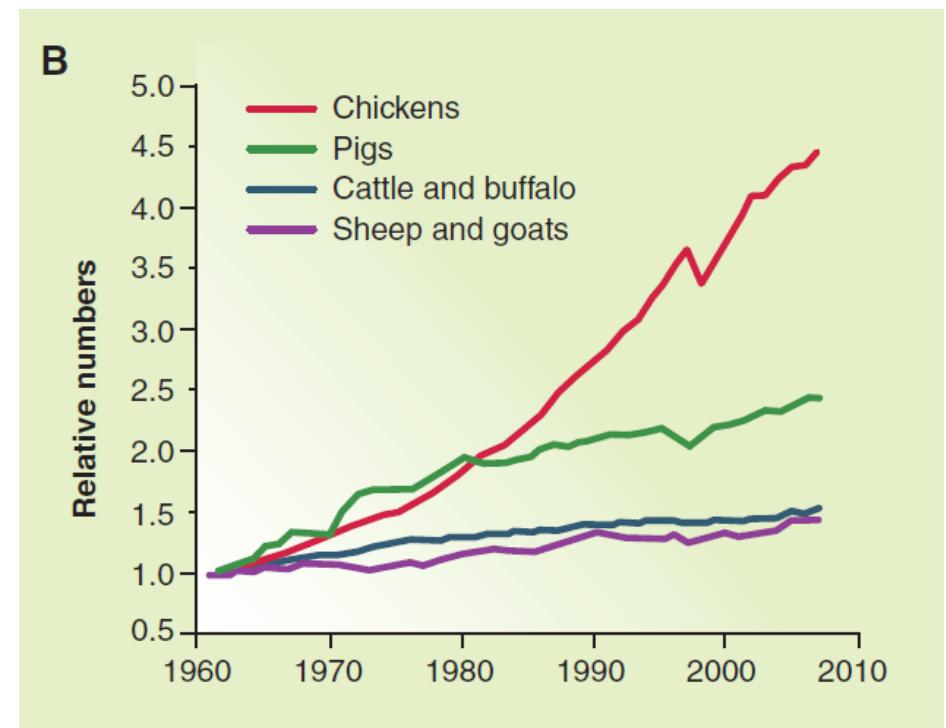
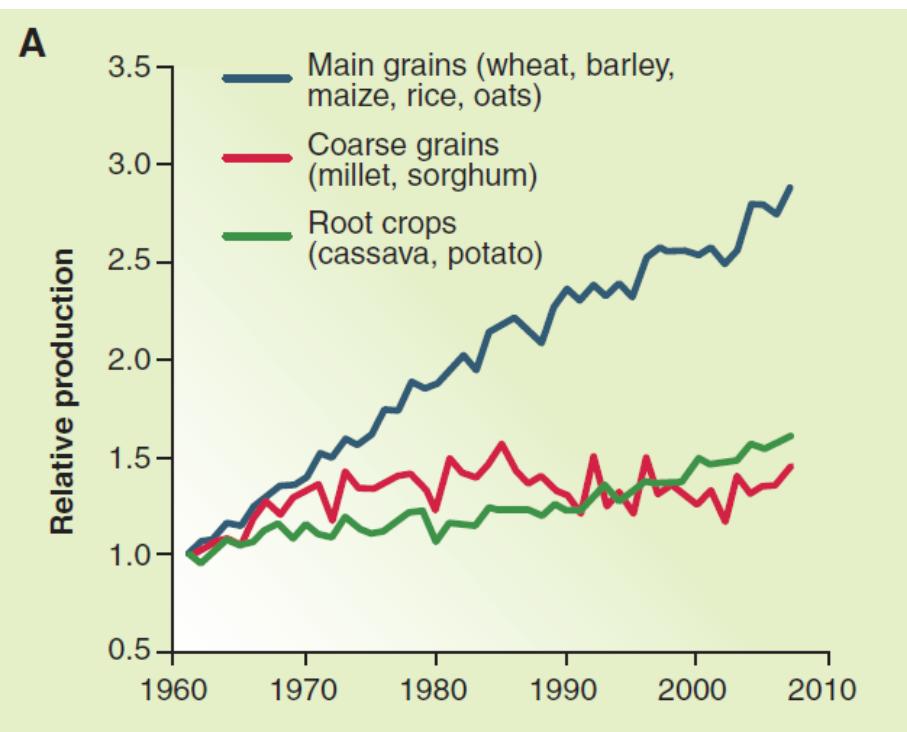

Data and model integration to support decisions for optimal agricultural production under global environment changes

Seishi Ninomiya

Institute of Sustainable Agro-eco Services
Graduate School of Agriculture and Life Sciences
The University of Tokyo



Food production in last 50 years



SCIENCE VOL 327 12 FEBRUARY 2010

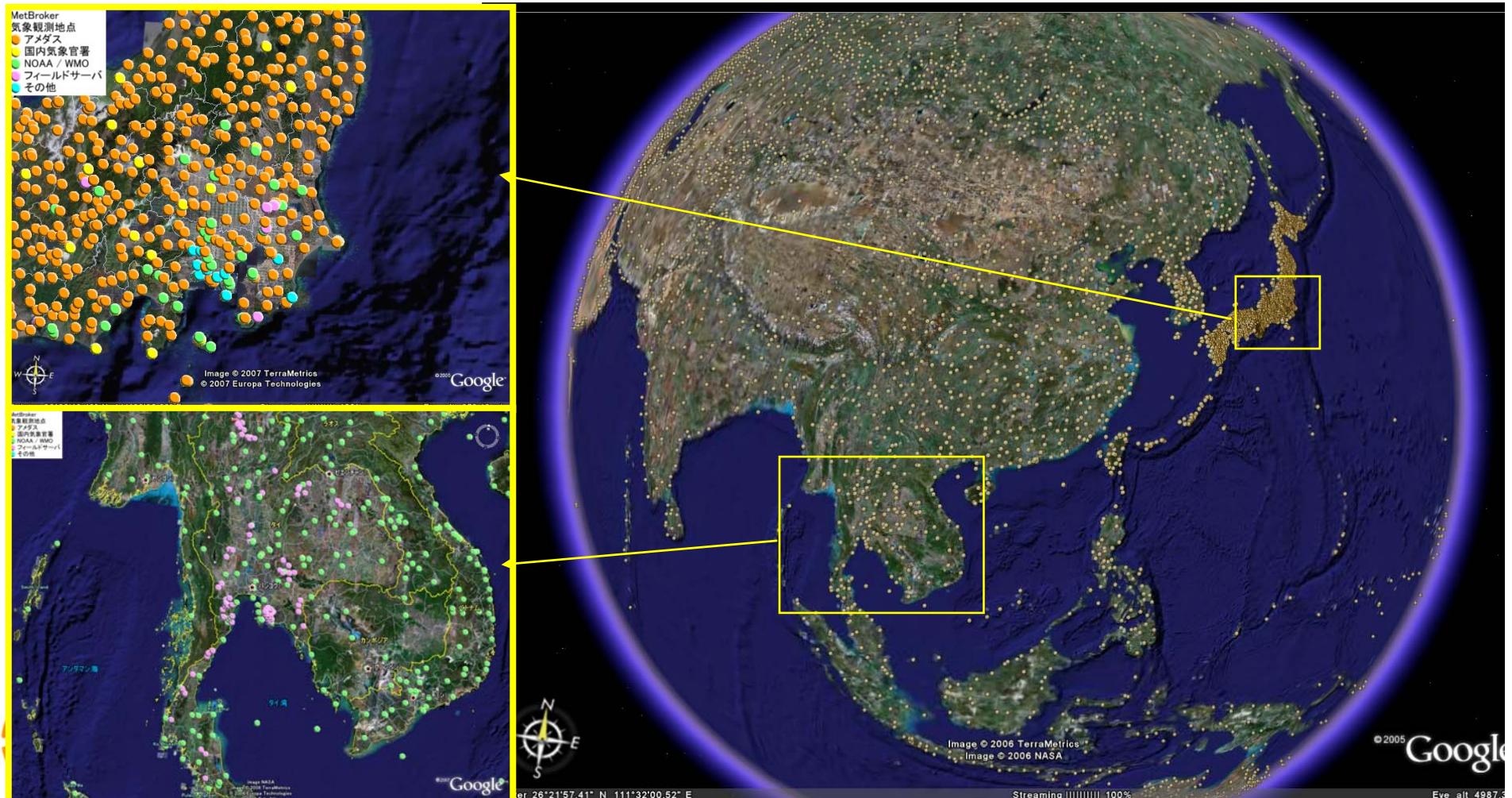
Constraints

- Limitation of chemical use
 - Eco-system damage by chemicals
- No more arable land
- No more water
- Climatic change

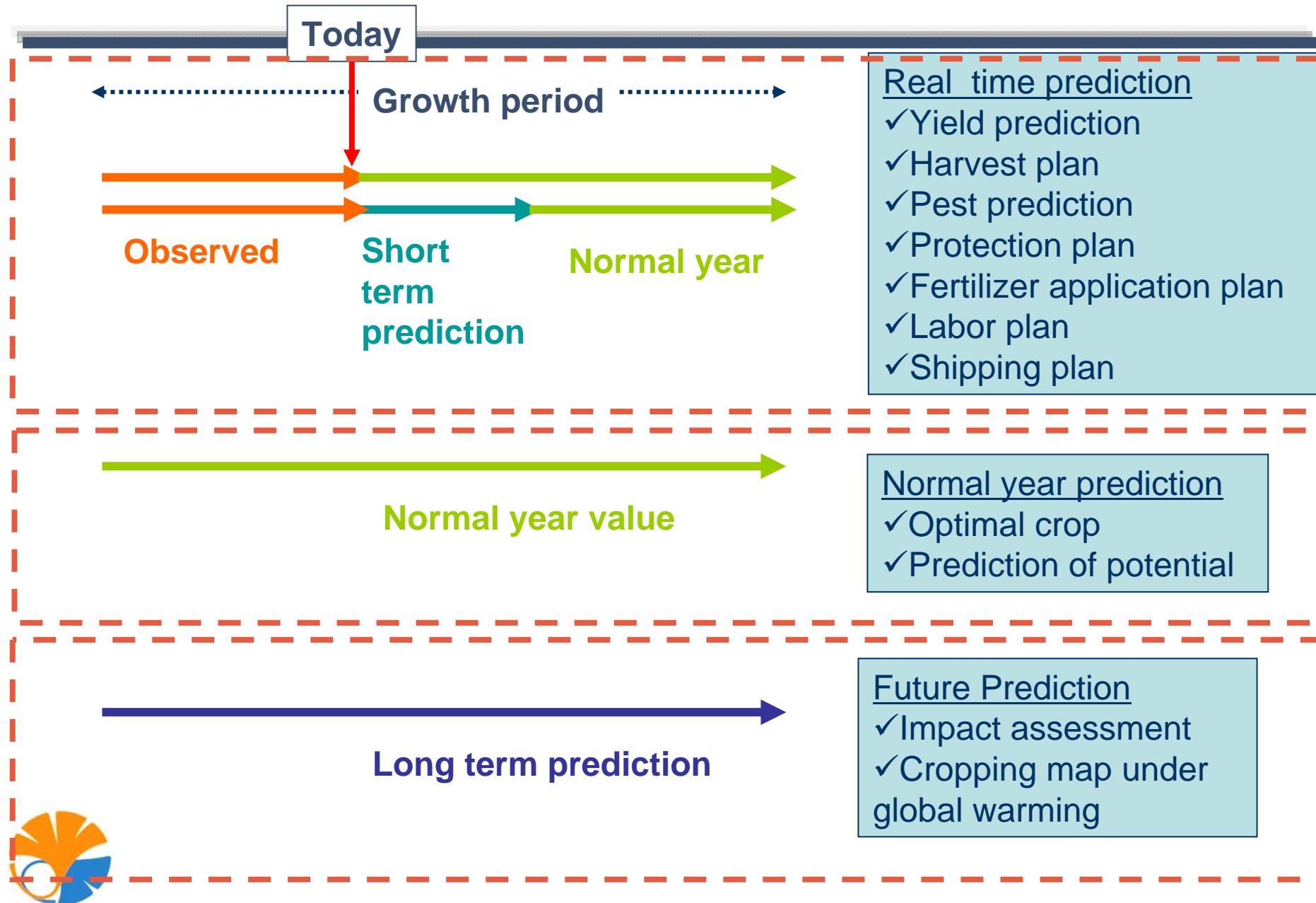


Spatial integration of weather data

- MetBroker provides applications consistent access to heterogeneous weather databases and covers 22,000 weather stations of 25 DBs



Time series integration of weather data



Simulator for Cultivation Possibility of Rice

[Top](#) [Help](#)[Yield for each cultivar](#)[Cultivar in max yield](#)

Cultivar

- Ishikari
- Sasanishiki
- Koshihikari
- Nipponbare
- Mizuho
- IR36
- IR64
- IR58

Incremental temperature

0°C 2°C 4°C

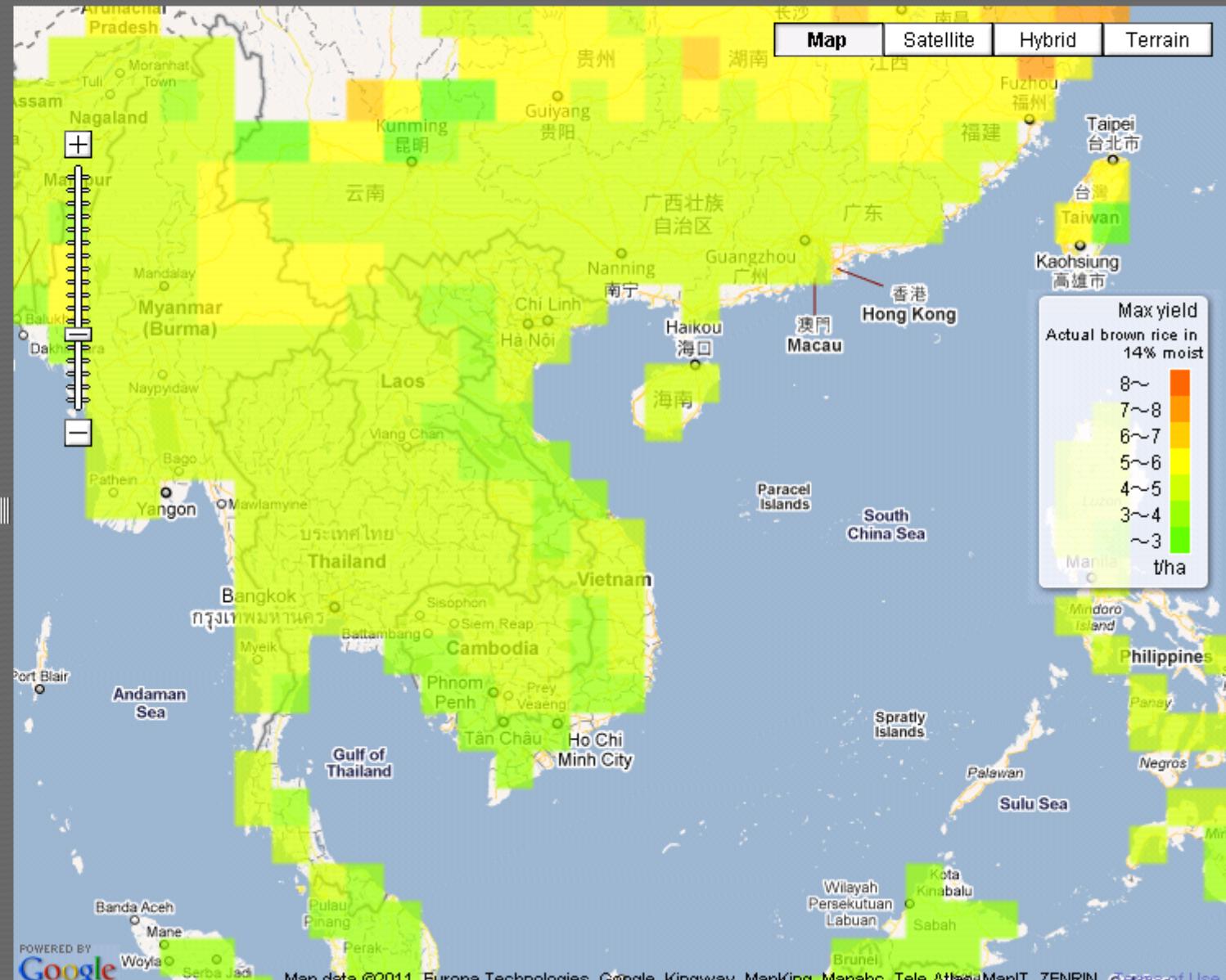
CO₂ concentration

350ppm 525ppm

Download world wide data
(zip file: about 550KB)

[Download](#)

POWERED BY



Simulator for Cultivation Possibility of Rice

[Top](#) [Help](#)

[Yield for each cultivar](#)

[Cultivar in max yield](#)

Cultivar

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- Sasanishiki
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- Mizuho
- IR36
- IR64**
- IR58

Incremental temperature

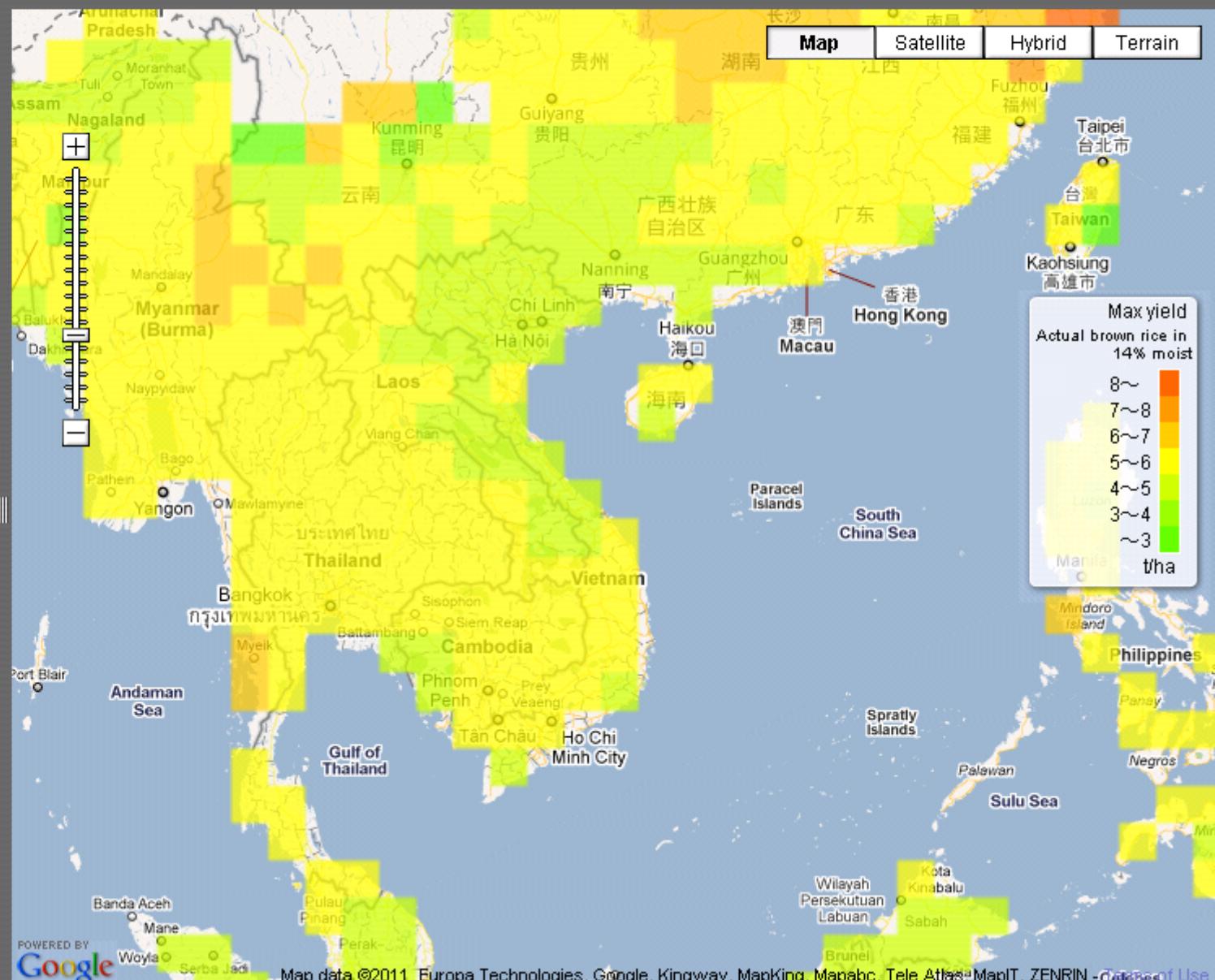
0°C 2°C 4°C

CO₂ concentration

350ppm 525ppm

Download world wide data
(zip file: about
550KB)

[Download](#)



Simulator for Cultivation Possibility of Rice

[Top](#) [Help](#)

Yield for each cultivar

Cultivar in max yield

Cultivar

- Ishikari
- Sasanishiki
- Koshihikari
- Nipponbare
- Mizuho
- IR36
- IR64**
- IR58

Incremental temperature

0°C 2°C 4°C

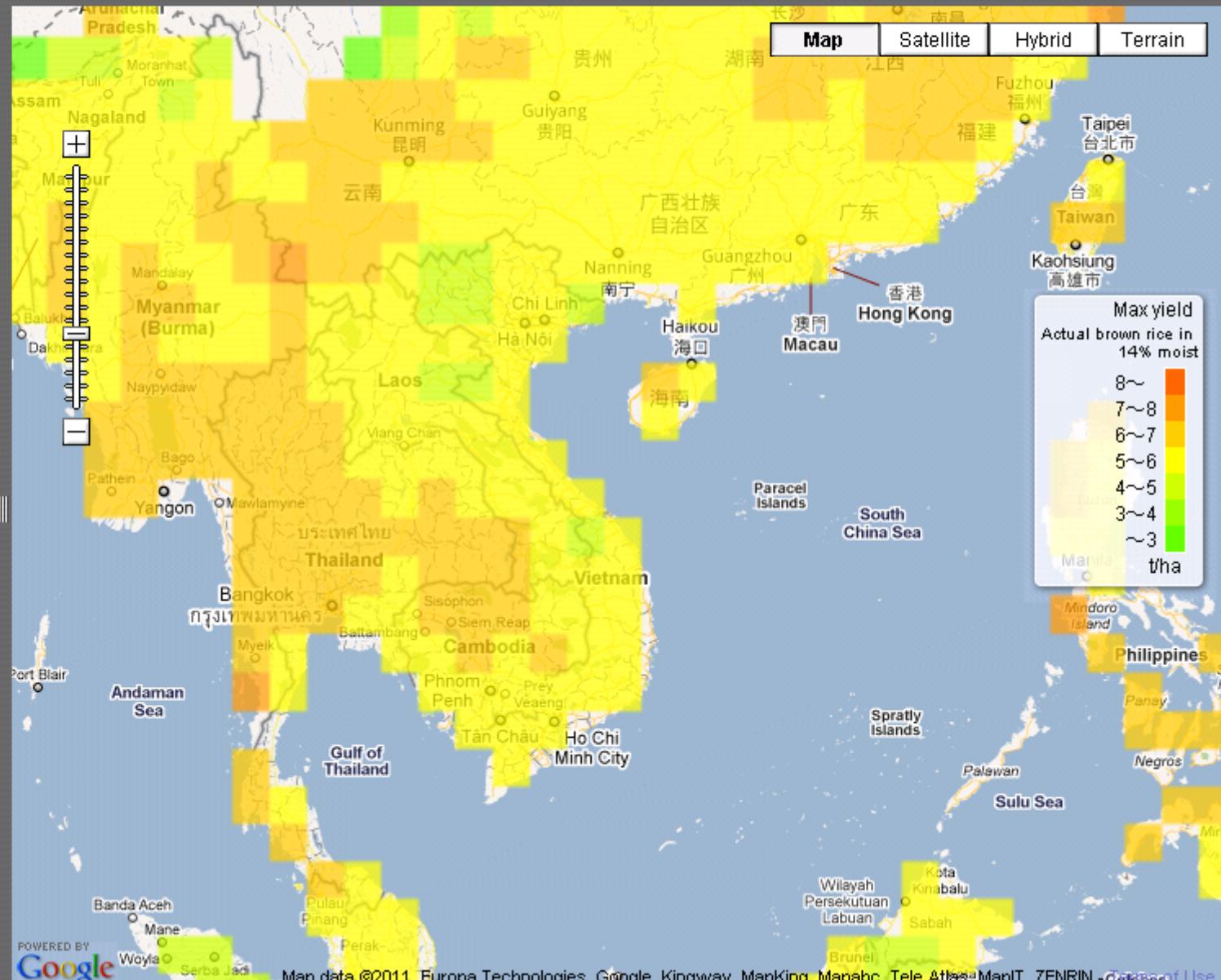
CO₂ concentration

350ppm 525ppm

Download world wide data
(zip file: about 550KB)

[Download](#)

POWERED BY





イネの栽培可能性予測 シミュレーター

Top

Help

品種から最適地を探す

地点から最大収量品種を探す

品種

- イシカリ
- ササニシキ
- コシヒカリ
- 日本晴
- ミズホ
- IR36**
- IR64
- IR58

気温加算

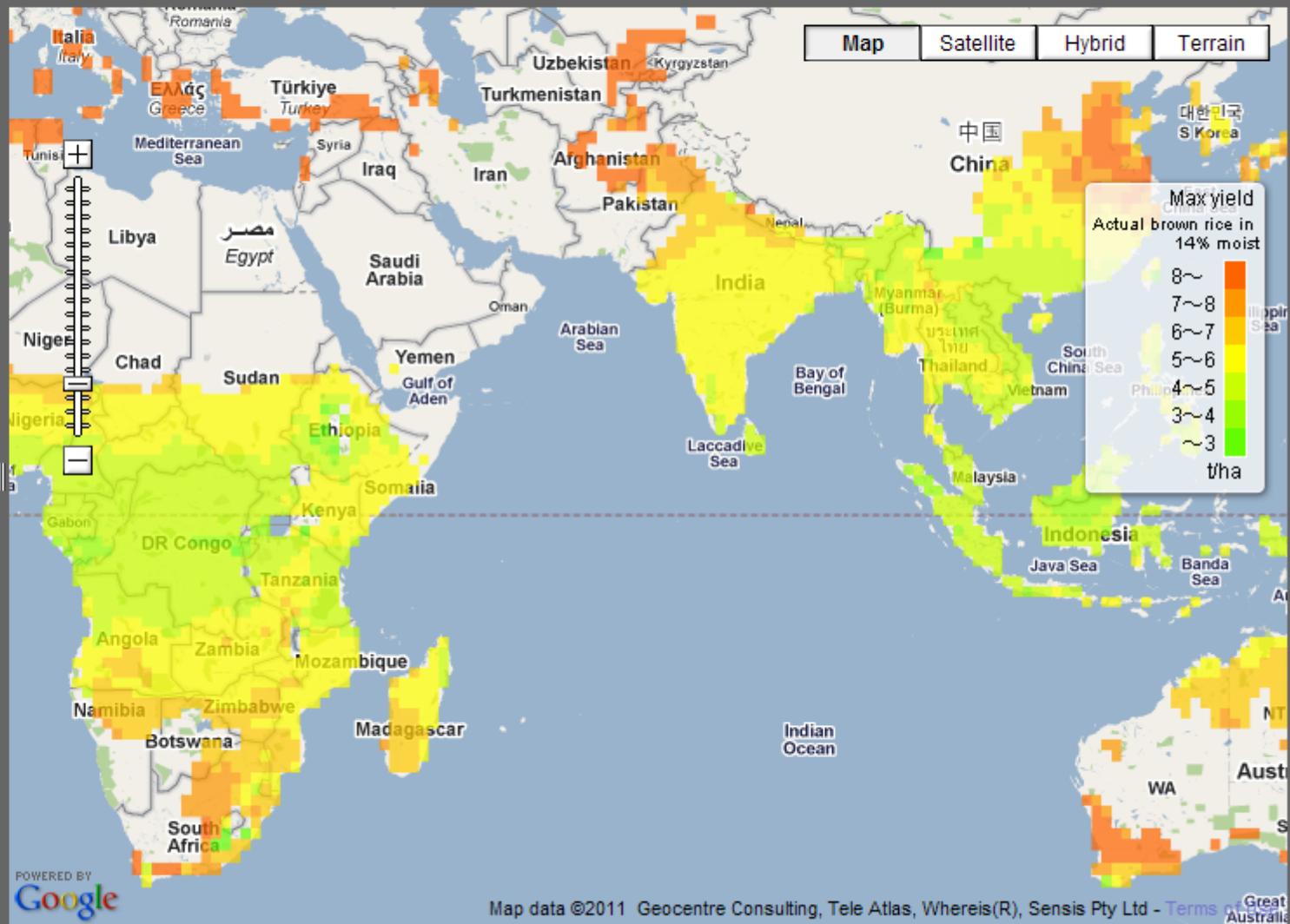
0°C 2°C 4°C

CO₂濃度

350ppm 525ppm

地球規模データのダウンロード
(zipファイル:約550KB)

[ダウンロード](#)





イネの栽培可能性予測 シミュレーター

[Top](#)[Help](#)[品種から最適地を探す](#)[地点から最大収量品種を探す](#)

品種

- イシカリ
- ササニシキ**
- コシヒカリ
- 日本晴
- ミズホ
- IR36
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- IR58

気温加算

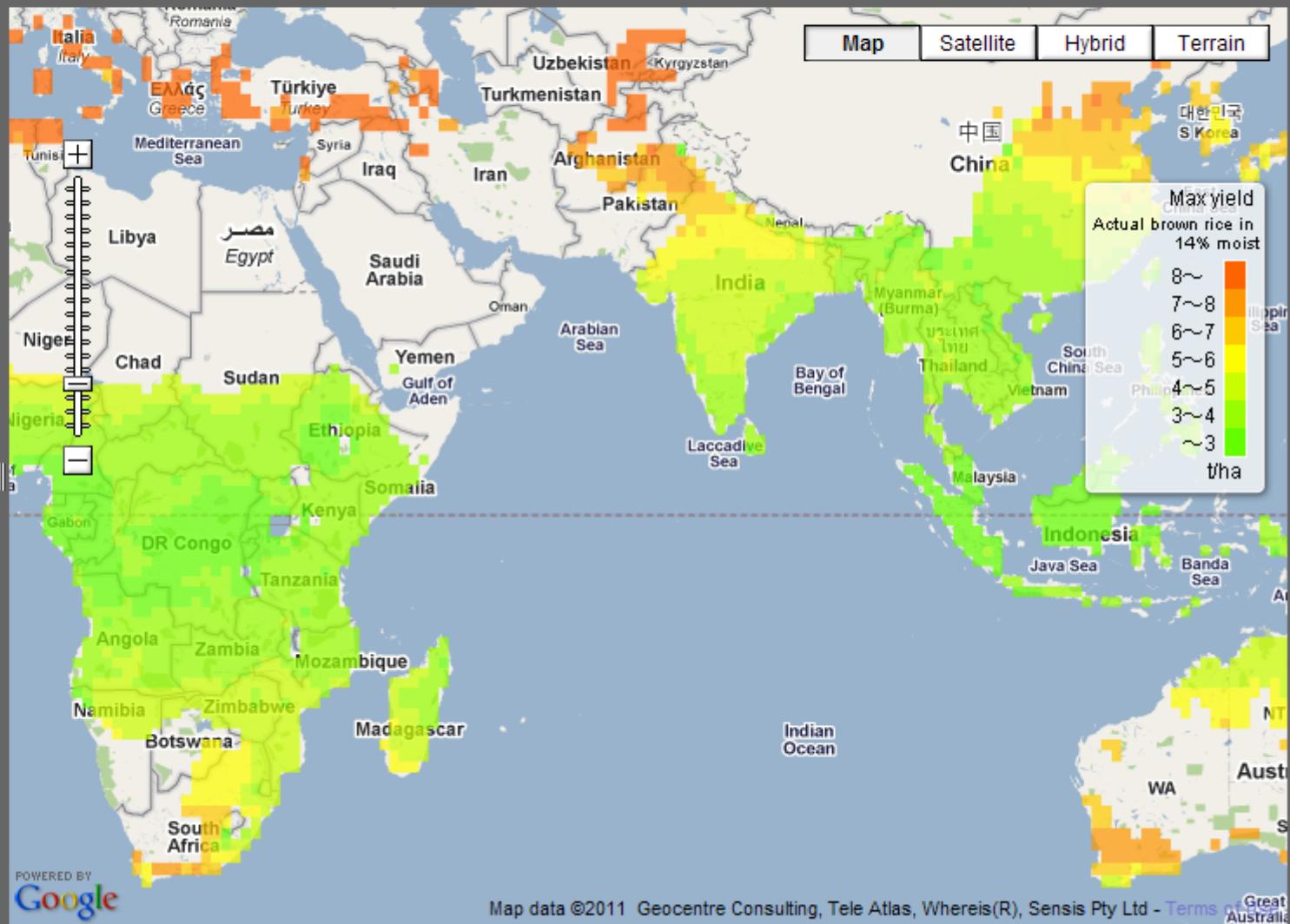
0°C 2°C 4°C

CO₂濃度

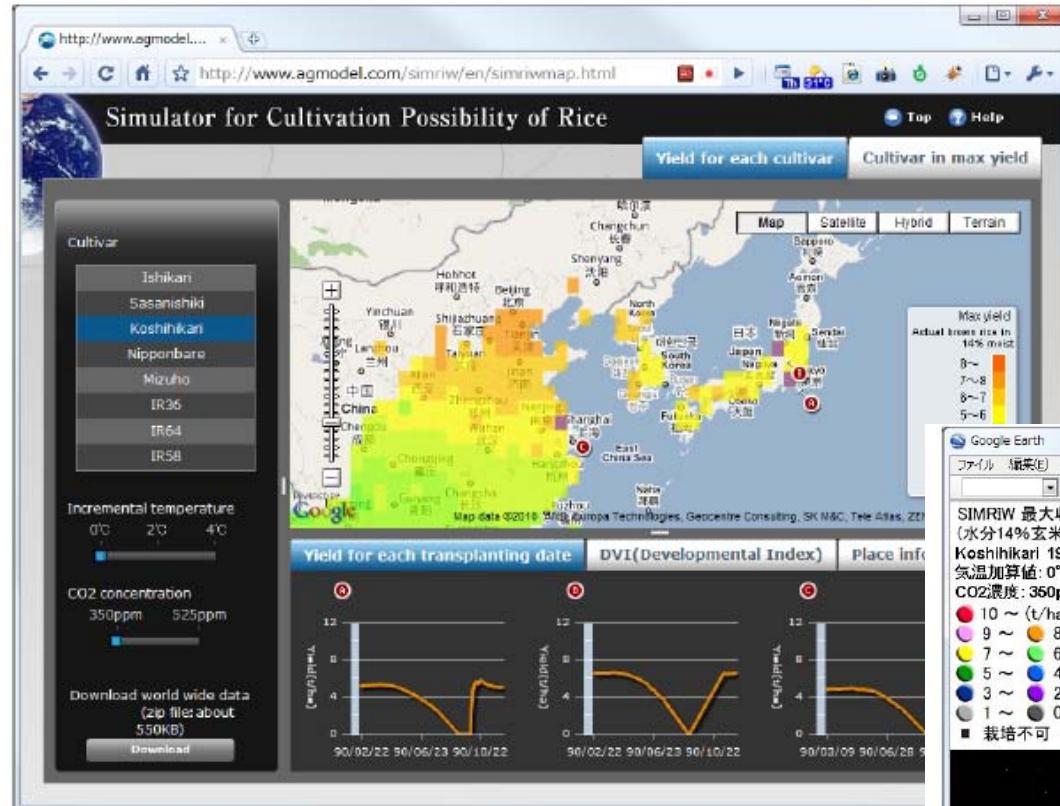
350ppm 525ppm

地球規模データのダウンロード
(zipファイル:約550KB)

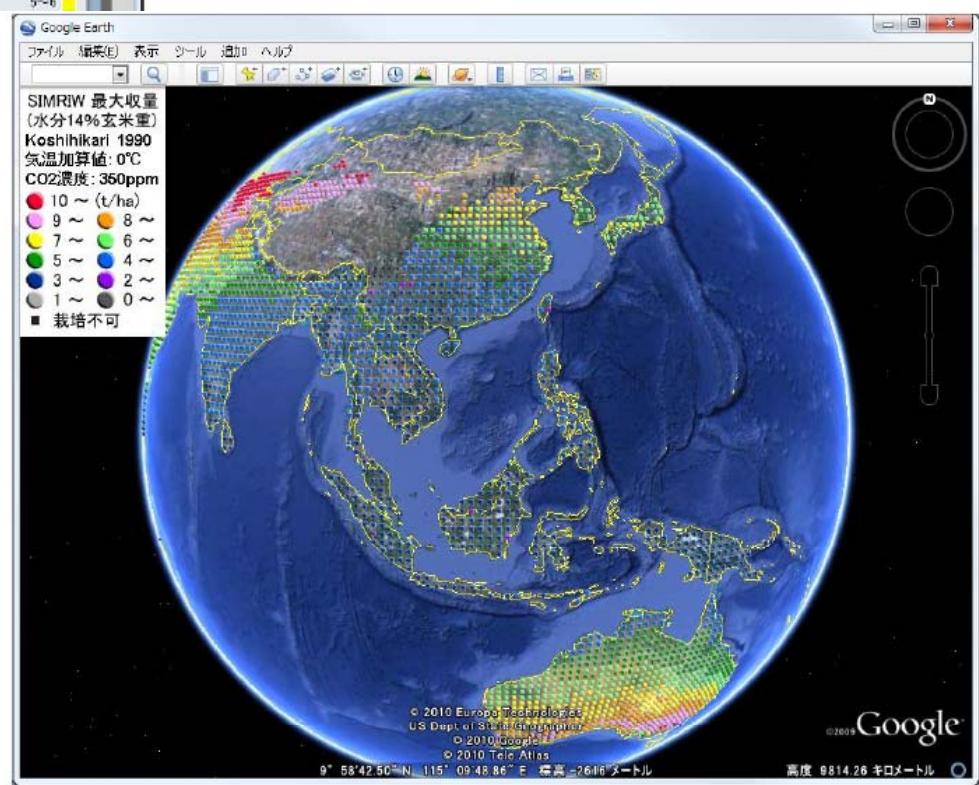
[ダウンロード](#)



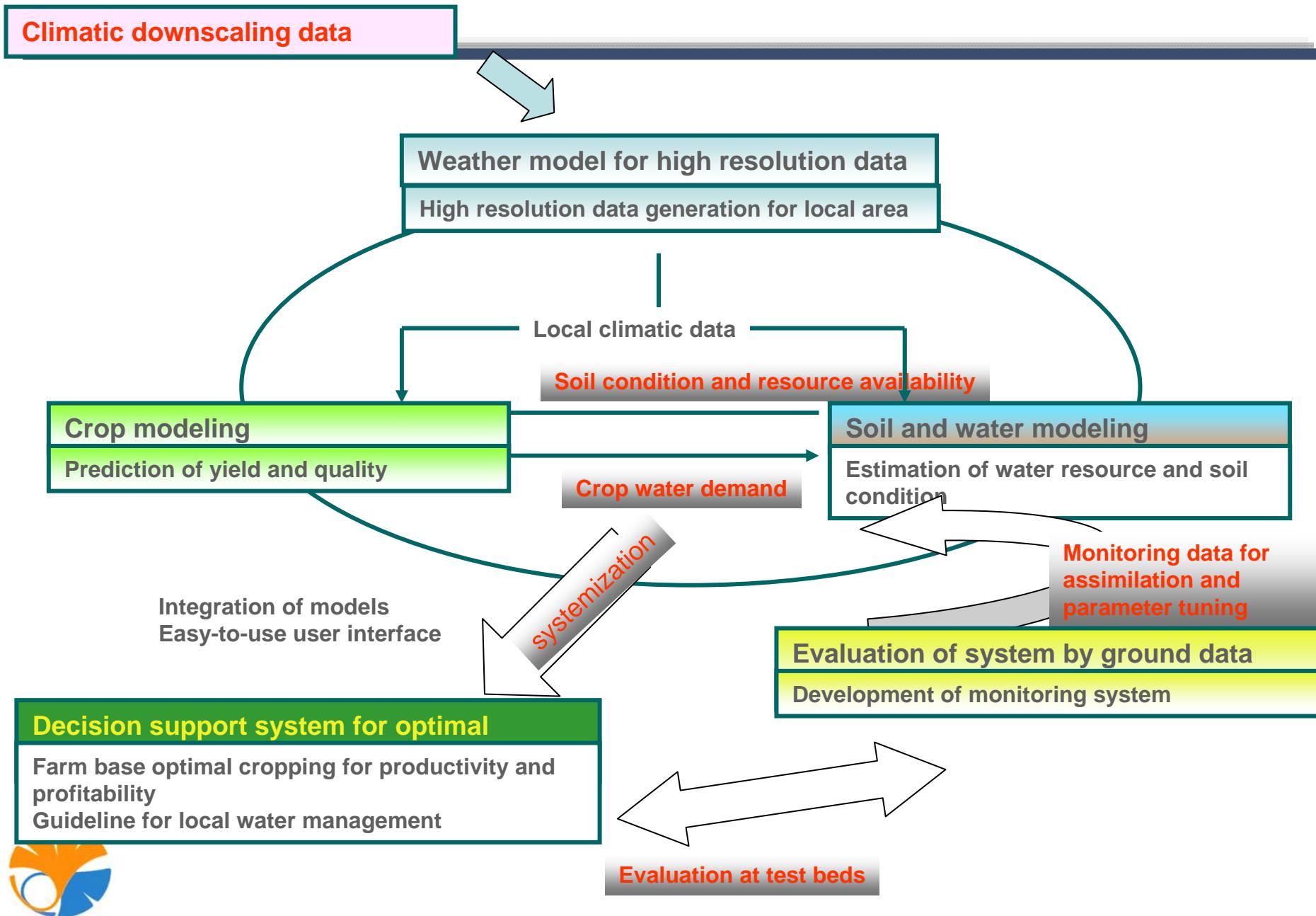
Rice yield simulator



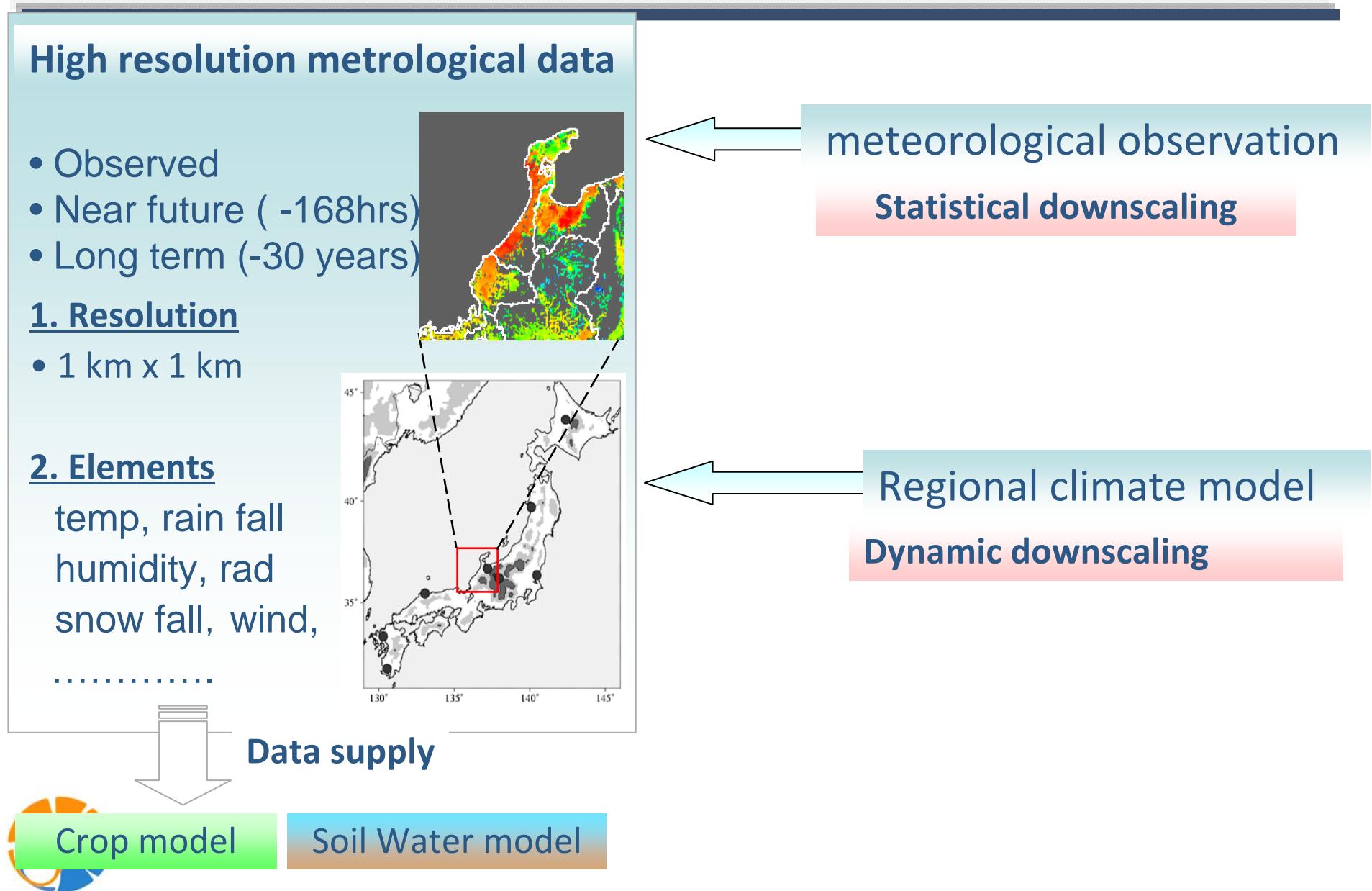
- No considerations on soil condition
- Terribly low resolution of prediction
- No guidance for optimal cropping



Outline of research



Meteorological data downscaling model



Ground Monitoring

Deployment



Test beds in three prefectures in Japan

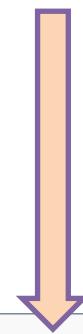
福井県大麦畑

富山県大麦畑

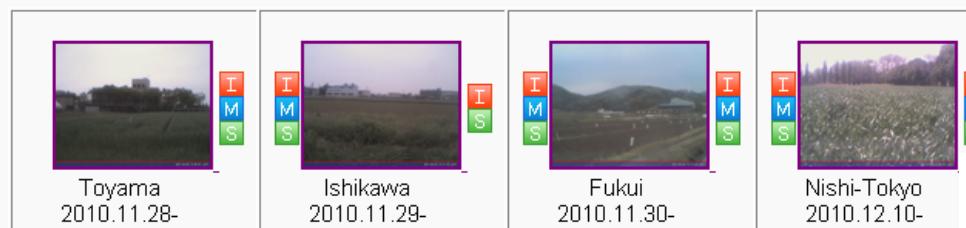
石川県水路

Data supply

Data assimilations
Model calibrations



[Method](#) [Sites overview](#) [Login](#)

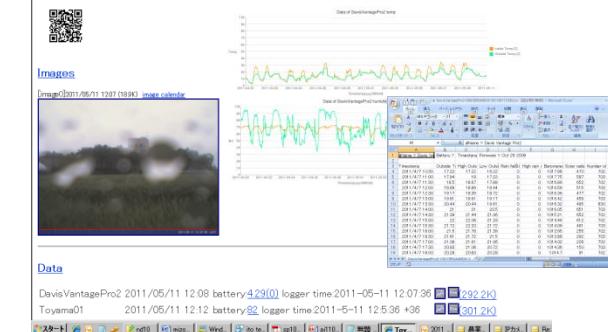


I=image, M=meteorologic, S=soil (Left side icons for yesterday, right side today)



Monitoring tools

[Toyama01](#) last seen: 2011/05/11 12:30 (JST GMT+9)

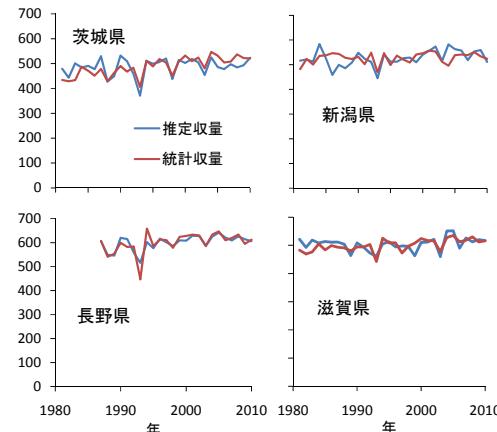


	Toyama	Ishikawa	Fukui	Nishi-Tokyo
2011/03/31	M S T M S T S T M S			
2011/03/30	T M S T M S T M S T M S			
2011/03/29	T M S T M S T M S T M S			
2011/03/28	T S T M S			
2011/03/27	T S T M S T M S			M S
2011/03/26	T M S T M S			T M S
2011/03/25	T M S T M S			T M S

Data tools

Crop model

Productivity model



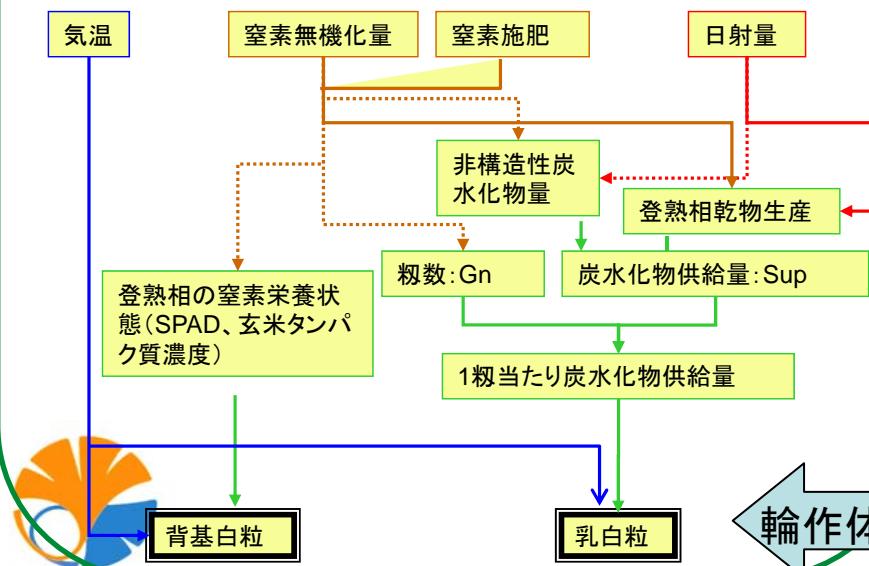
Rice

Wheat

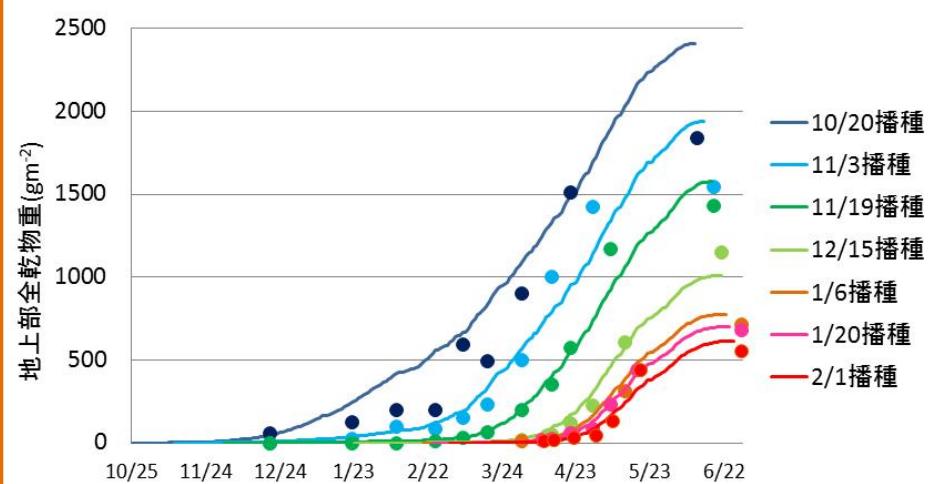


水稻生育収量予測モデルと白米熟粒発生予測モデルをドッキング！

Quality model

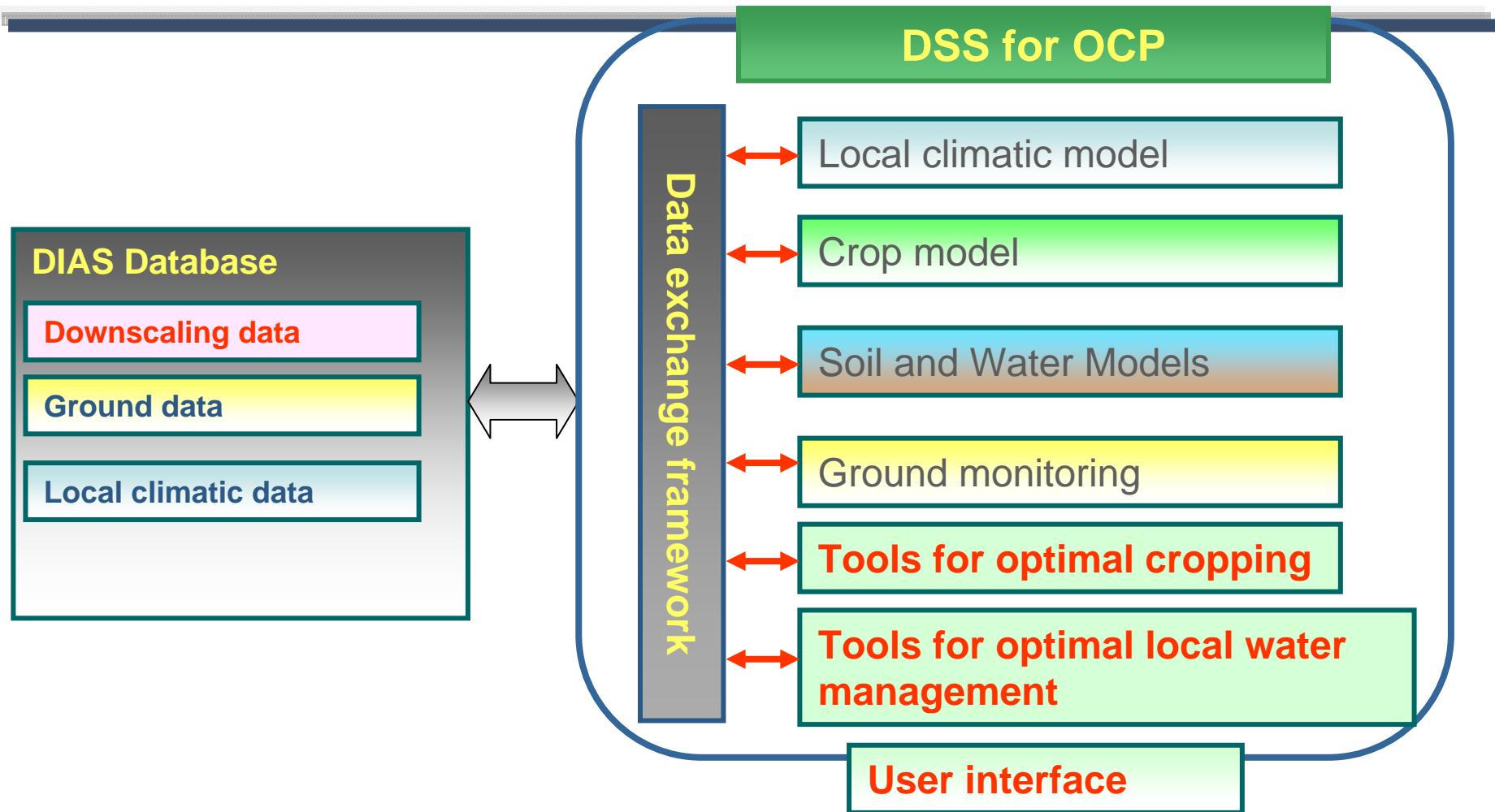


輪作体系最適化



モデルによる地上部全乾物重の推定値(ライン)と実測値(シンボル)
(品種: 農林61号 観音台畑圃場(淡色黒ボク土))

DSS for optimal crop production



- Decision support for optimal cropping for productivity and profitability
 - Optimal amount and timing of fertilizer and irrigation, selection cropping period and variety, double cropping system
- Guideline for local water management



Tweeting FieldServer



tdr0003 (tdr0003) on Twitter - Windows Internet Explorer
http://twitter.com/#!/tr... gooウェブ検索(Green Label)

ファイル(E) 編集(E) 表示(V) お気に入り(A) ツール(I) ヘルプ(H)
お気に入り

Welcome to #NewTwitter! Read up on what's new. You can still access old Twitter for a limited time.

tdr0003 tdr0003
V 6.8,T 9.3,F 136227
12月21日

tdr0003 tdr0003
V 6.9,T 9.8,F 136679
12月21日

tdr0003 tdr0003
V 6.9,T 9.8,F 136950
12月21日

tdr0003 tdr0003
V 6.9,T 10.8,F 137504
12月21日

tdr0003 tdr0003
V 7.0,T 11.7,F 138081
12月21日

tdr0003 tdr0003
V 7.1,T 13.2,F 138593
12月21日

tdr0003 tdr0003
V 7.2,T 14.2,F 139127
12月21日

tdr0003 tdr0003
V 7.2,T 16.1,F 139310
12月21日

tdr0003 tdr0003

Twitter社
プライバシ
ビジネス

ページが表 インターネット | 保護モード: 有効 100%

A screenshot of a Windows Internet Explorer window showing a Twitter feed for user 'tdr0003'. The feed displays nine tweets from December 21st, each containing a timestamp, location coordinates (V, T, F), and a unique identifier (e.g., 136227, 136679). The interface includes standard browser controls like back, forward, and search, along with a sidebar for Twitter business and privacy information.

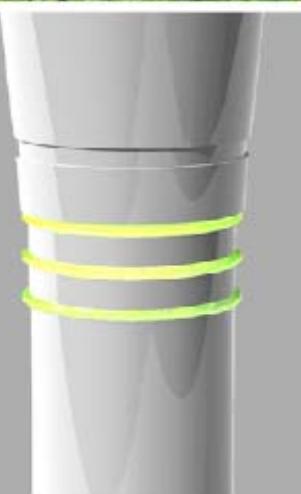
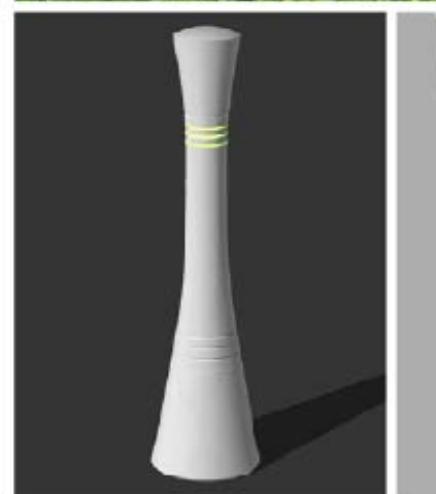
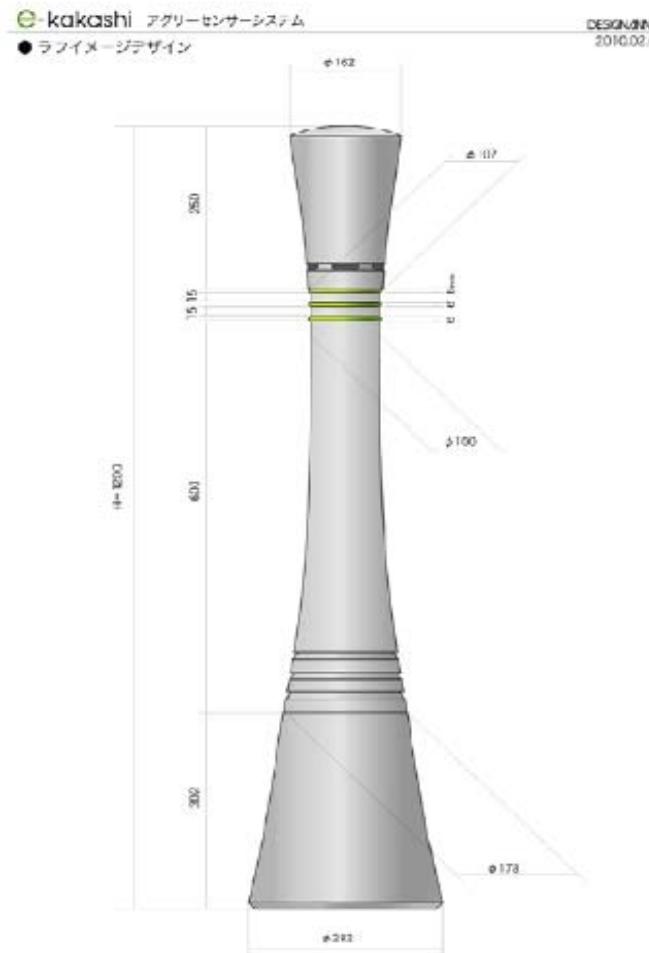


e案山子(e-Kakashi = eScarecrow)

e-kakashi

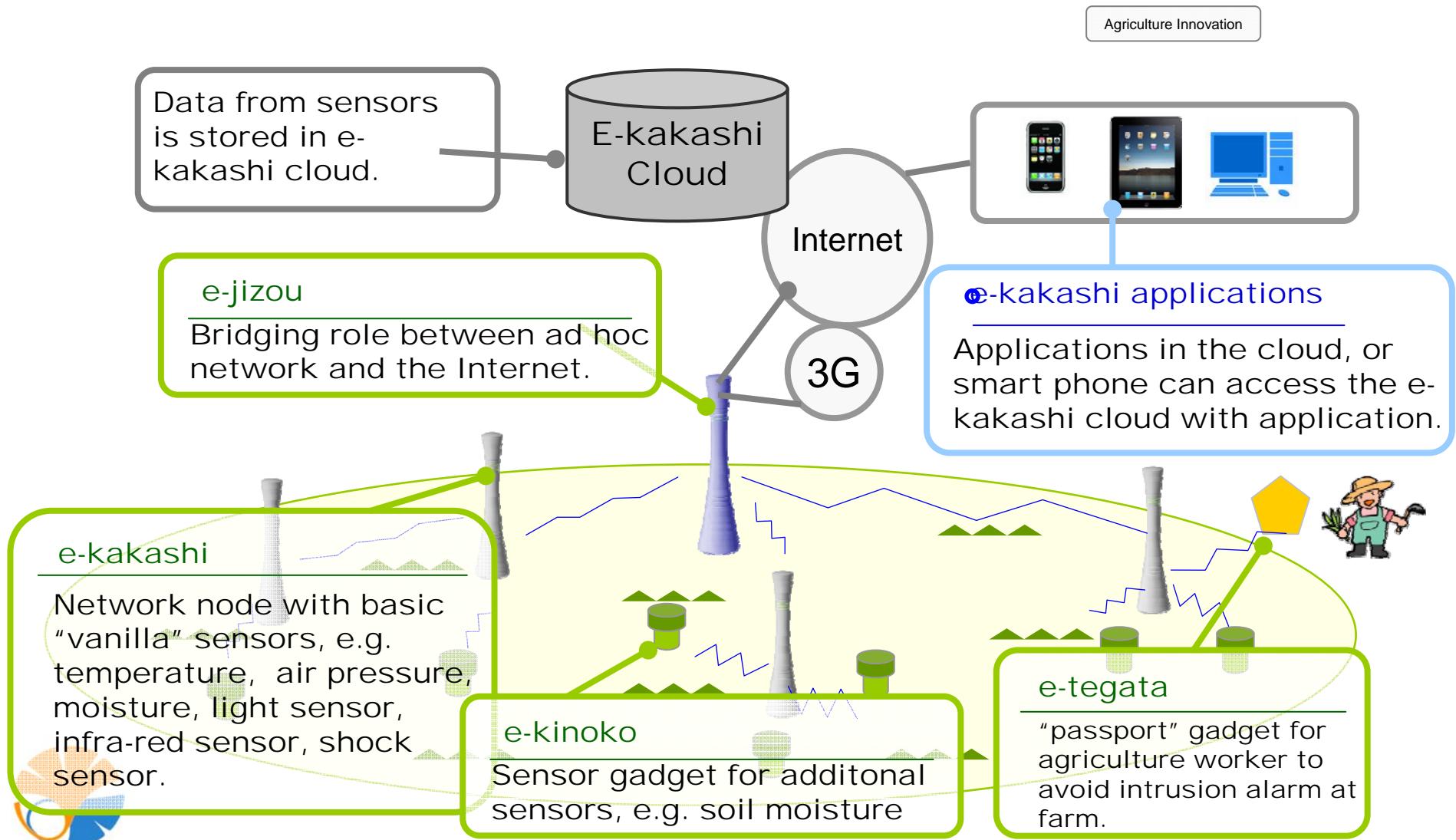
SoftBank

APPENDIX Image Design



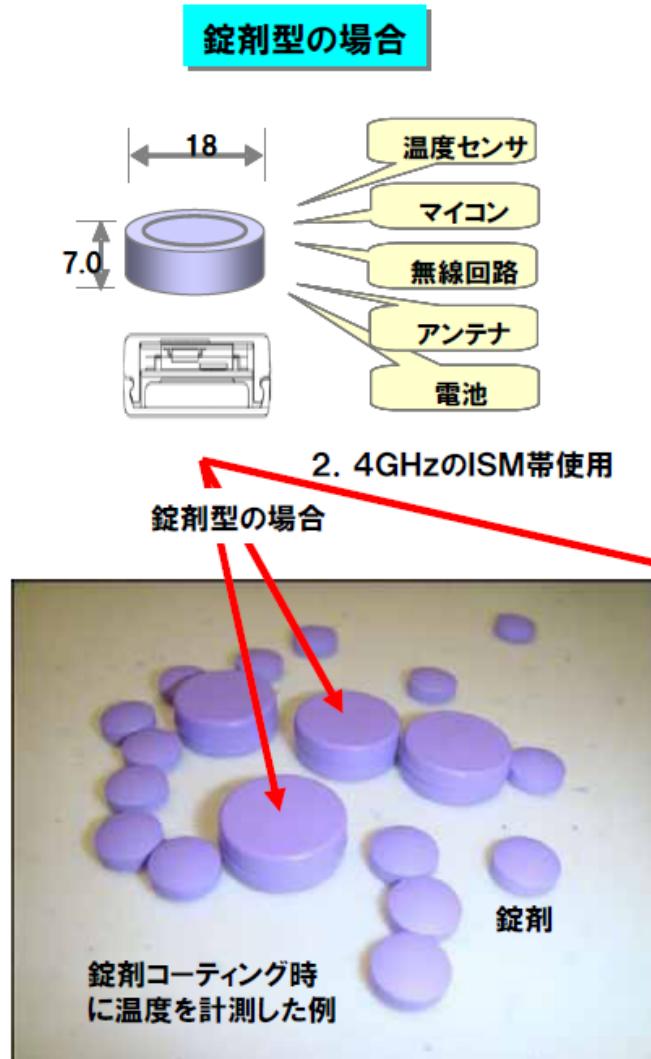
e-kakashi solution

E-kakashi makes structure of ad hoc network with sensor gadgets



無線温度センサモジュール(錠剤タイプ)開発状況ご紹介

【基本開発コンセプト】



【温室の土壤用無線センサと携帯電話との連携など】

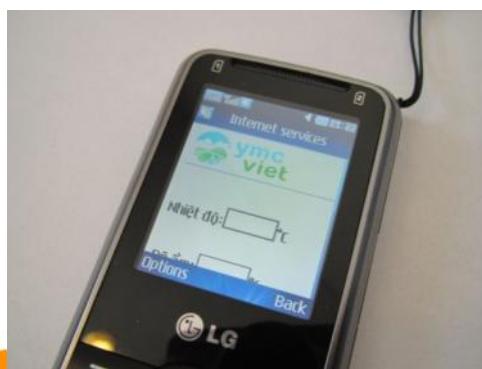


※小型で自立形のため、ばら撒いて使用することが可能。



In YMC Viet, kids work as sensors in addition to bridging their families to technology

Air temperature and humidity



Plant height, leaf color, pests

Plant images



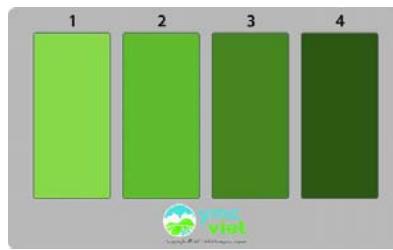
Tools used in YMC Viet



(1) YMCViet Passport



(2) Measurement



(3) Leaf color plate



(4) Insect plate



(5) Mobile phone



(6) Recharger



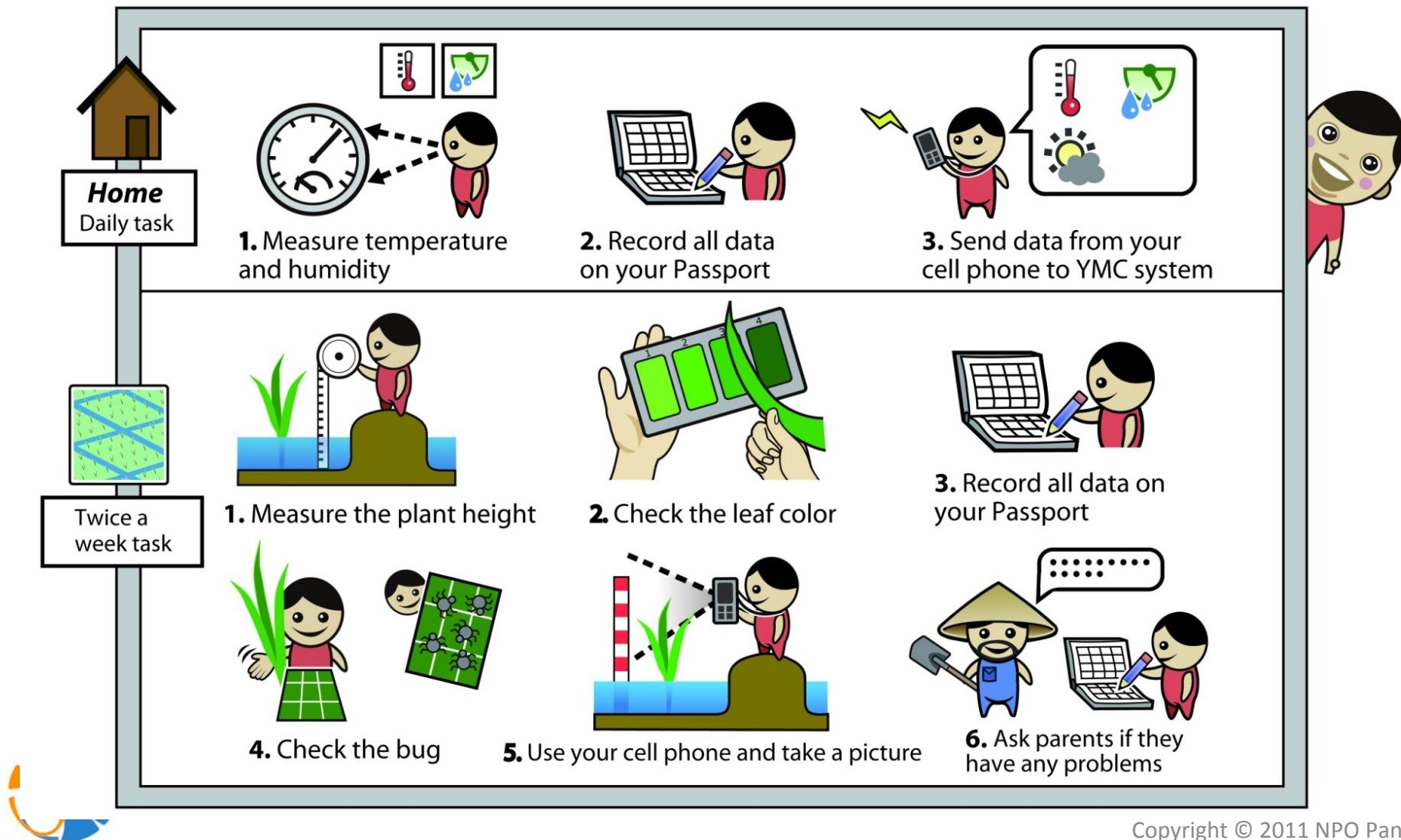
(7) Erasable pen



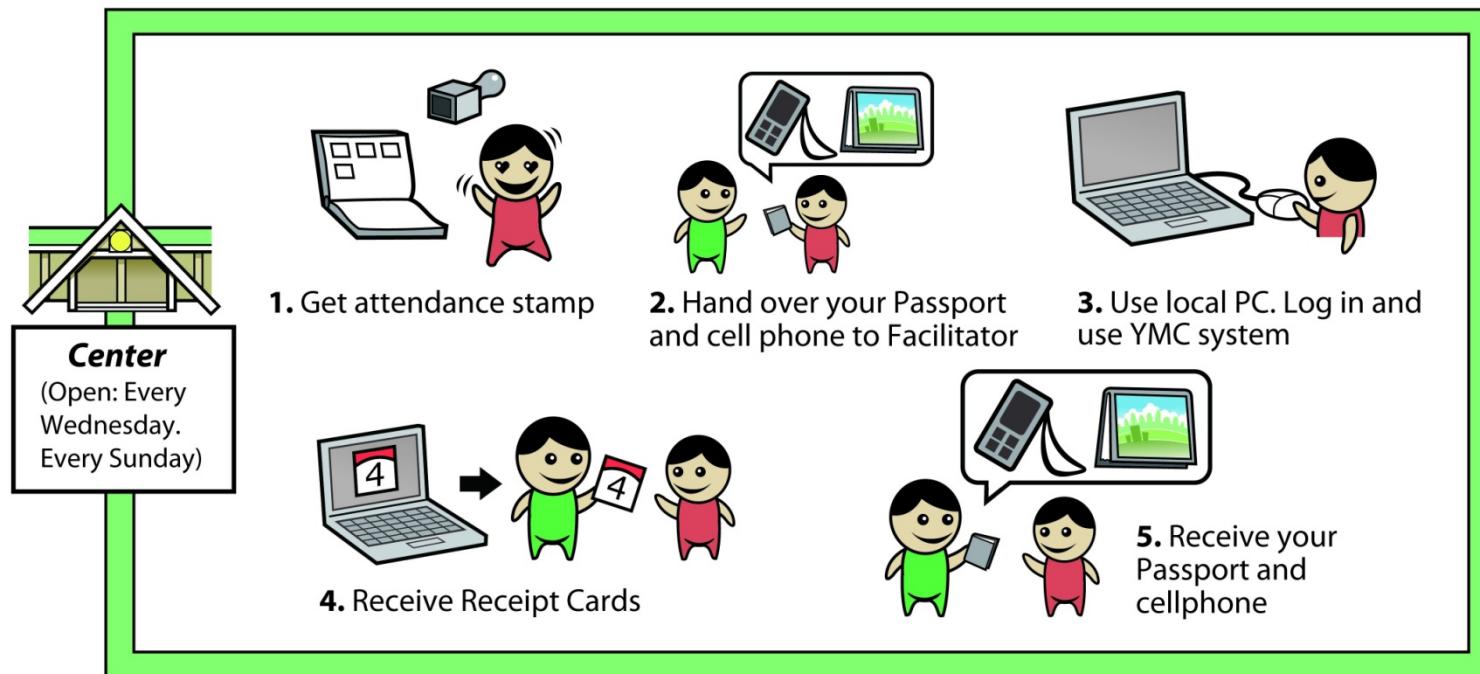
(8) Bag



Youth Flow 1/2



Youth Flow 2/2



Number of sensor nodes

Crop production (B. tons) in 2008

Total grain		2.53
Main grains	合計	2.36
	Paddy rice	0.69
	Wheat	0.69
	Barley	0.16
	Maize	0.82
Tuber crops		0.73
Soybean		0.23

FAO STAT 2009

Land area (B. ha) in 2008

Total land		13.00
Total arable land		1.41
Main crop	Total	0.68
	Paddy rice	0.16
	Wheat	0.22
	Barley	0.06
	Maize	0.16
	Soybean	0.09

FAO STAT 2009





Thank you very much

<http://www.agmodel.net/DataModel/>

二宮正士 snino@isas.a.u-tokyo.ac.jp

