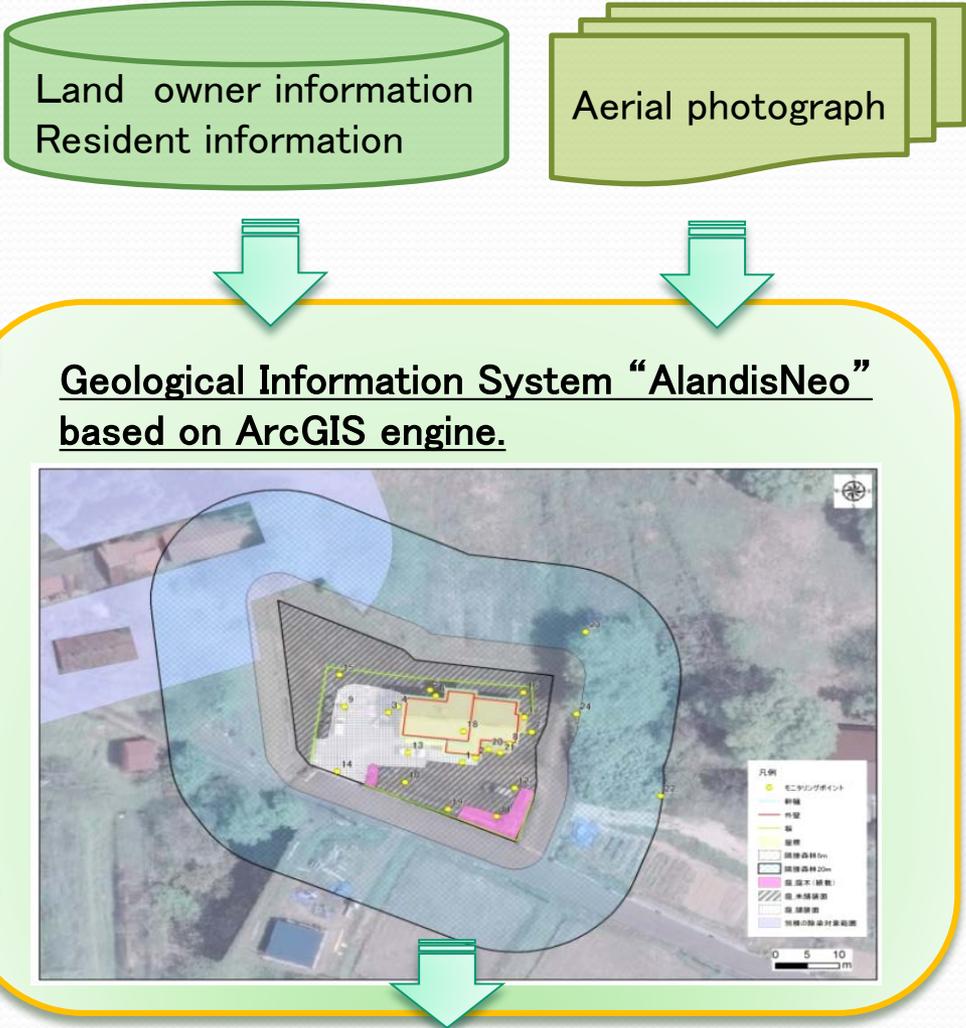
Decontaminated area
Records of radioactive waste



Radioactive monitoring points
Measurement results

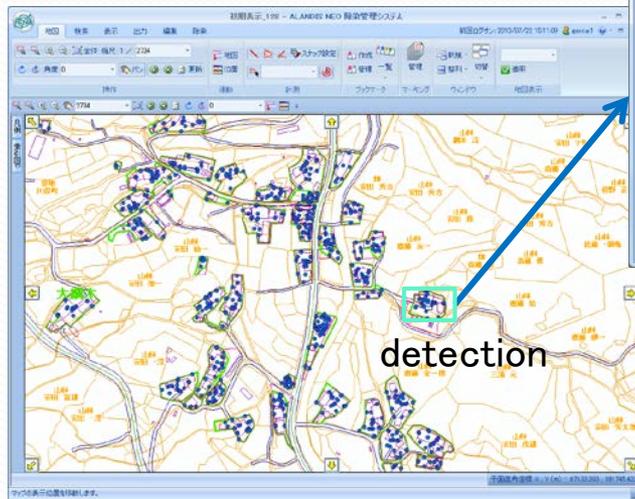


Radiation maps (point/mesh data)

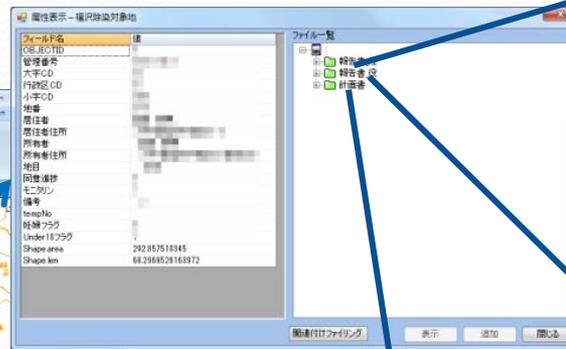


In order to search the information easily, reports and photos of operations are linked with shape files including individual information.

Searching by ID, owner's name, resident's name, address..

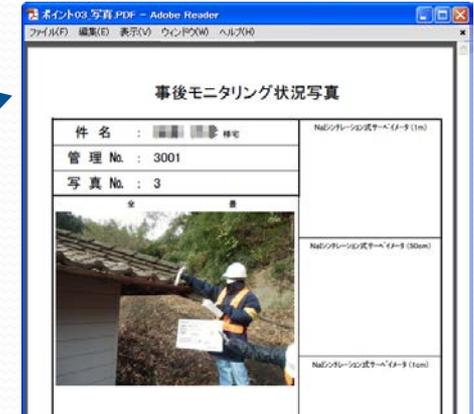


Shape file context

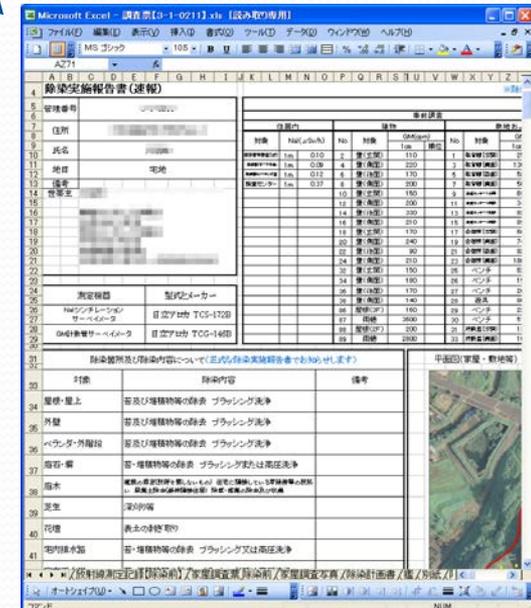


Linked data

Photos



Individual report

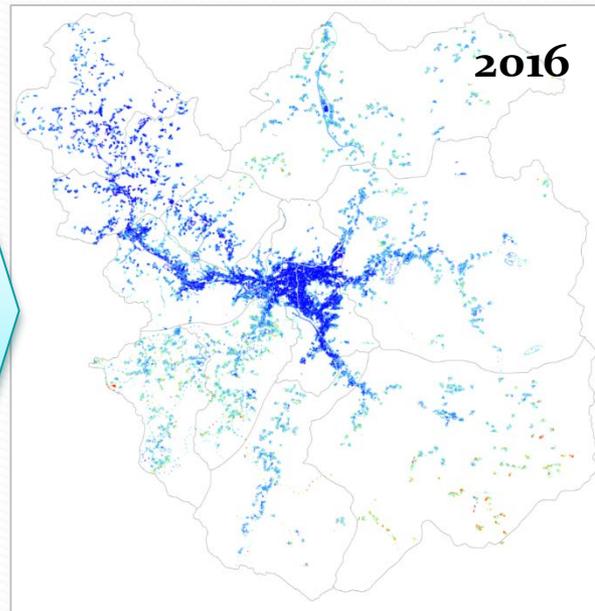
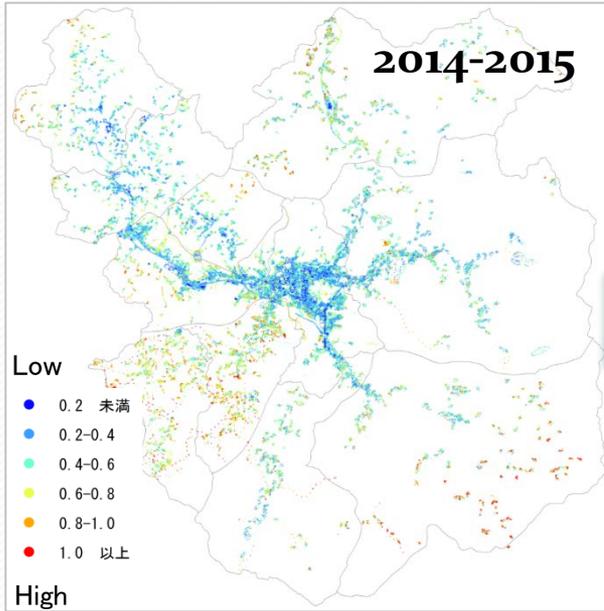


Other reports

名称	面積	作業	時間	作業量
下草・灌木刈払い	2,787.44	㎡		
雑草の除去 (管理地)	2,787.44	㎡		
雑草の除去 (管理地)	9.00	㎡		
樹立ち、切り戻し	711.23	㎡		
竹林の竹伐	856.77	㎡	31'	以上 (前)
養生工	28.98	㎡		
養生シート工	31.50	㎡		



Monitoring points visualize the radiation levels. The radiation maps are created with kriging method by ArcMAP.

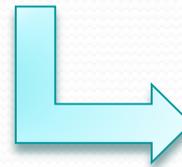


Before the decontamination

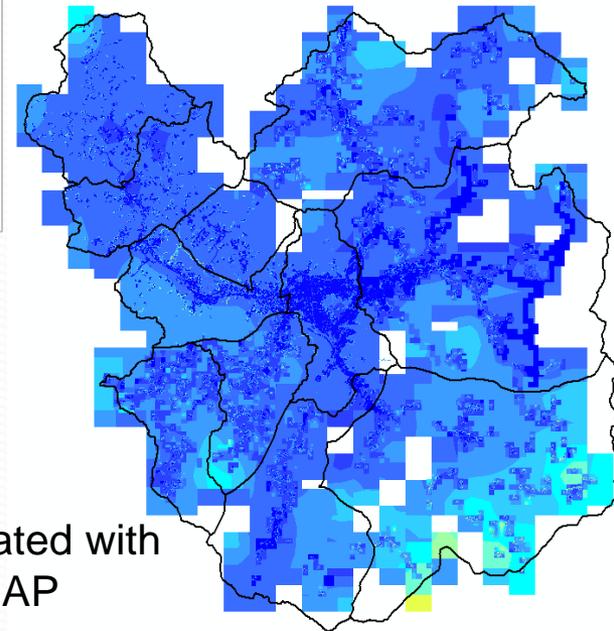
After the decontamination

<Point data>

79,907 points were measured,
1m above the grand surface.



Radiation map was created with
kriging method by ArcMAP



“GIS AlandisNeo” provide following information to local government officers precisely and quickly.

- The decontaminated area.
- Radiation levels from the past to present.
- The distribution of “hot spots”.
- Photos of operations.
- The reports which they sent to inhabitants in the past.
- Other reports which they made in the project.



GIS supports the project in several scenes of management.

considering the priority of following monitoring.

avoiding omissions.

making progress reports to related agencies, ex. national government.

replying to inquiries from inhabitants.

Outline:

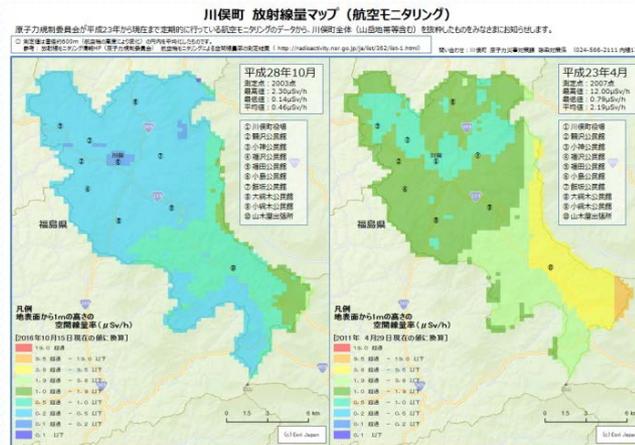
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In order to secure safety and reliability of inhabitants, Kawamata town provides the information at the counters, publishes papers and pamphlets.

These information are based on the accurate data managed on GIS.



Counter reception



Published papers(radiation maps)

6年前の東京電力福島第一原子力発電所の事故によって、私たちは放射能汚染という未経験の被害を受けました。町では、放射能の被害による健康被害の恐れや不安を取り除くために、まずは町民等の生活圏の除染事業を行ってまいりましたが、ようやく終了の碑を迎えることができました。

原発事故により、様々な悩みや不安を抱えながら暮らしてこられた中での除染事業では、ご理解をおかけし、また、お力をお借りすることも多々ありましたが、みなさまの深いご理解と大きなご協力のおかげで、事業を円滑に進めることができました。改めて、深く感謝申し上げます。

原子力規制委員会の除染要領は、「限一に除染」であり、引続き事業用のためや登山の対策を進めてまいります。

町の復興は、避難指示解除後のこれらが本番と考えております。避難区域の復興を契機として、子どもたちの未来のために町民や貴方が感じられる川俣町の発展へとつなげてまいります。

佐藤 全正
 平成28年3月
 町長

お問い合わせ
川俣町役場
 〒980-1492 福島県伊達郡川俣町字宮谷30
 受付時間：午前8時30分～午後5時15分
 受付：上層（総務課、環境・防災・まちづくり課）
 相談窓口：2階（原子力対策課） 放射能対策課
 電話：024-566-2111（代表）
 F.A.：024-566-2438

ホームページアドレス
<http://www.town.kawamata.lg.jp/>

川俣町 除染対策事業のあらまし

【新報】川俣町 原子力対策課長 佐藤全正（平成28年3月）

● 道路の洗浄・ブラッシング
 ● 道路のふき取り
 ● 樹木のふき取り
 ● 土の入れ替え
 ● 舗装面の高圧洗浄

● ガードレール等の拭き取り
 ● 道路法面の除草
 ● 舗装面の高圧洗浄
 ● 舗装の土砂入れ、清掃

● 道路の洗浄・ブラッシング
 ● 道路のふき取り
 ● 樹木のふき取り
 ● 土の入れ替え
 ● 舗装面の高圧洗浄

● 林道の打掃
 ● 林道の除草
 ● 刈り払い、草刈後の除去

川俣町



Pamphlet sent to inhabitants in 2017

※About the case of Kawamata town, we got permission for using from the mayor.