

# Experience of D-shuttle in Miyakoji and Suetsugi district

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## As one resident

- I was born and raised in Koriyama located in center of Fukushima Pref.
- I live together with wife and twins born in September 2011.
- My original work is “Diagnostic Radiologist”.
- I am a clinician.
- I am not...
  - a researcher.
  - professional of radiation protection.

# “D-shuttle” developed by AIST, distributed by CHIYODA TECHNOL Co., Japan

- Since Apr 2013
- Personal integral dosimeter
- Gamma detector
- Set of simple body and display unit
- Plug the body on display unit



Display shows total dose of  
entire period and previous day  
(24 hours from 0:00)

AIST:  
National Institute of  
Advanced Industrial  
Science and technology



# D-shuttle records the detailed data

- CSV data can be read by using management unit
  - The data includes hourly dose within the entire period
  - **It is important to be explained by experts**

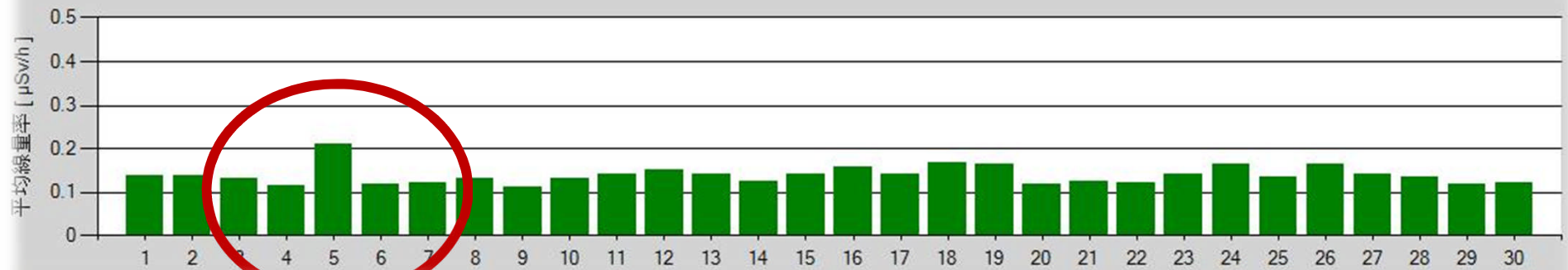


# How to use

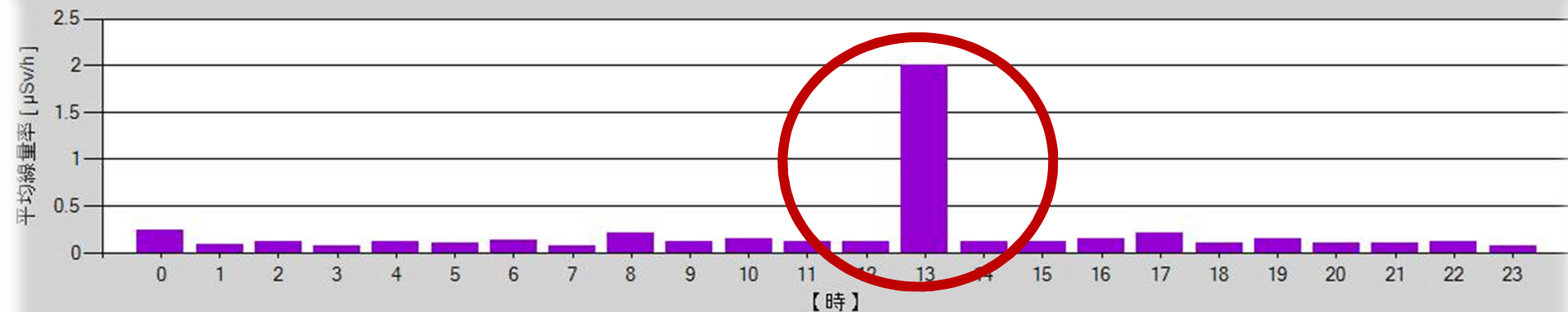
月別線量率の推移

0.5  
0.4  
0.3  
[ $\mu\text{Sv/h}$ ]

2013年 9月 線量率の推移



2013年 9月 5日 線量率の推移



登録者名 : 登録情報なし  
 ID番号 :  
 総被ばく線量 : 0.153 mSv  
 積算日数 : 71 日  
 平均線量率 : 0.09  $\mu$ Sv/h

ID number 3B0 ...

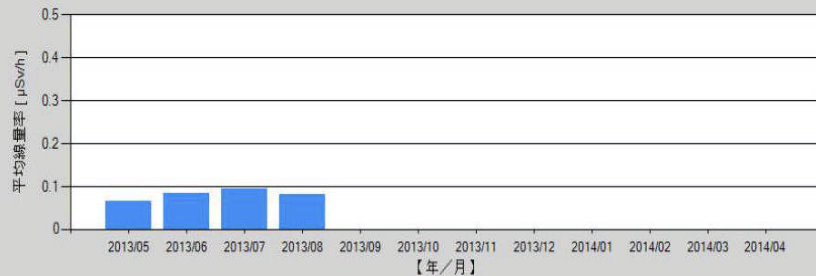
Total dose 0.153 mSv

Possession period 71 day

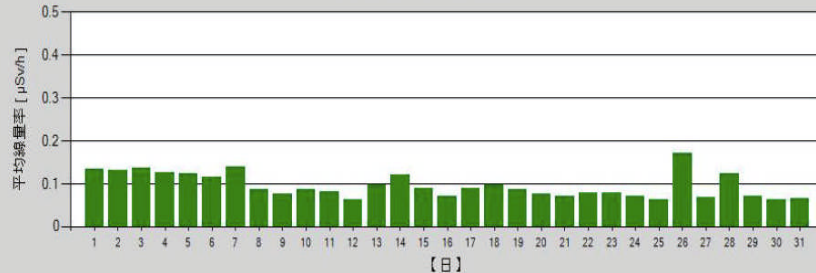
Average dose 0.09  $\mu$ Sv/h  
per hour

0.153 mSv / 71 days

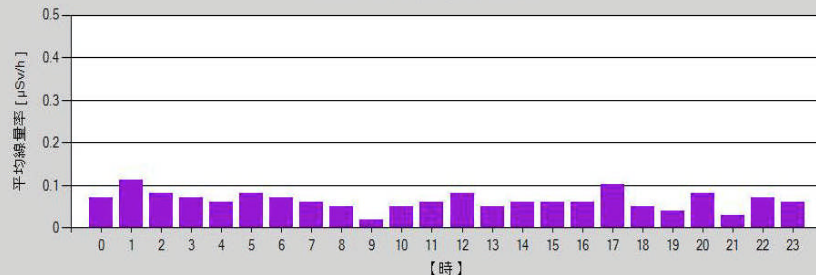
月別線量率の推移



2013年7月線量率の推移



2013年7月31日線量率の推移



Annual Dose per year  
 $= 0.153 \div 71 \times 365$  ( day )  
 $= 0.787$  mSv/year

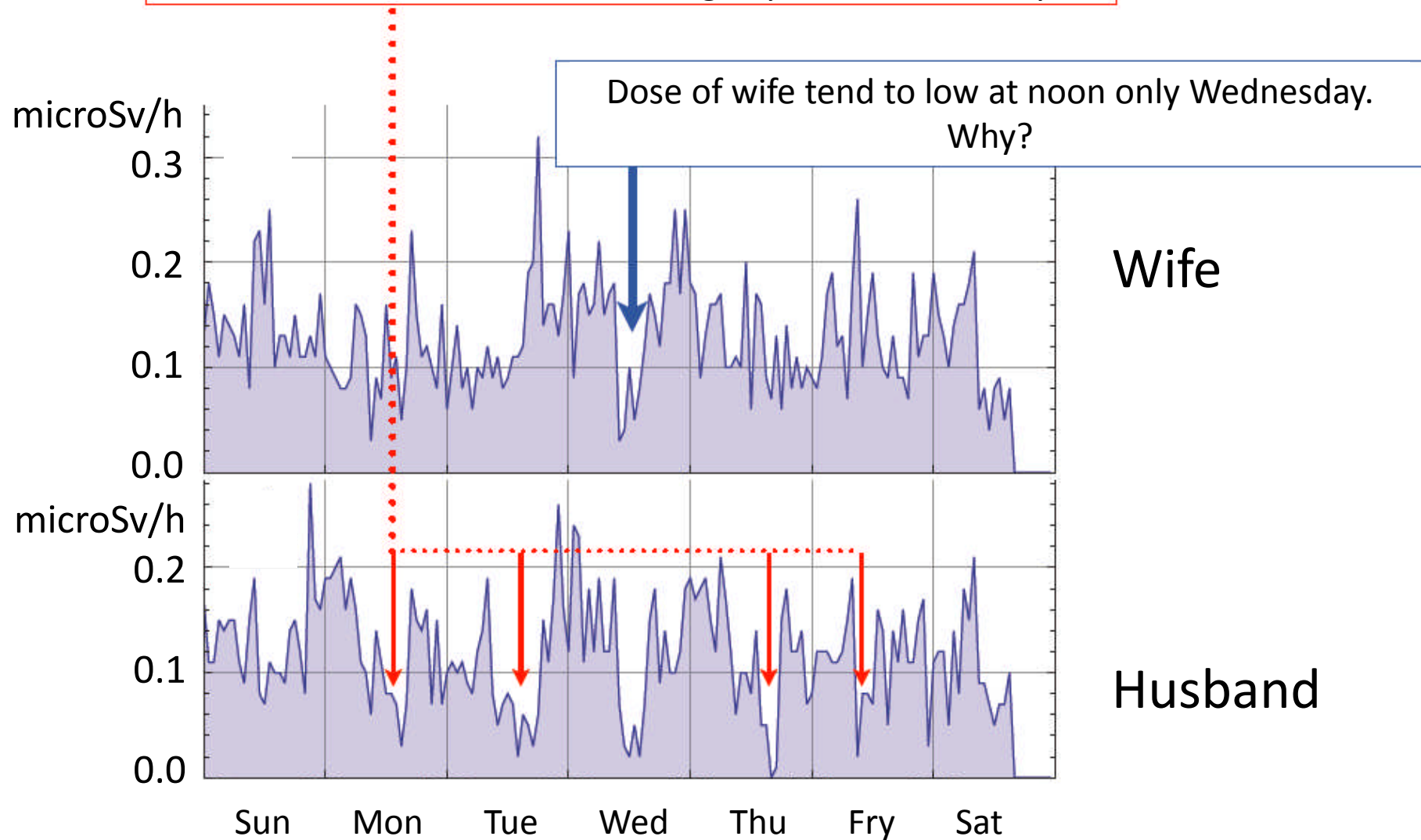
Additional Dose per year  
 $= 0.787 - 0.540$   
 $= 0.247$  mSv/year

\*0.54 mSv/y =

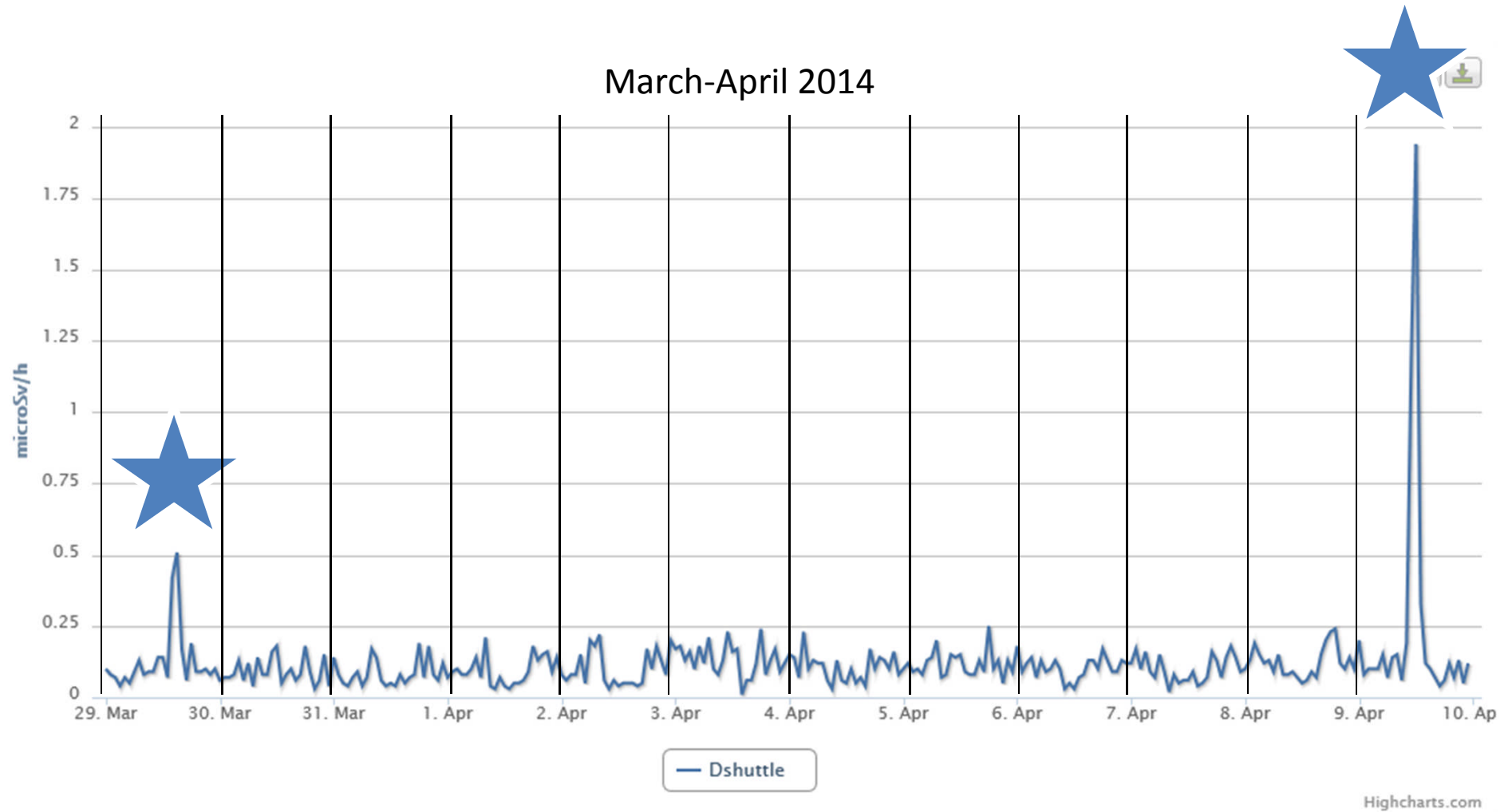
Japanese average natural individual external dose

# For example: data of the certain couple

Dose of husband tend to low during day time on weekdays.



# Importance of having own data

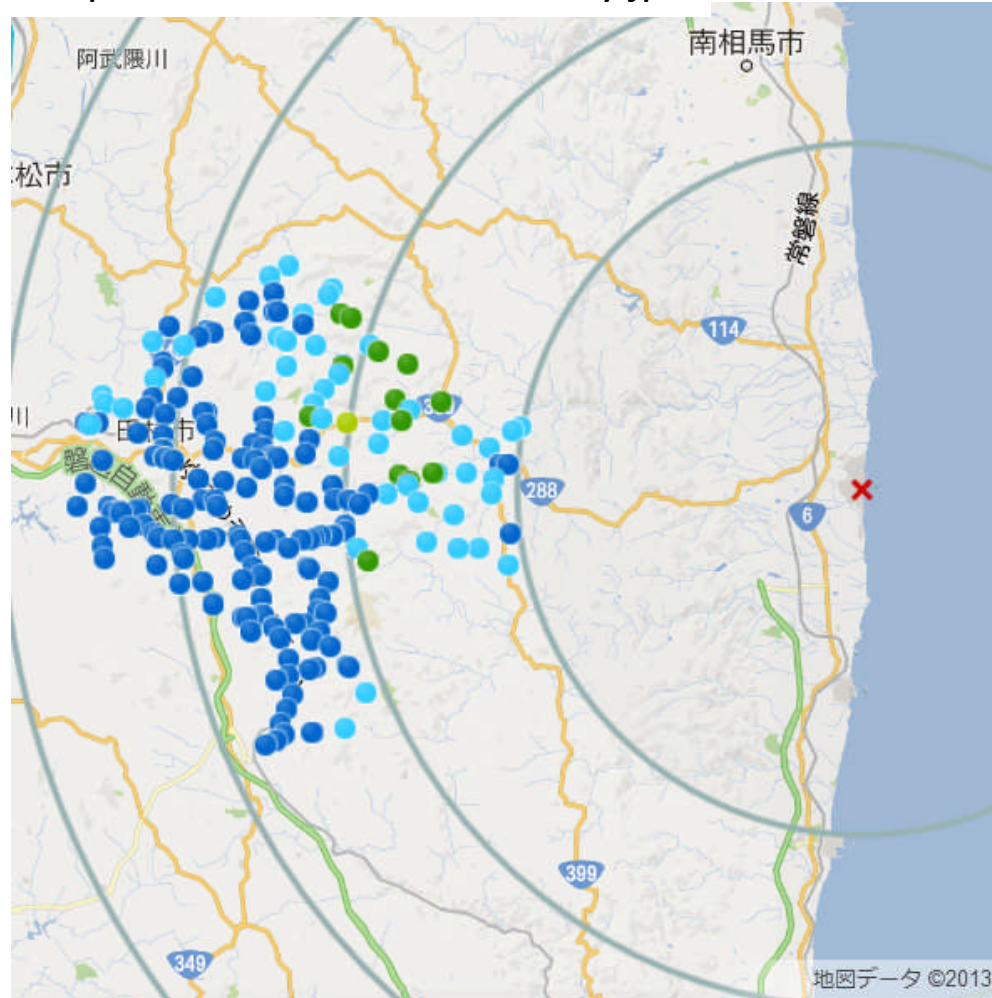




- Behavior changes the dose
- D-shuttle provides reliable information

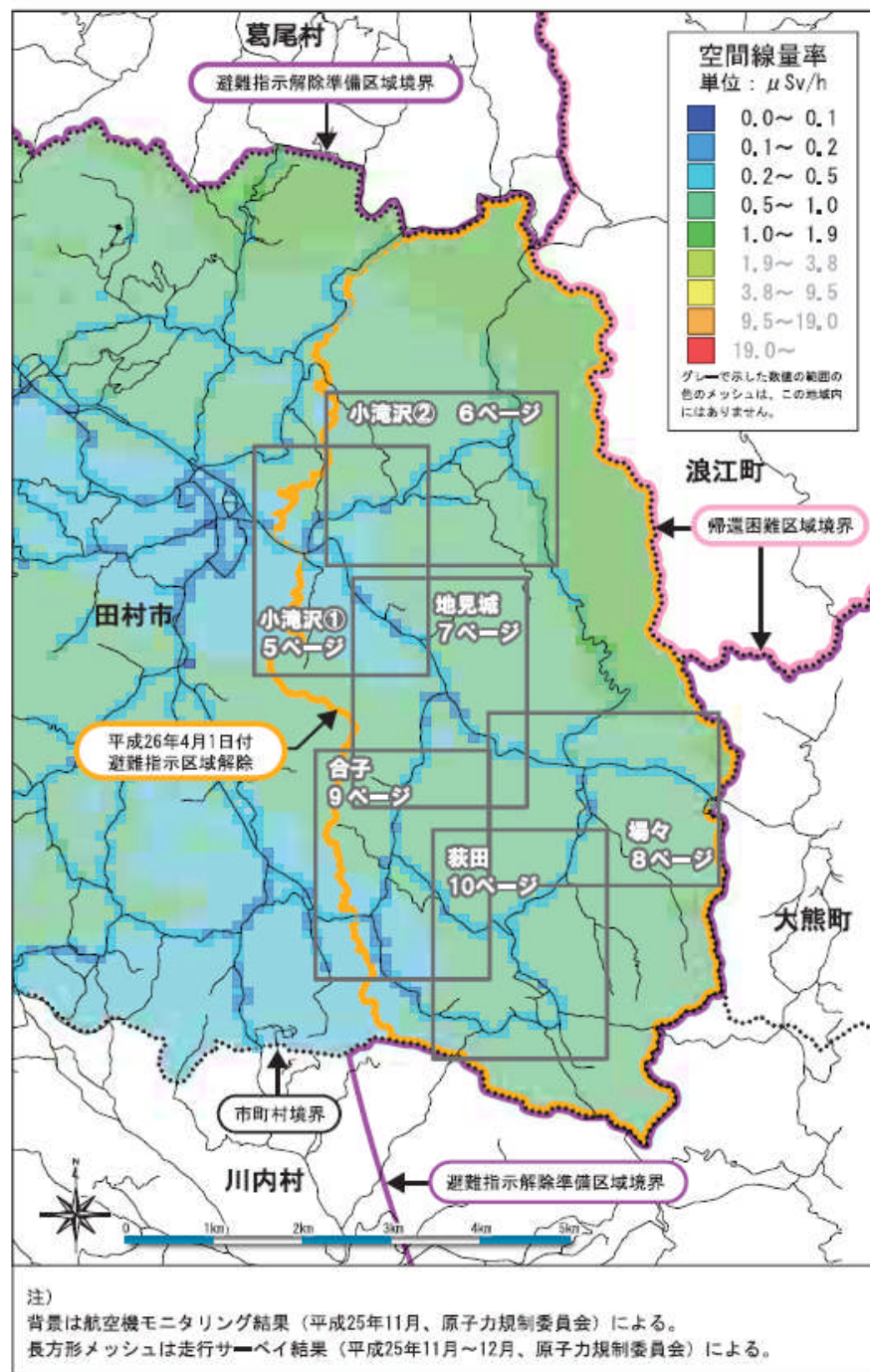
# Miyakoji district, Tamura city

<http://fukushima-radioactivity.jp/>



言語選択  
Select Language 日本語 ▼ 単位:  $\mu\text{Sv/h}$   
Unit ~0.25 ~0.50 ~1.00 ~2.00 ~3.00

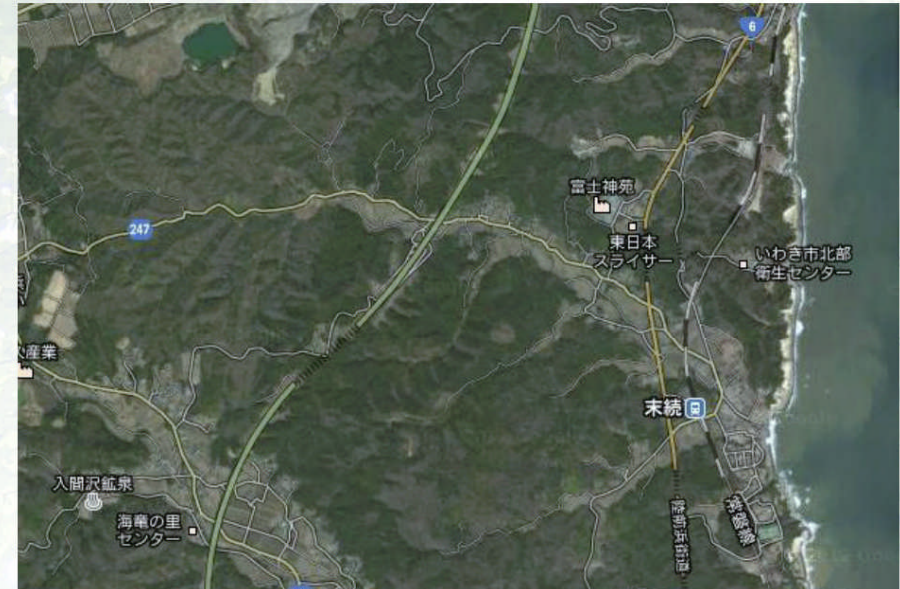
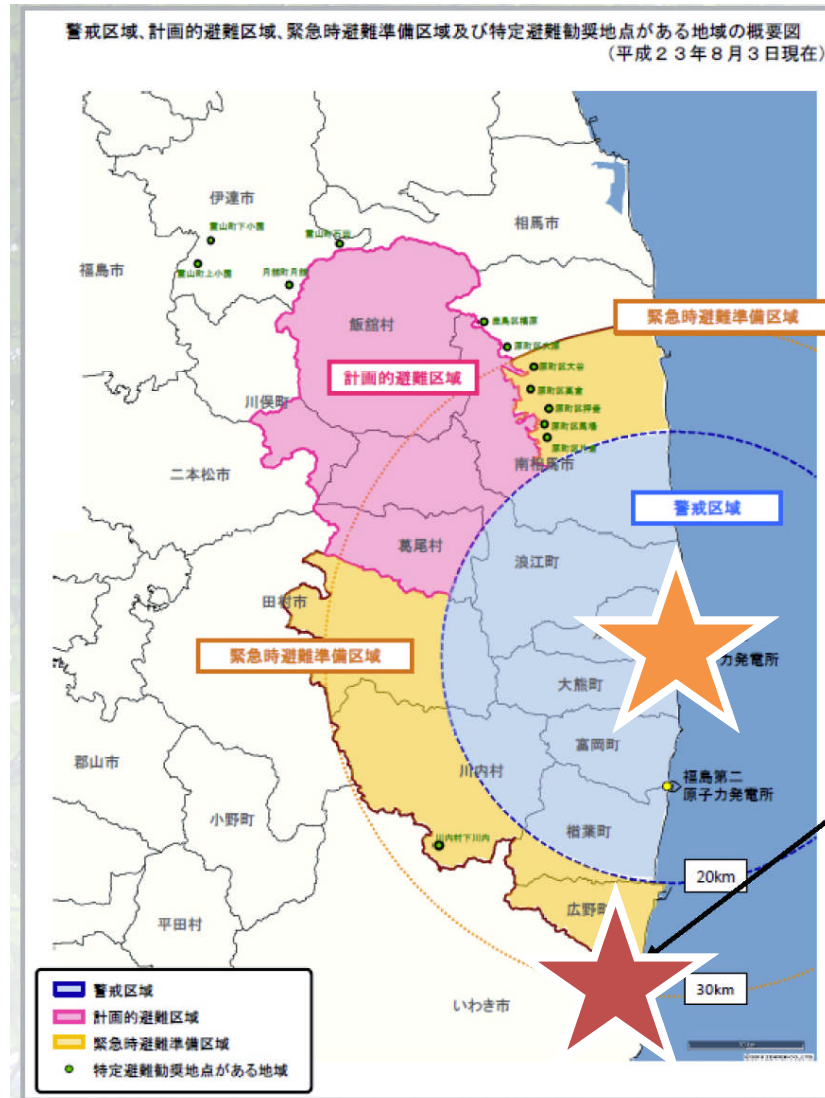




<http://radioactivity.nsr.go.jp/ja/contents/10000/9853/view.html>



# Suetsugi district, Iwaki city



- Located in the northernmost part of Iwaki city
- 27 – 28 km south of Fukushima Dai-ichi NPP
- 130 household, 500 people (before earthquake)

Quote from the presentation slides of Shinya Endo in 5<sup>th</sup> ICRP dialogue seminar

# From my experience

- Residents received more than 1 mSv of additional annual dose was very limited in actual measurement at Miyakoji and Suetsugi.
  - 測定に関与した2地域では、年間追加線量として実測で 1 mSvを超える住民はごく少数であった。
- The cause of high daily dose can be explained by hourly dose data in most cases. Dialogue between resident and expert is very important to understand the reason of high dose.
  - 線量が高めになる原因は多くの場合1時間データから明らかである。  
住民と専門家の対話は原因をお互いに納得するために重要である。
- There are potentially many people exceeding 1 mSv/a in another district. In these cases, administration should be prepared for dose reduction in addition to dialogue.
  - 他の地域では年間追加線量が1 mSvを超える方が多いかもしれない。

# Two crucial roles of D-shuttle

- For experts, D-shuttle enhances communication with residents.
  - 専門家にとっては、住民と対話するきっかけを作るコミュニケーションツールとなる。
- For residents, D-shuttle provides reliable information to clarify the radiation situation in their daily life.
  - 住民にとっては、自分の生活範囲がどのような放射線状況であるかがわかり、よりよく生きるための情報を与えてくれるツールとなる。