



activities of IWG are focused primarily at evaluating:

the predictive capability of environmental models,

in relation to assessing the thyroid exposure due to

radioiodine ^{131}I via inhalation and ingestion pathways

main targets of IWG

check models applicability to

evaluating the effectiveness of countermeasures

Countermeasures:

- ***iodine prophylaxis***
- ***limitation of fresh milk consumption***
- ***restriction of cows pasturing***



main targets of IWG

check models performance in the assessment of ^{131}I doses in situations where of ^{137}Cs deposition have been used as the basis for ^{131}I concentration in air and fallout reconstruction

additional aspect of IWG activity

The credible assessment of radiation doses to the thyroid in areas affected by the release of radioiodine is important:

- **in the short term after a release**
for providing confirmation that special medical aid to the affected population and measures of social protection is required
- **in the longer term after a release**
to provide basis for epidemiological studies and for informing the public of the impact of the release



the IWG activities are focused on:

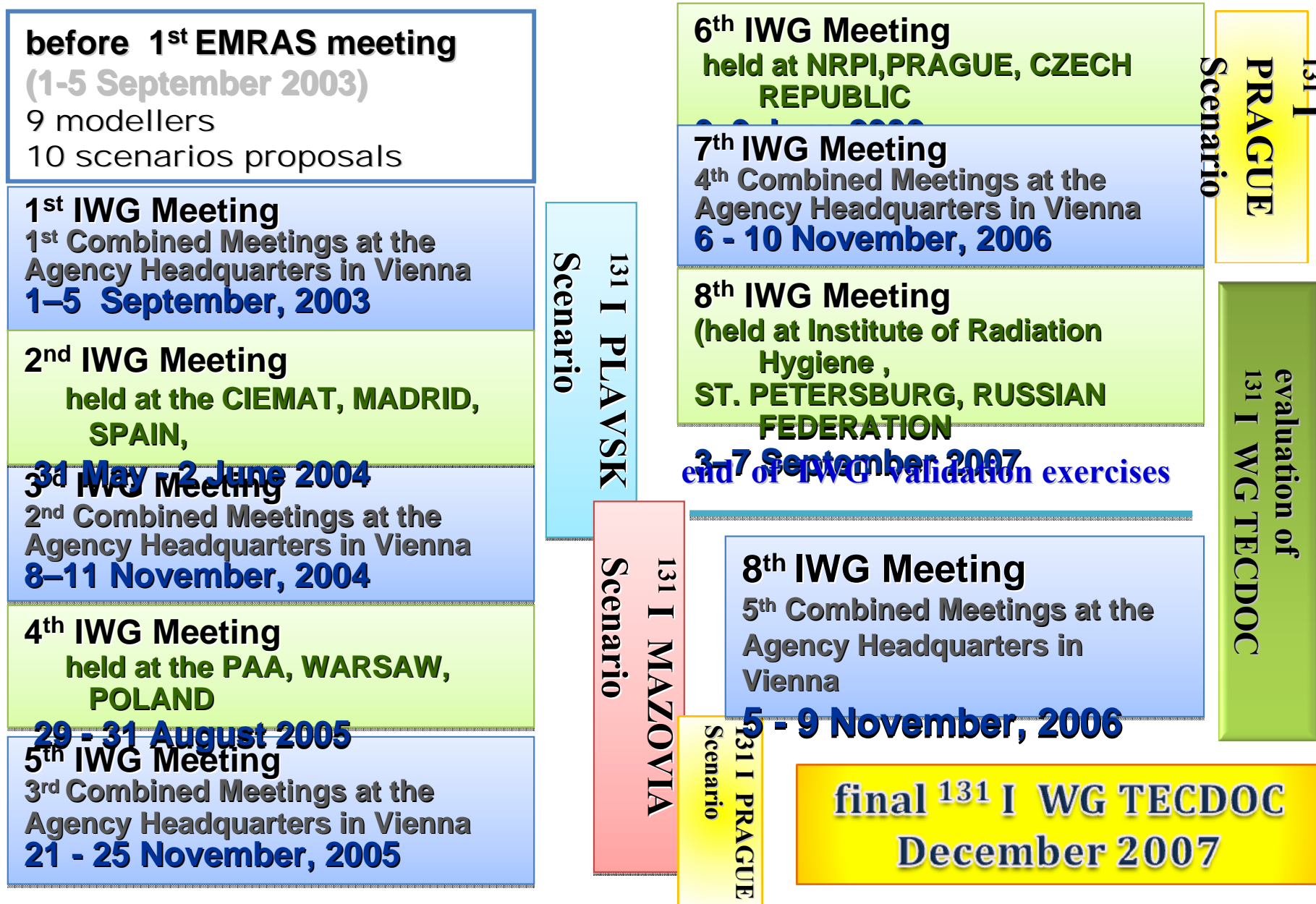
- 1. collection of measurement data sets*
- 2. quality checking of data for use in the modeling and evaluation of appropriate scenarios for model validation purposes*
- 3. comparison of model outputs with independent data sets, including „blind testing” (without disclosing observed data) ,*
- 4. assessement of discrepancies in predictions and identification of the most important sources of bias and uncertainty.*



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8	SPADE V.4.6	Mr D. Webbe-Wood (New) PLAVSK	UK	Food Standard Agency
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milestones





**in the period 2003 – 2007
three scenarios have been evaluated**

^{131}I PLAVSK Scenario (Chernobyl)

^{131}I WARSAW Scenario (Chernobyl)

^{131}I PRAGUE Scenario (Chernobyl)



Central Laboratory for
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(CLOR)

Iodine-131 Working Group 3

**5th Combined Meeting of the IAEA's Programme on
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IAEA Headquarters, Vienna, 5–9 November 2007**

7



**The Chernobyl I-131 release:
model validation and assessment of the
countermeasure effectiveness**

*Report of the Working Group on Chernobyl I-131
release of EMRAS Theme 1*

Environmental Modelling for Radiation Safety

EMRAS

programme

October 2007



Contents

FOREWORD	2
ACKNOWLEDGEMENT	3
1. INTRODUCTION	7
1.1 BACKGROUND	7
1.2 OBJECTIVES	8
1.3 SCOPE OF THIS REPORT	9
1.3.1 SCENARIO PLAVSK	11
1.3.2 SCENARIO MAZOVIA	11
1.3.3 SCENARIO PRAGUE	12
1.4 STRUCTURE	13
2 SCENARIOS DESCRIPTIONS	13
2.1 PLAVSK SCENARIO	13
2.1.1 Purpose	13
2.1.2 Scenario descriptions	13
2.1.3 Assessment tasks	16
2.1.4 Participants and models	18
2.2 MAZOVIA SCENARIO	23
2.2.1 Purpose	23
2.2.2 Scenario descriptions	23
2.2.3 Assessment tasks	25
2.2.4 Participants and models	30
2.3 PRAGUE SCENARIO	35
2.3.1 Purpose	35
2.3.2 Scenario descriptions	35
2.3.3 Assessment tasks	35
2.3.4 Participants and models	35
3 MODEL DESCRIPTIONS	36
3.1 ECOSYS-87 (M. Ammand)	36
3.2 ASTRAL (C. Duffe) – not comp	36
3.3 LIETDOS (V. Flisovicz, T. Nedveckaite)	36
3.4 OSCAAR (T. Homma)	36
3.5 TAM-DYNAMIC (B. Kenyar)	36
3.6 CLRP (P. Krajewski)	43
3.7 Plavsk Dose Calculator (S. Simon)	43
3.8 CLIMRAD (O. Vlasov)	43
3.9 SPADE V.6 (D. Webbe-Wood)	43
3.10 IRH-model (I. Zvonova)	43



4	RESULTS AND DISCUSSION.....	43
4.1	PLAVSK SCENARIO.....	43
4.1.1	Evaluation of ¹³¹ I deposition (isotopic ratio ¹³¹ I/ ¹³⁷ Cs).....	43
4.1.2	¹³¹ I concentration in grass.....	49
4.1.3	¹³¹ I concentration in milk.....	53
4.1.4	¹³¹ I thyroid content.....	67
4.1.5	¹³¹ I thyroid burden from inhalation.....	70
4.1.6	¹³¹ I burden of new born.....	71
4.1.7	Comparison of observed and predicted ¹³¹ I contents in thyroid.....	72
4.1.8	Reconstruction of ¹³¹ I concentration in air for Plavsk Scenario.....	74
4.1.9	Dose assessment.....	77
4.1.10	Concluding remarks.....	78
4.2	MAZOVIA SCENARIO.....	80
4.2.1	¹³¹ I concentration in grass.....	81
4.2.2	¹³¹ I concentration in milk.....	85
4.2.3	¹³¹ I thyroid content.....	89
4.2.4	Dose assessment.....	104
4.3	PRAGUE SCENARIO.....	107
4.3.1	¹³¹ I concentration in grass.....	107
4.3.2	Concluding remarks.....	107
5	CONCLUSIONS.....	108
6	RECOMMENDATIONS AND SUGESTIONS FOR FUTURE WORK.....	111
7	REFERENCES.....	112
8	ANNEX I: SCENARIOS.....	114
8.1	PLAVSK SCENARIO.....	114
8.2	MAZOVIA SCENARIO.....	114
8.3	PRAGUE SCENARIO.....	114
9	ANNEX II: PERSONAL EVALUATION OF MODELS PERFORMANCE.....	114
9.1	ECOSYS-87 (M. Ammand).....	114
9.2	ASTRAL (C. Duffa).....	114
9.3	LIETDOS (V. Flistovicz, T. Nedveckaite).....	114
9.4	OSCAAR (T. Homma).....	114
9.5	EVALUATION OF THE TAM-DYNAMIC MODEL PREDICTIVE PERFORMANS ON THE BASE OF I-131 PUBLIC EXPOSURE SCENARIO(B. Kenyar).....	114
9.6	CLRP (P. Krajewski).....	114
9.7	Plavsk Dose Calculator (S. Simon).....	114
9.8	CLIMRAD (O. Vlasov).....	114
9.9	SPADE V.6 (D. Webbe-Wood).....	114
9.10	IRH-model (I. Zvonova).....	114
10	ANNEX III: NUMERICAL VALUES OF OBSERVATION.....	115



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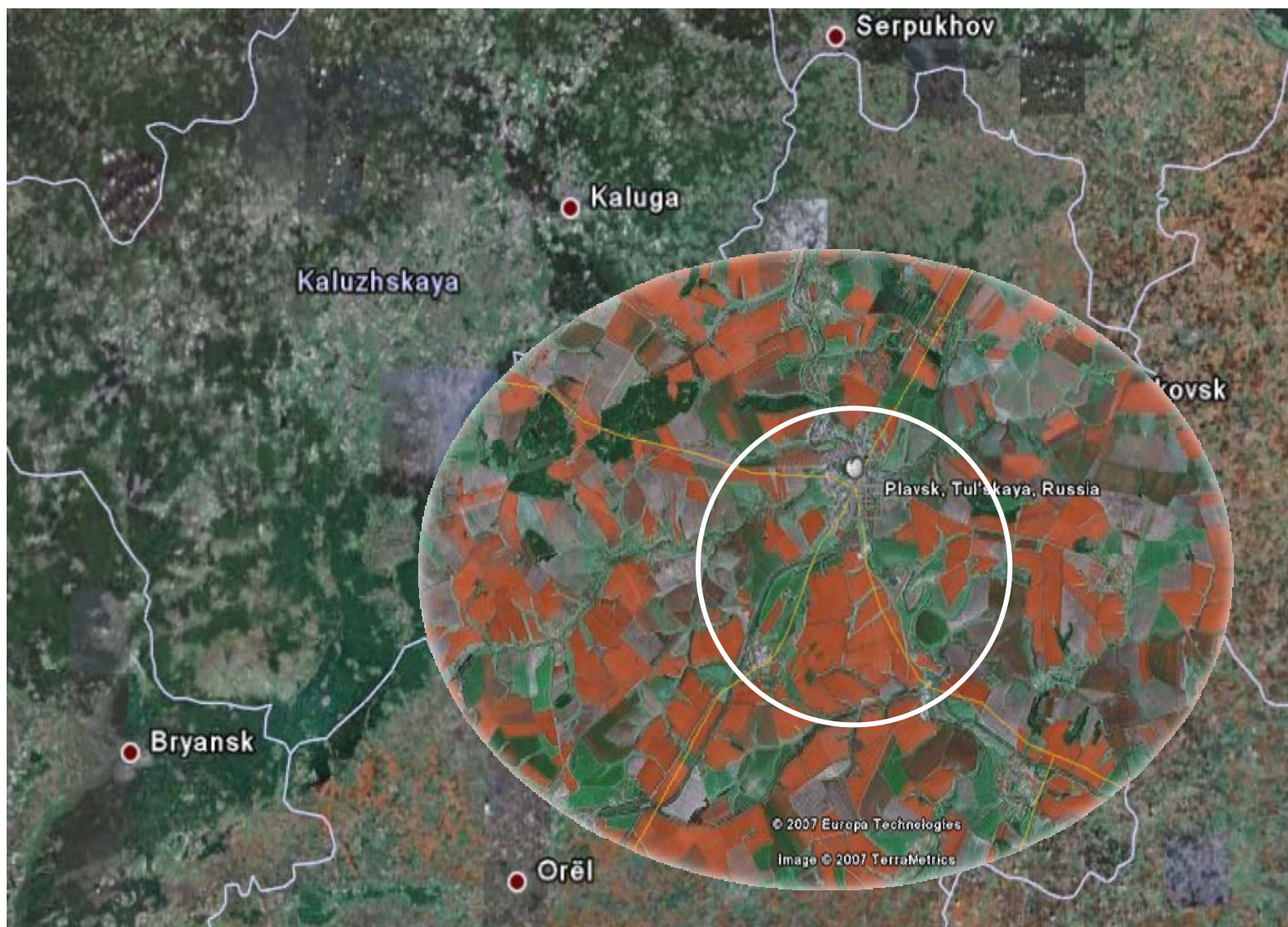
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10



¹³¹I PLAVSK Scenario (Chernobyl)



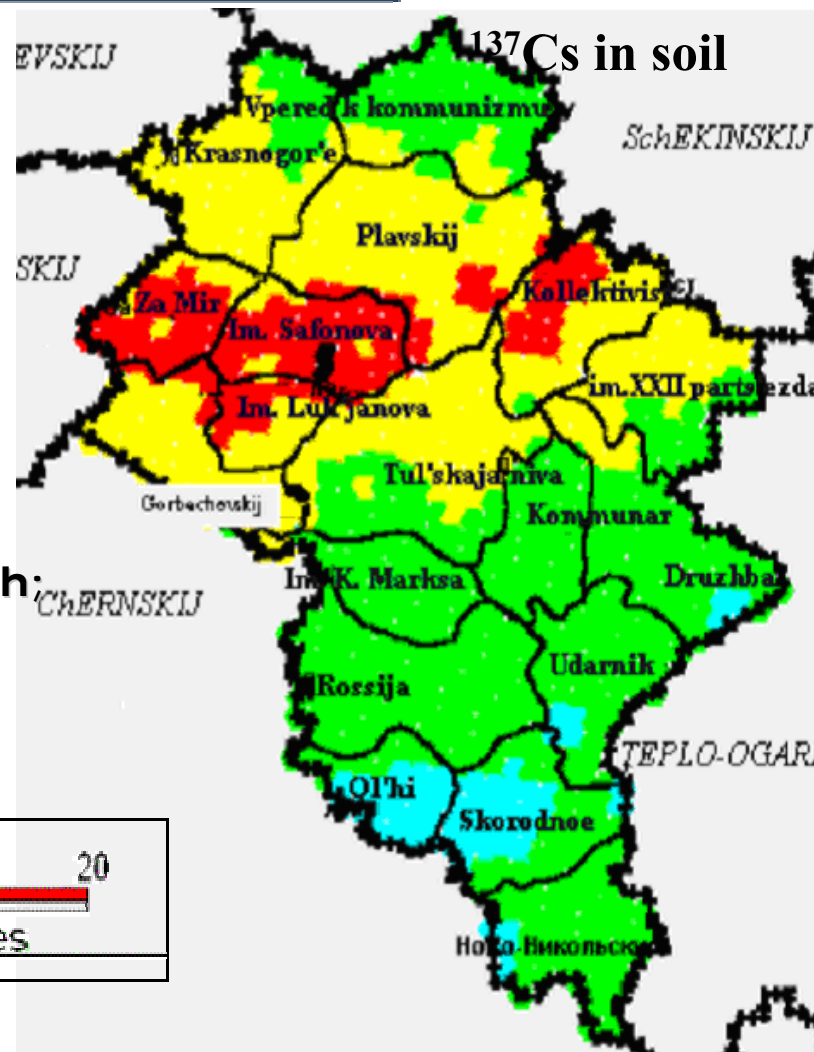
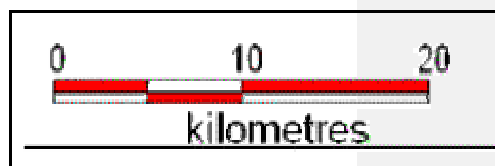


¹³¹I PLAVSK Scenario (Chernobyl)

- 1 Krasnogor'e
- 2 Za Mir
- 3 Im. Safonova
- 4 Plavskij
- 5 Vpered k kommunizmu
- 6 Im. Luk'janova
- 7 Gorbachevskij
- 8 Tul'skaja niva
- 9 Im. K. Marksa
- 10 Rossija
- 11 Kollektivist
- 12 Kommunar
- 13 Druzhba
- 14 im.XXII parts'ezda
- 15 Udarnik
- 16 Ol'hi
- 17 Skorodnoe
- 18 Novo Nikol'skij

Area

40 km width;
60 km high



■ >37 kBq/m² ; ■ 37–185 kBq/m²; ■ 185–370 kBq/m²; ■ 370–555 kBq/m²; ■ 555 kBq/m²



¹³¹I PLAVSK Scenario (Chernobyl)

The participants of IWG has been asked to provide uncertainty analysis of thyroid doses when relatively short time of rain during the cloud passage yielded the mixed (dry&wet) and consequently inhomogeneous ¹³⁷Cs deposition and when the time when cows had been put on pasture was not exactly known.



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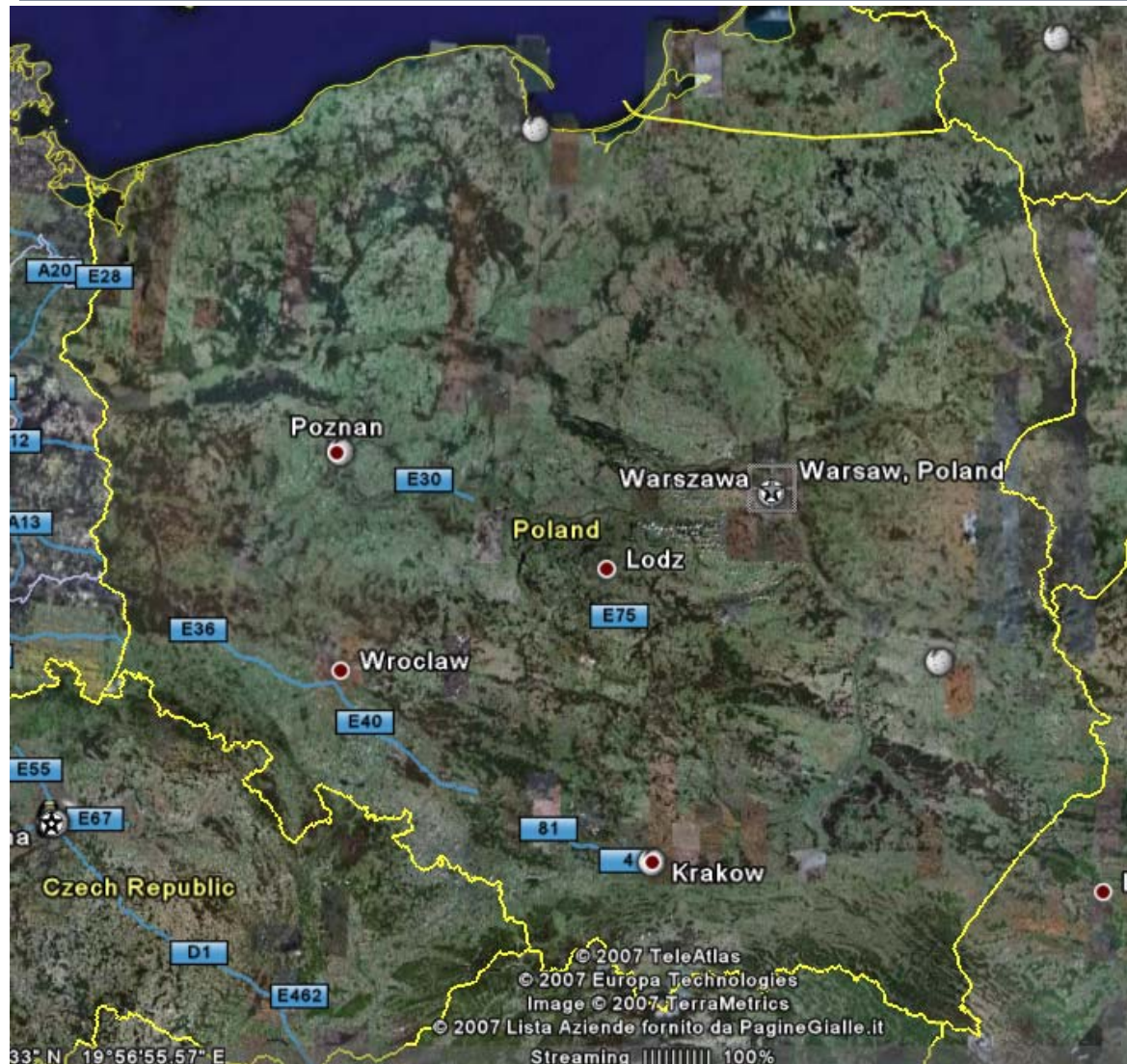
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13



¹³¹I WARSAW Scenario (Chernobyl)





¹³¹I WARSAW Scenario (Chernobyl)

crucial points for model validation!

- ☐ *effectiveness of thyroid blocking!*
- ☐ *inhomogeneous ¹³¹I deposition*

end points considered for model testing:

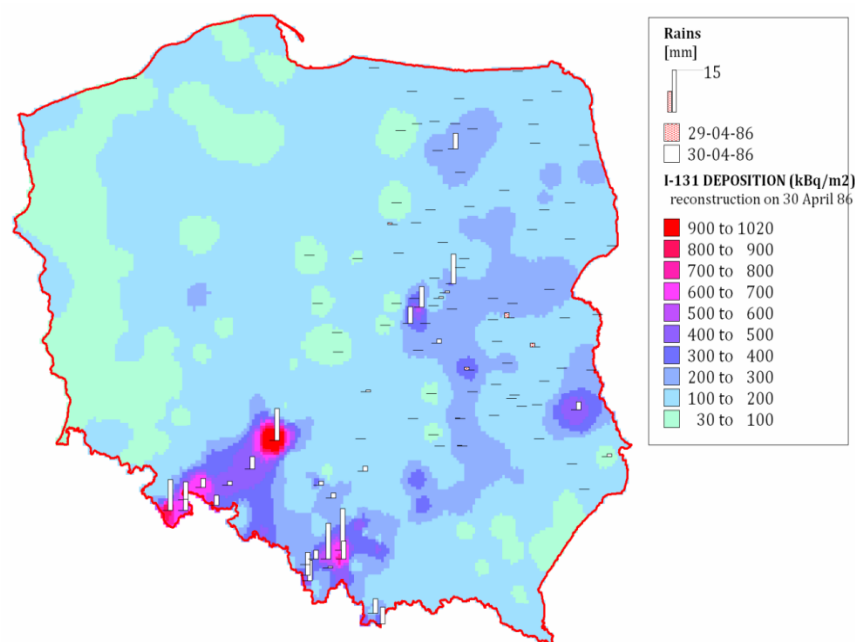
- ☐ *¹³¹I concentration in milk*
- ☐ *¹³¹I thyroid burden for different age groups for two specified location*

effectiveness countermeasures

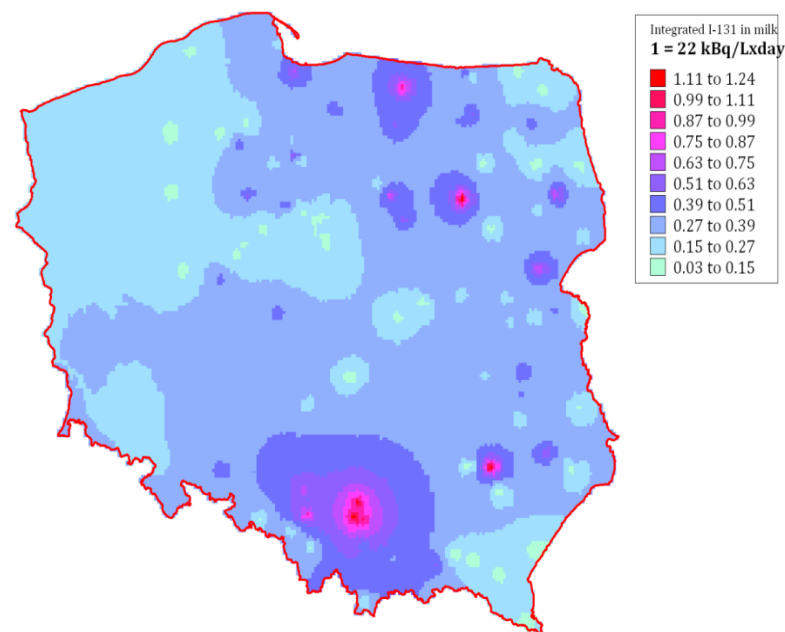
- ☐ *administration of stable iodine solution,*
- ☐ *limitation of fresh milk consumption*
- ☐ *restriction of cows pasturing*



¹³¹I WARSAW Scenario (Chernobyl)



*Reconstruction of ¹³¹I deposition
(calculated on 30 April 1986) from
¹³⁷Cs surface contamination*



*Effect of countermeasures
Spatial distribution of ¹³¹I integrated
concentration in milk averaged with
IDW Shepard interpolator*



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16

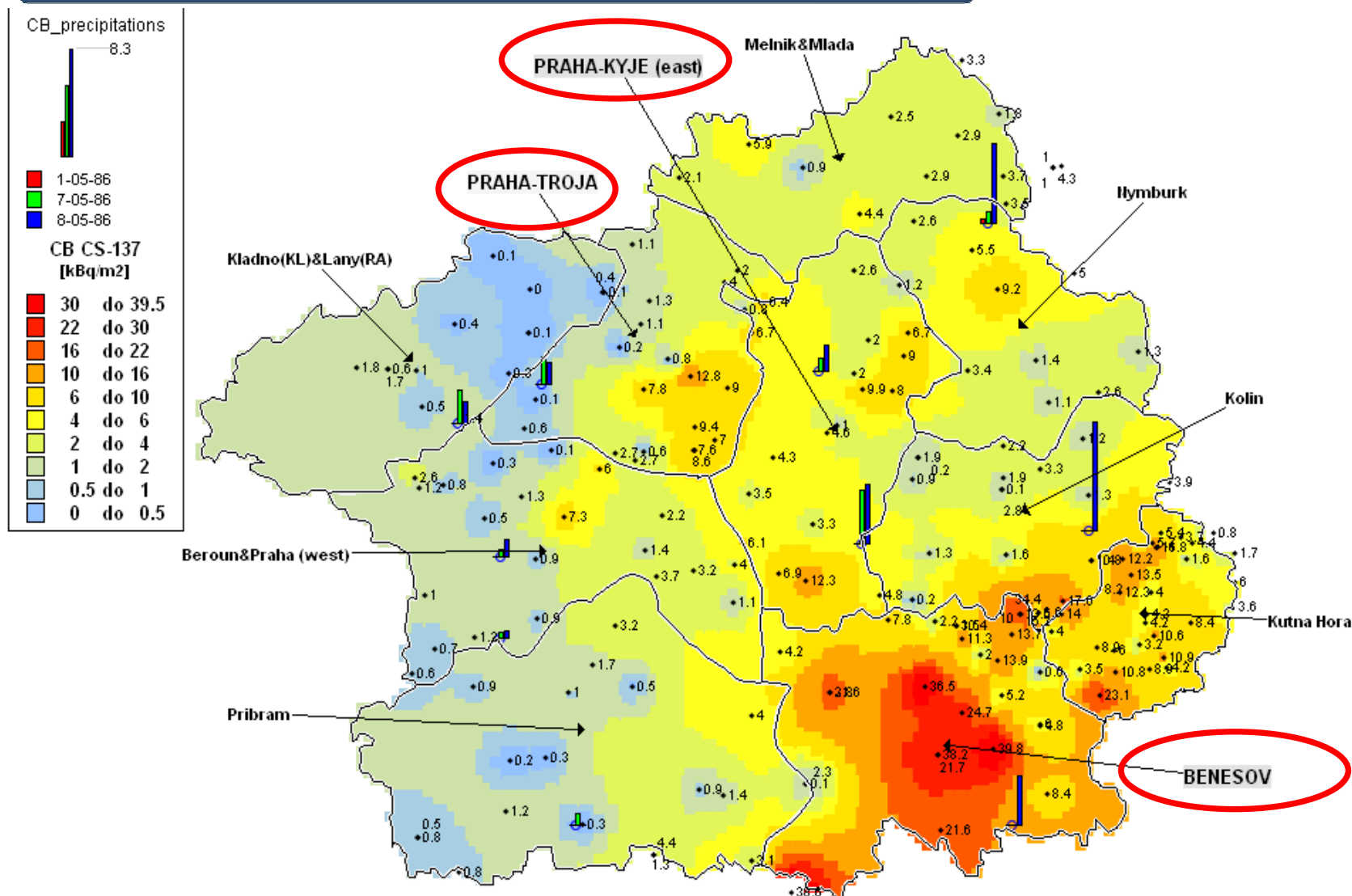


¹³¹I PRAGUE Scenario (Chernobyl)





¹³¹I PRAGUE Scenario (Chernobyl)





^{131}I PRAGUE Scenario (Chernobyl)

The third Prague Scenario has been focused on several aspects of the internal ^{131}I dose evaluation in a case where a special cow feeding regime was applied.

This regime consists in keeping cows in cowsheds and feeding them by silage mixture

In addition, the IWG participants were asked to estimate the ^{131}I concentration in milk for the hypothetical situation in which cows were pastured on open grassland near Prague..



GENERAL CONCLUSIONS

1. *significant improvement in the performance of models compared with previous radioiodine assessment exercises*
2. *more than 60% of predictions of the various models were within a factor of three of the observations of ^{131}I concentration in milk and ^{131}I content of the thyroid*
3. *discrepancies between the estimates of average doses to the thyroid produced by most participants did not exceed a factor of ten.*
4. *however, estimated doses differed by up to two orders of magnitude when the participants attempted to evaluate the effectiveness of applied countermeasures using different methods and conceptual approaches.*



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20



Thanks for your attention

Paweł Krajewski

**Most of the IWG documents are on the html
analogue of ftp server:**

<http://www-ns.iaea.org/downloads/rw/fileshare/wss/default.asp?lg=a&fd=161>