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Report on lecture series in South Africa (February 20th to March 10th)

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1. Summary

We visited four Universities (University of Pretoria, UP; University of Western Cape, UWC; University of Cape Town, UCT; Rhodes University, RU) and one governmental institute (South African Weather Services, SAWS). Professor Ikeda gave lectures about general knowledge of climate change and role of the ocean. Nagura, Sasaki and Ratna gave lectures about technical issues at UP and SAWS and made research-based presentations at UWC and RU. As overall impressions, South African college students are educated as well as Japanese college students. The faculty members have general knowledge of geophysical fluid dynamics and climate dynamics, even if they are not majoring physical oceanography or physical atmospheric sciences. However, number of faculty members is generally small in South Africa compared to Japan, which may reduce variety of research themes available to students. We are sure that this lecture series had a role in widening student's scientific view. Also, the lecture series were useful to introduce our expertise and interest to local researchers, by which a collaborative work had begun between South African researchers and us. Details are described in the rest of this report.

2. Members and Schedule

Prof. Motoyoshi Ikeda
Dr. Motoki Nagura
Dr. Wataru Sasaki
Dr. Satyaban Ratna
Ms. Naoko Miyamoto
Ms. Kaoru Takahashi

February 22nd, 23rd, 25th to 28th, 2011: University of Pretoria
February 24th, 2011: South African Weather Service
March 2nd, 2011: University of Western Cape
March 3rd, 2011: University of Cape Town
March 4th to 8th, 2011: Rhodes University

3. About students or scientific communities

Education level. We had a chance to listen to UP graduate students' presentations (Feb 25th). They were educated as good as Japanese national university graduate students.

The master course student was using statistical analysis in their studies (correlation analysis and trend estimates) with good knowledge of sciences. The doctor course students had specific and detailed proposals for their Ph.D theses (note that some of the Ph.D students were preparing their theses under supervision of UP faculties while working in some research institute). We should adjust contents of our lectures for them. The faculty members of all the Universities had general knowledge of physical geosciences, even if their majors are not physical sciences.

Manpower. Number of researchers is relatively small in South Africa, although their scientific level is high enough. A director of SAWS said shortage of manpower was their major problem. A master course student gave lectures on geophysical fluid dynamics to undergraduate students at UP.

Research theme. As is written before, we had a chance to listen to UP graduate students' presentations. The graduate students tend to focus on local problems in the South Africa, mentioning poverty of South African people and role of their studies in helping local people. One of what JAMSTEC researchers can help them is to extend their knowledge through lectures about large-scale climate variability, which is potentially related to the South African local problems.

Lack of fund. The computer resources are not enough in many universities, which obstacles their advanced research. Researchers in the Bruce Hewitson's laboratory at UCT were able to manage to perform some good researches but they were working with limited number of processors and eagerly waiting for more computational power with the use of JAMSTEC funds. They were expecting to complete the simulation once the new computer is ready.

Response. Undergrad students of UP responded very keenly to Prof. Ikeda's lecture, seriously listening and nodding to words from Prof. Ikeda. This indicates high interest in environmental problems from local students. Meanwhile, they are bit shy to ask questions and talk with us.

4. Collaborative work

Nagura and Ratna began collaborative work with Prof. Hannes Rautenbach and Dr. Natalie Burl of UP about description of synoptic weather pattern in South Africa. Also Prof. Rautenbach suggested that we could co-supervise the undergraduate students of UP, who were majoring human geosciences (such as application of a Malaria model to South Africa).

Some of the researchers in SAWS were conducting downscaling and they were interested for collaborative work with JAMSTEC.

Staff members and students of the universities are very eager to have short visit to international research centers (like JAMSTEC) to enhance their research capabilities. Especially, It is preferable to give permissions to postgraduate students to come to Japan and allow them to learn statistical analysis and basic meteorology.

Comment.

To find collaboration, it is preferable to make presentations from Japanese side, so that South African researchers get to know our skill and research interest. Just going there and trying to talk to them did not work.

5. Characteristics of each University

UP: They have meteorology lab and environmental science lab. No oceanographic laboratories. The staff members were interested in statistical data analysis.

UWC: The students are majoring water management and not very familiarized with physical geosciences. The senior faculties had good knowledge about physics. Some of the staff members are interested in starting numerical modeling. We discussed these aspects with them.

UCT: They have a class for application of climate studies to society. Dr. Babatunde is giving lectures about climate modeling. This university has high standard of education and research compared to other universities.

RU: Students and faculties are based on fisheries or biological oceanography. We heard that there were other departments in this university, which dealt with Earth science and Geography. It will be better to interact with those departments as well in the forthcoming visits.

Comment.

Most of the audiences in our lectures were the undergraduate, MSc, and PhD students, who had research backgrounds different from ours. Considering this situation, lecturers should make an effort to show them our cutting-edge studies in an understandable way, describing basic mechanisms in an illustrative manner. This may help to expand the knowledge of South African students who have an interest in meteorology-, oceanography-, and climate-related science.

6. Miscellaneous

Appointment to SAWS: We were interested in listening some chart discussion at SAWS to identify weather systems over South Africa but it couldn't happen. The staff members told us that we should have informed them about this schedule before we visited to their organization.

Accommodation: To avoid being involved by any crime, we did not go out of the hotels by ourselves. However, catching hire cars or reliable taxi drivers is often tricky. It is preferable for the hotels to have restaurants inside of it, as well as high security and stable Internet connection.

7. Details

Date	Time	Location		Members (JPN: Japan; SA: South Africa)	Subject
2/22	13:00-	UP	Meeting	JPN: Miyamoto, Nagura, Sasaki, Ratna SA: Hannes Rautenbach, Jane Olwoch, Robert Maisha, Natalie Burls	Schedule of this lecture series and visit to SAWS
	14:00-	UP	Discussion	JPN: Ratna SA: Maisha	Technical problems in WRF model
2/23	14:30-15:20	UP	Lecture	JPN: Ikeda SA: 30 attended (9 from Tanzania; 2 from Zambia)	Principles of geophysical fluid dynamics
2/24	10:00-11:00	SAWS	Colloquium	JPN: Ikeda SA: 15 attended.	Data assimilation.
	11:00-	SAWS	Meeting	JPN: All members SA: Nico Kroese, Themba Dube, Mnikeli Ndabambi, Winkr Jordaan, Morwakoma Matabane, Estelle Mark, Isaac Ngwano, Asmerom Beraki, Thando Noarana	Collaboration with SAWS
	12:00-	SAWS	Meeting	JPN: Ikeda, Nagura, Sasaki, Ratna	We observed video meeting between SAWS branches.
	14:00-	SAWS	Colloquium	JPN: Ratna SA: 14 attended.	Tutorial for Grads
	14:30-	SAWS	Colloquium	JPN: Nagura SA: 14 attended.	Statistical data analysis for climate variations
2/25	8:00-	UP	Presentation of research results	JPN: Ikeda, Nagura, Sasaki, Ratna SA: Mmaphefo Malueke,	Analyses of the contribution of major cations and anions to long-term salinity changes in the Lower Orange, Great Fish and Thukela
	8:30-	UP	Postgraduate proposal forum	JPN: Ikeda, Nagura, Sasaki, Ratna SA: Axwitamisi Eric Mudau	Atmospheric characterization during vicarious calibration of

					satellite sensors
	9:30-	UP	Postgraduate proposal forum	JPN: Ikeda, Nagura, Sasaki, Ratna SA: Obed Phahlane	Climate change vulnerability assessment for agricultural risk adaptation in South Africa
	10:30-	UP	Postgraduate proposal forum	JPN: Ikeda, Nagura, Sasaki, Ratna SA: Raven Jimmy	Rainfall and temperature trends/variabilities over South Africa
	11:30	UP	Lecture	JPN: Ikeda SA: About 80 undergraduate students	Sustainable world overcoming critical issues.
	14:00-	UP	Lecture	JPN: Ratna SA: 7 graduate students	Tutorials for Grads
	14:30-	UP	Lecture	JPN: Nagura SA: 7 graduate students	Statistical analysis
	15:00-	UP	Lecture	JPN: Sasaki SA: 7 graduate students	Ocean modeling
2/28	7:00-	UP	Discussion	JPN: Ratna SA: Maisha	Ratna solved technical problems Maisha had in numerical weather model WRF. Ratna gave short tutorial to Maisha about the domain configuration and nesting in the WRF model.
	7:30-	UP	Lecture	JPN: Ikeda SA: 25 students attended.	Principles of geophysical fluid dynamics
	11:00-	UP	Discussion	JPN: Nagura, Sasaki, Ratna SA: Rautenbach, Burl, Maisha	Collaborative work on classification of synoptic weather pattern over southern Africa
	12:30-	UP	Lecture	JPN: Ikeda SA: 80 undergraduate students	Sustainable world overcoming critical issues
	13:30-	UP	Lecture	JPN: Ikeda SA: 25 attended	Principles of geophysical fluid dynamics
	13.30-	UP	Discussion	JPN: Ratna SA: Rautenbach,	Ratna installed GrADS EOF packages on Prof. Rautenbach as he is interested to do some climate analysis.
3/2	10:00-11:00	UWC	Lecture	JPN: Ikeda SA: 30 graduate students and faculties	Climate change and oceanic role
	11:00-12:00	UWC	Lecture	JPN: Nagura SA: 30 graduate students and faculties	Climate variability in the Indian Ocean and the role of the Indonesian

					Throughflow
	12:00-13:00	UWC	Lecture	JPN: Ratna SA: 30 graduate students and faculties	Downscaling of atmospheric models
	14:00-15:00	UWC	Lecture	JPN: Sasaki SA: 30 graduate students and faculties	Coupled ocean-atmosphere model of the equatorial region
3/3	9:00-9:30	UCT	Meeting	JPN: All of the members SA: Neville Sweijd, Michael, Chris Renard, Babatunde, Bruce Hewitson	Plan for this October's lecture series
3/4	11:30-12:30	RU	Lecture	JPN: Ikeda SA: 20 undergraduate and graduate students plus faculties attended.	Climate change and oceanic role
3/4	13:00-14:00	RU	Lunch time meeting	JPN: Ikeda, Miyamoto, Nagura, Sasaki, Ratna SA: David Vousden and Magnus Ngoile	Progress in Agulhas Somali Current Large Marine Ecosystem (ASCLME) project
	14:30-15:30	RU	Lecture	JPN: Nagura SA: 10 attended.	Climate variability in the Indian Ocean and the role of the Indonesian Throughflow
3/7	11:30-12:30	RU	Lecture	JPN: Ikeda SA: 12 attended (3 from Fort Hare University)	Global sea level rise and arctic sea ice variability
	14:30-15:30	RU	Lecture	JPN: Ratna SA: 10 attended (3 from Fort Hare University)	Numerical weather prediction and downscaling
3/8	11:30-12:30	RU	Lecture	JPN: Ikeda SA: 15 attended (3 from Fort Hare University)	Coupled climate-society modeling of a realistic scenario towards sustainable Earth
	14:30-15:30	RU	Lecture	JPN: Sasaki SA: 15 attended (3 from Fort Hare University)	Seasonal forecast based on a coupled ocean-atmosphere model