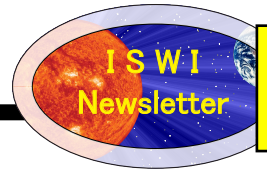

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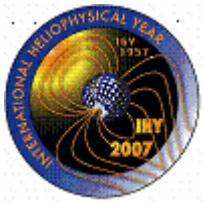
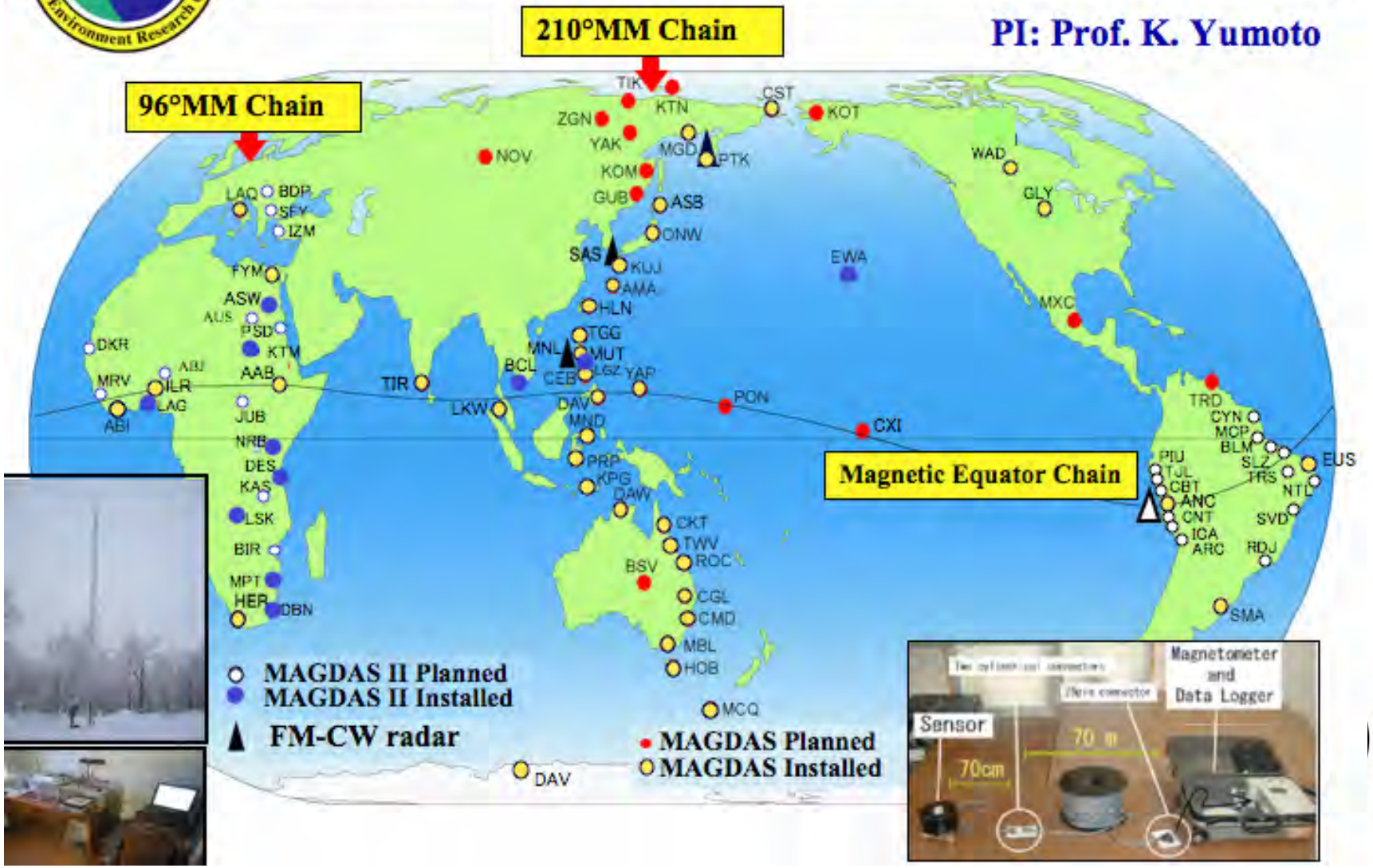
Real time Data Transfer Techniques of the Global MAGDAS Magnetometer Network

G.Maeda, S.Abe, T.Uozumi,
L.M. Musafar, K.Yumoto.

Presented at
2009 UN BSS & IHY Workshop
21-25 Sept, 2009
Daejeon, Korea.



1. MAGDAS (MAGnetic Data Acquisition System) Network at SERC, Kyushu Univ.



MAGDAS Data Volume

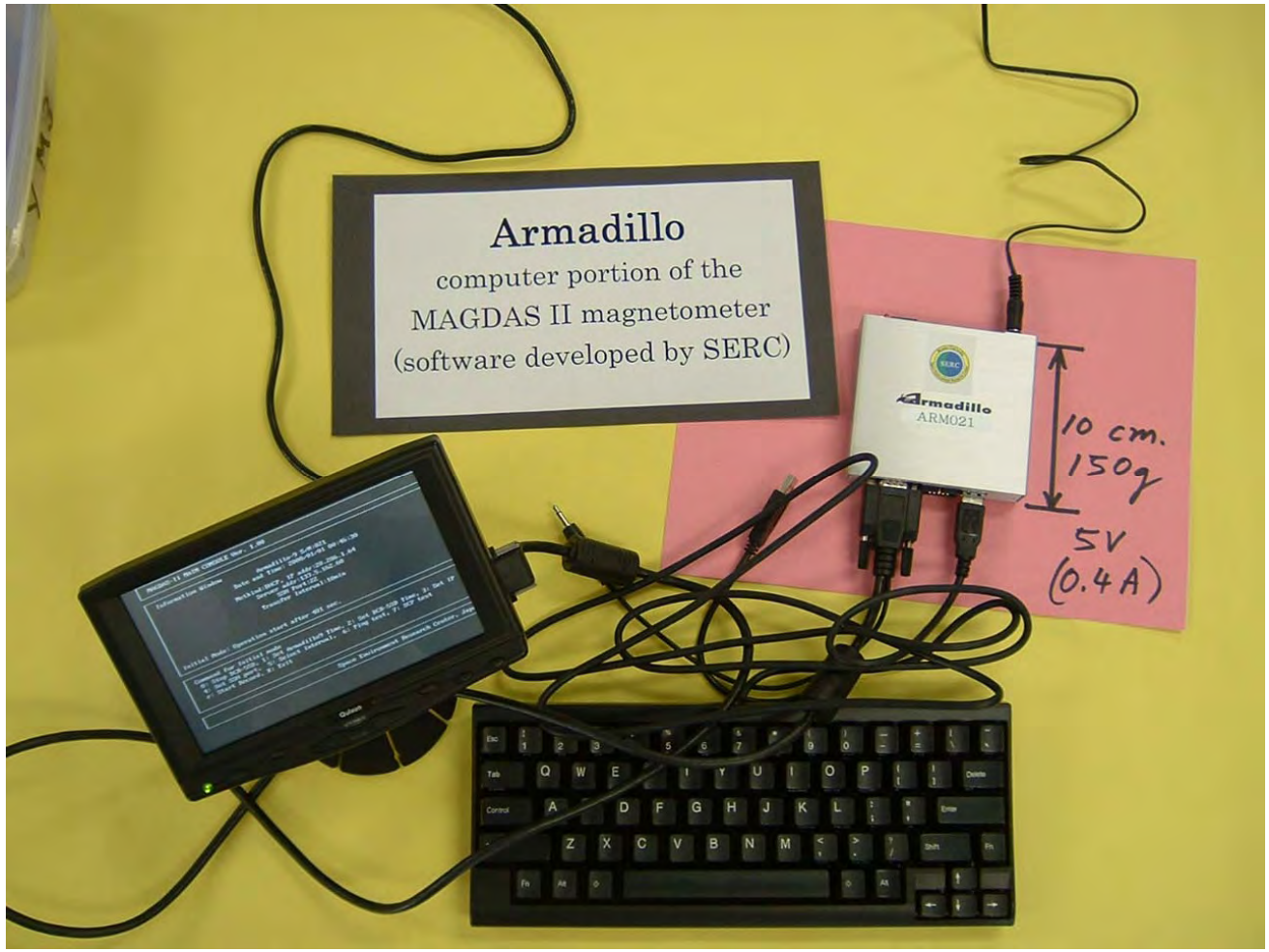
- MAGDAS I (3 MB per day), creates about 1 GB per year.
- MAGDAS II (0.6 MB per day), creates about 0.2 GB per year.

THEREFORE, THE MAGDAS ARRAY GENERATES ABOUT 42 GB/YEAR.

MAGDAS I magnetometer

1. Data logger (main unit)
2. Cable to sensor
   (70m in length)
3. Fluxgate sensor

Computer portion of the MAGDAS II magnetometer



Right now there are 49 MAGDAS Stations

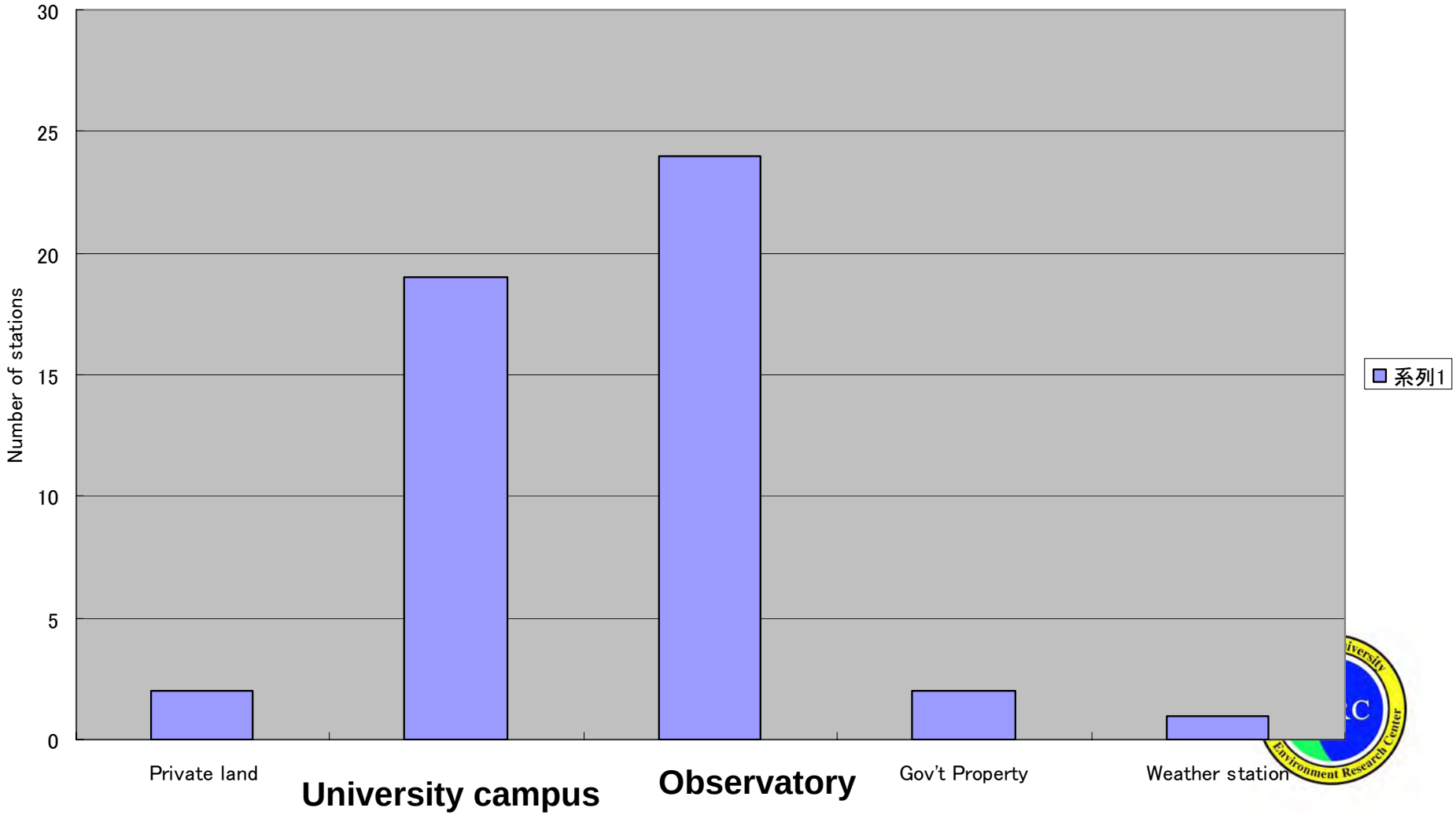
1	**AAB**	Addis Ababa, Ethiopia	21	**GLY**	Glyndon, USA	41	**PTK**	Paratunka, Russia
2	**ABJ**	Abidjan, Ivory Coast	22	**HER**	Hermanus, South Africa	42	**ROC**	Rockhampton, Australia
3	**AMA**	Amami Oushima, Japan	23	**HLN**	Hualien, Taiwan	43	**SMA**	Santa Maria, Brazil
4	**ANC**	Ancon, Peru	24	**HOB**	Hobart, Australia	44	**TGG**	Tuguegarao, Philippines
5	**ASB**	Ashibetsu, Japan	25	**ILR**	Ilorin, Nigeria	45	**TIR**	Tirunelveli, India
6	**ASW**	Aswan, Egypt	26	**KPG**	Kupang, Indonesia	46	**TWV**	Townsville, Australia
7	**BCL**	Bac Lieu, Vietnam	27	**KRT**	Khartoum, Sudan	47	**WAD**	Wadena, Canada
8	**CEB**	Cebu, Philippines	28	**KUJ**	Kuju, Japan	48	**YAP**	Yap Island, Micronesia
9	**CGR**	Culgoora, Australia	29	**LAG**	Lagos, Nigeria			
10	**CKT**	Cooktown, Australia	30	**LKW**	Langkawi, Malaysia			
11	**CMD**	Camden, Australia	31	**LSK**	Lusaka, Zambia			
12	**CST**	Cape Schmidt, Russia	32	**MCQ**	MacQuarie Island, Australia			
13	**DAV**	Davao, Philippines	33	**MGD**	Magadan, Russia			
14	**DAW**	Darwin, Australia	34	**MLB**	Melbourne, Australia			
15	**DES**	Dar Es Salaam, Tanzania	35	**MND**	Manado, Indonesia			
16	**DRB**	Durban, South Africa	36	**MPT**	Maputo, Mozambique			
17	**DVS**	Davis, Australia	37	**MUT**	Muntinlupa, Philippines			
18	**EUS**	Eusebio, Brazil	38	**NAB**	Nairobi, Kenya			
19	**EWA**	Ewa Beach, USA	39	**ONW**	Onagawa, Japan			
20	**FYM**	Fayum, Egypt	40	**PRP**	Pare Pare, Indonesia			

Recent addition:

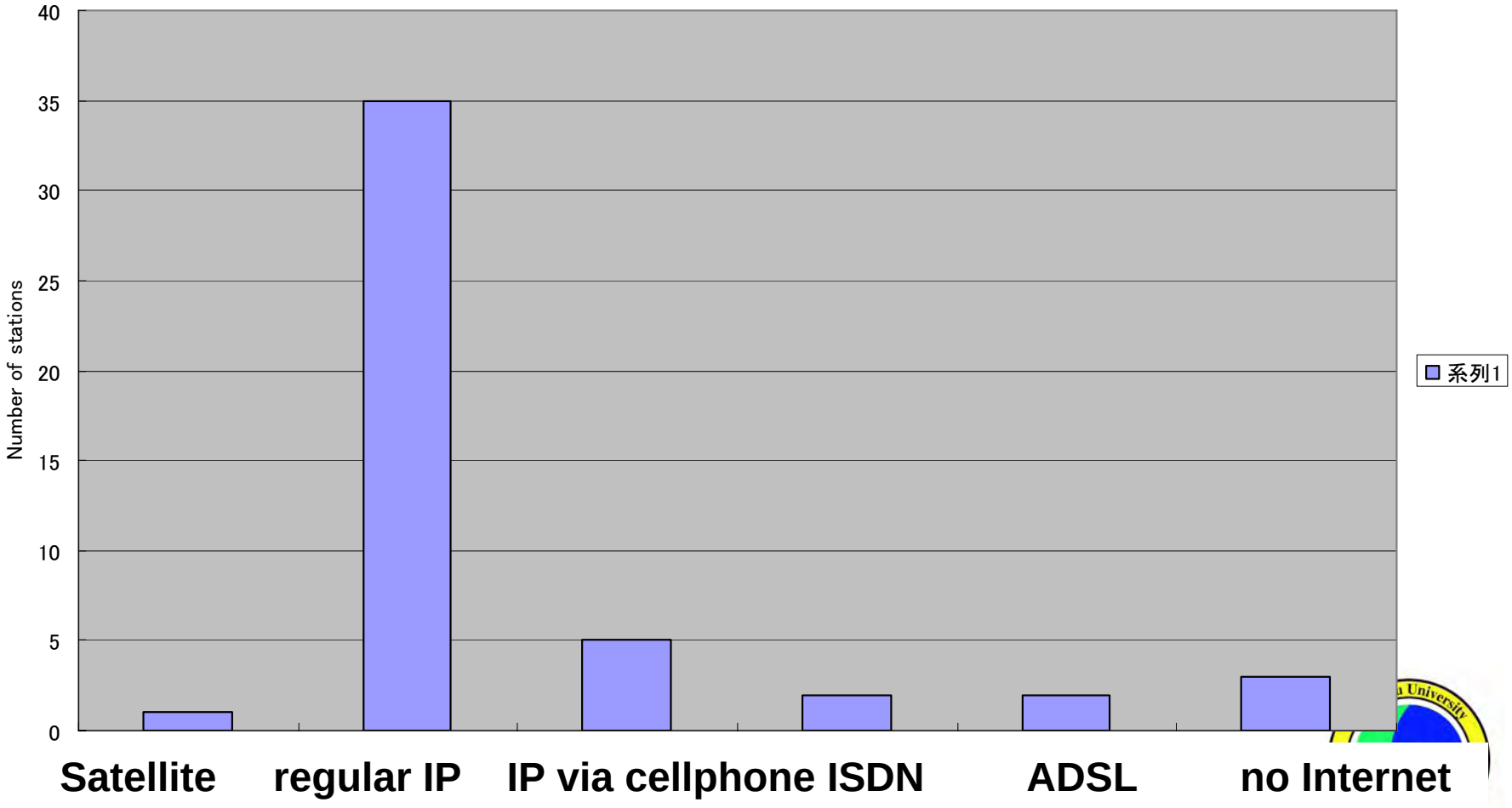
(49) **LGZ**

Legazpi, Philippines

Types of Land Used by MAGDAS units in the field



Types of Internet connections used by MAGDAS in the field.



Original Telemetry Design of the MAGDAS I System (Year 2003)

- Via modem and mobile satellite telephone
- Via modem and regular phone circuits
- Via Internet


Mobile
Satellite
Telephone
(Proposed for MAGDAS I)
ADVANTAGE
Can be used anywhere in the world.
DISADVANTAGE
High operational cost.

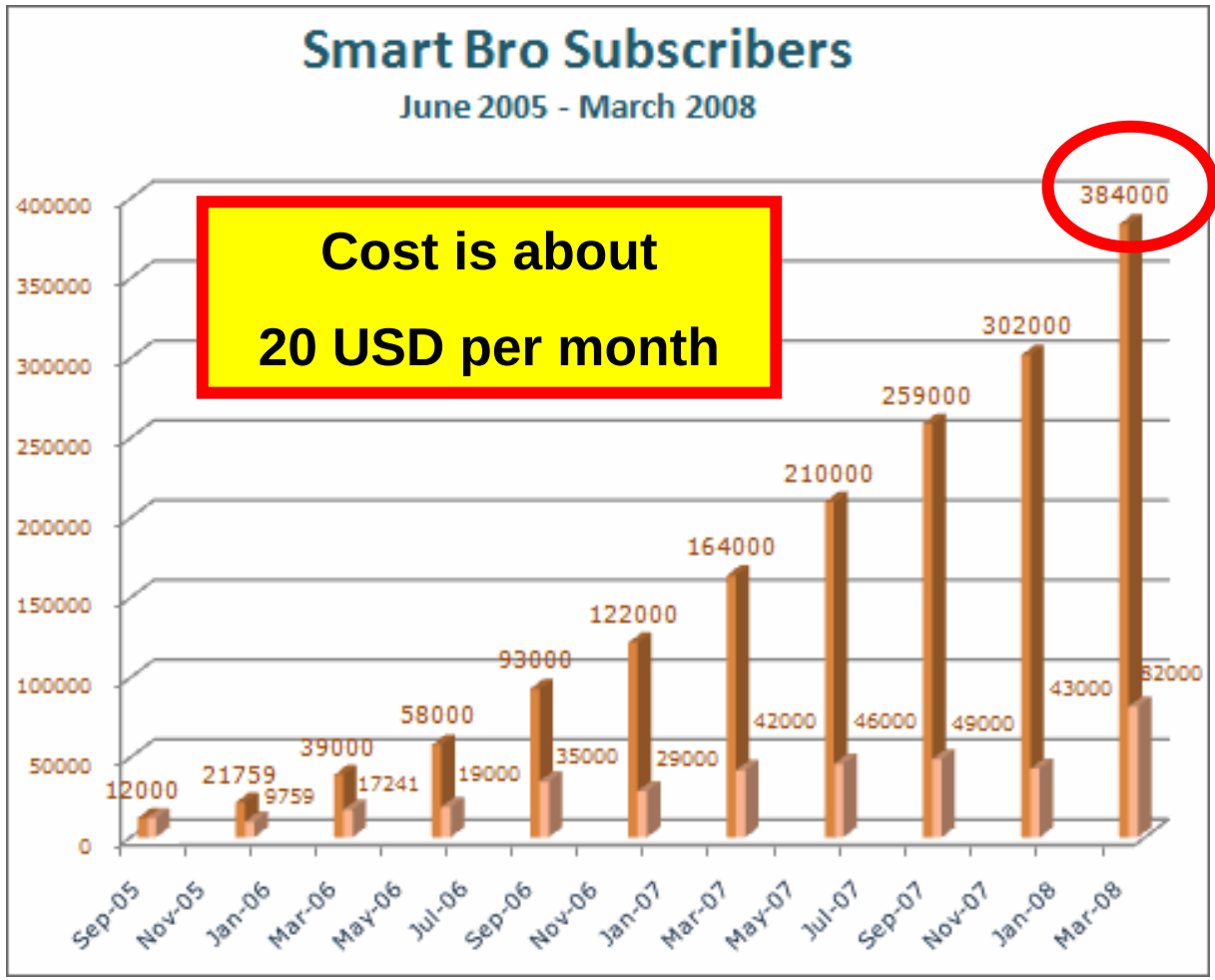
Two Challenging Countries for Real Time Data Transmission

- **Philippines**
- **Indonesia**

There are 5 MAGDAS Stations In the Philippines

In the Philippines MAGDAS uses Smart Bro

(Internet service based on cellular telephone technology)



Now over 384,000 subscribers in the Philippines

There are 3 MAGDAS Stations in Indonesia:

MND – Manado (most north)

PRP – Pare Pare (central)

KPG – Kupang (most south)

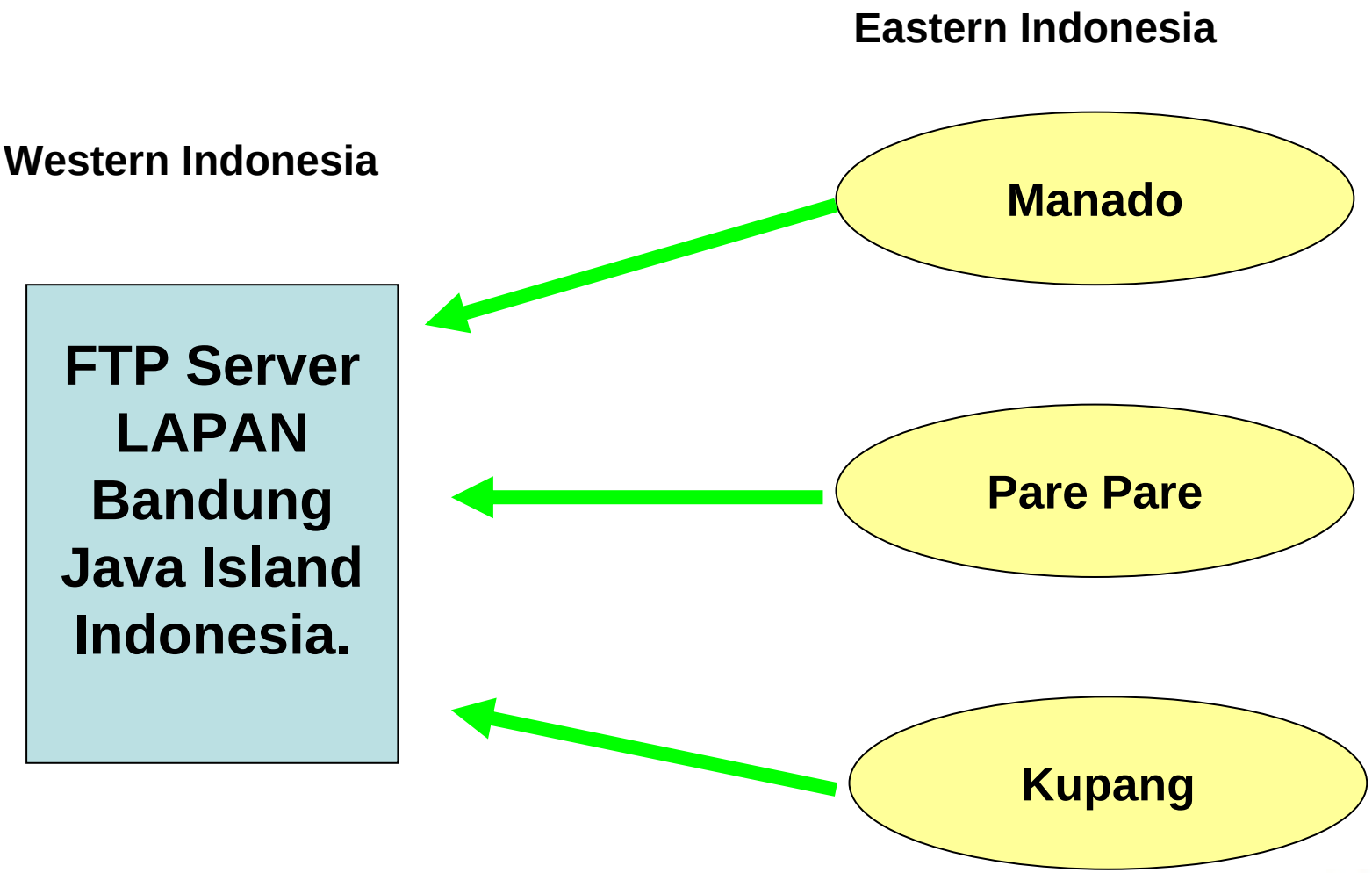
Sensor

Telemetry system used by MAGDAS in Indonesia was developed by L. M. Musafar

(a graduate of *Kyushu University* but now working in Indonesia).

To send data to Bandung (near Jakarta) using the country's GSM cellphone network, there are three possible methods (according to Mr Musafar):

1. General Packet Radio Service (GPRS)
2. Short Message Service (SMS)
3. High Speed Downlink Packet Access (HSDPA)



Via Indonesia's GSM cellphone network

Thank you !

From the entire *MAGDAS Project Team* of SERC at Kyushu University