

Phycological Society of Southern Africa



www.bcb.uwc.ac.za/pssa/

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From the Editor

Welcome to another edition of the PSSA newsletter. Like the many before, this edition is also filled with exciting information from within and beyond the Society. As many of you may be aware, PSSA was well represented at the latest algae-related conference, the XVIII International Seaweed Symposium. Our new president (elect) John Bolton has provided an update of this exciting gathering that took place in June of this year in Bergen, Norway.

The year has come and gone so very quickly and although we won't be seeing each other in January 2005 (see conference countdown), many of us will certainly be attending the 8th Phycological Congress that is to be held in Durban later next year. Please try to attend this conference as we are planning to have our annual general meeting for 2005 at IPC8.

To those who have contributed to this edition of the newsletter, thank you for all your efforts. Please remember to send any and all information you think may be of interest to the society on to your regional collators (details below). Here's wishing you all a blessed and safe festive season.

Northern Areas

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Southern Areas

Enrico Tronchin

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Sincerely
Gavin



Synarthrophyton patena
epiphytic on *Gelidium capense*

Attention All

1. Student Submissions and Prizes

To promote written submissions for the newsletter, R400 is awarded annually for the best popular student article. This is a great way to improve your writing skills. Supervisors, please encourage your students to submit articles. It is disappointing that so few of our student members are offering to participate in this regard.

Guidelines: See the website! Just follow the *Featured Articles* navigational link. Remember, there is R400 up for grabs. As of January 2004, judging of the student articles is by the invited speaker for the annual conference. The award is made at the annual conference banquet. As there is no 2005 conference (see *Conference Countdown*), the award will be carried over to the 2006 conference. Articles should be simple, yet informative. Try to avoid jargon wherever possible.

2. New website address

The Botany and Zoology Departments at the University of the Western Cape have merged to form the new Department of Biodiversity & Conservation Biology. Since the old Botany Dept. was hosting the PSSA website, this has meant that the Society's website address has also changed. The new web address is:

<http://www.bcb.uwc.ac.za/pssa/>. No need to worry, the old web address is still fully functional and both web addresses will load the Society's home page.

3. Contact Details and Research Areas

A number of you have no doubted graduated, moved elsewhere, or had your contact details change. Would you please be so kind as to check all your membership details on the website. A number of members still have very little information pertaining to their areas of interest. We all know you have phycological interests, let us know what your areas of expertise are.



4. Members' Corner/Announcements

- News from the University of Wits

Claudio Marangoni has been very involved in a SANTED project earlier this year, running an undergraduate field course linking UNAM (Windhoek), Wits and UEM (Maputo) at Inhaca Island over a couple of weeks. Claudio really had to put in a huge amount of work to drive the whole thing and ended doing just about everything from ordering all the essential equipment and literature, to devising the course outline and plan the whole programme. It seems from all accounts to have been very successful, despite language differences. It looks like ties between the SADEC countries are beginning to come together (thanks to Norwegian funding). Claudio has also successfully won a position on the highly rated International Oceanographic Commission (IOC) of UNESCO workshop in Copenhagen, identifying Harmful Algae.

Another bit of news is that David Hernandez Becceril from Mexico is planning to undertake part of his sabbatical (September to December 2004) here at Wits with Richard Pienaar and I. David hails from the Institute of Marine and Limnological Science, Universidad Nacional Autonoma de Mexico and has done considerable work on phytoplankton, particularly on the diatoms and dinoflagellates, of Mexico.

Stuart Sym

5. A view of the XVIII International Seaweed Symposium, Bergen, Norway

The International Seaweed Symposia have always had a strong leaning towards applied seaweed research, although in recent years there has always been a good deal of basic research presented also. There is a close link with industry, particularly the phycocolloid industry at these meetings. One exciting aspect of the ISS is that both scientists and industry leaders attend the meetings – unique in the conferences I have attended.

This is the not the first ISS to be held in Norway, the previous one being the second ISS in Trondheim

in 1955. The meeting was attended by about 320 delegates from 45 countries, about the same size as our XVIIth meeting in 2001 in Cape Town. Norway has an enormously dissected coastline, with thousands of islands, and we were told that it has 57 000 km of coastline (I have heard another figure that there are 10 000 km² of rock suitable for the growth of seaweeds). More than 160 000 tonnes of the kelp *Laminaria hyperborea* and over 20 000 tons of the furoid *Ascophyllum nodosum* are harvested in Norway each year, using mechanical methods, for the local production of alginate (see Jensen 1998).



SA delegates enjoying the welcoming reception at the 12th century Viking Hall, the Hakonshallen (left to right – Gavin Maneveldt, Wendy Burnett, Mark Rothman and Robert Anderson).



Following her success in selling seaweed products to seaweed biologists at the XVIIth ISS, Cape Town's own Ilse Gerlach set up her stall in Bergen. Ilse took this photo of South African delegates in front of her wares (Left to right - Robert Anderson, John Bolton, Mark Rothman, Deborah Robertson-Andersson, Gavin Maneveldt & Enrico Tronchin).



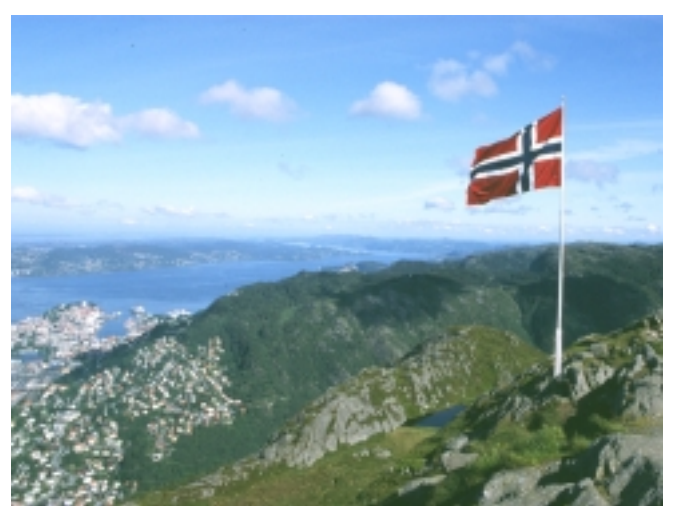
There was an excellent South African contribution to the meeting, with papers from Rob Anderson, Gavin Maneveldt (who also presented a poster of Krishna Naidoo's work), Deborah Robertson-Andersson, Mark Rothman, Wendy Stirk and Enrico Tronchin. I presented a paper on growing *Eucheuma* and *Kappaphycus* in Kenya, part of Joseph Wakibia's almost completed PhD at the University of the Western Cape, which I am co-supervising. All were well received.

A sad African connection at the Opening Ceremony was a moving tribute by Marianne Pedersen to the late Dr. Adeleida Semesi of the University of Dar Es Salaam, Tanzania, who had been a member of the Executive Council of the International Seaweed Association Advisory Committee. The ISA committee is responsible for the organizing of these meetings.

The close South African links of this meeting are that Chief Editor of the Proceedings is Alan Critchley (formerly of the Universities of Natal, Witwatersrand and Namibia, now working for the seaweed company Degussa in France) and the Guest Editor of the Proceedings of the Bergen meeting is our own Rob Anderson of Marine & Coastal Management. Rob had a very hectic time at the meeting, collecting the manuscripts from potential authors of the papers, and also distributing copies to willing and not so willing referees who happened to be present. From 2005, both Alan and Rob will be full members of the ISA committee. Congratulations to both.

Two of the four plenary presentations were locally-based: a review of Scandinavian seaweed research by Jan Rueness and of basic and applied alginate research in Norway by O. Smidsrød. The third plenary was on introduced seaweeds, presented by Britta Schaffelke. This caused a little consternation among the representatives of the seaweed aquaculture industry in the audience. A number of members of the industry (particularly those growing *Eucheuma* and its relatives in the Indo-Pacific) feel a little aggrieved at their deliberate introductions for economic purposes being 'lumped' in publications and presentations which largely document the problems of introduced invasive seaweeds which have been introduced accidentally - an interesting

clash of viewpoints between (some) scientists and seaweed industrialists.



Mount Ulriken, the highest of 7 mountains in Bergen, is a mere 642m above sea level.



South African marine scientist Robert Anderson braves the arctic tundra for a cleaner Norway.



"Oh look, its Bergen!" Enrico Tronchin (left) and John Bolton admiring the view from the top of Mount Ulriken.



The final plenary dealt with “the promising future trend of mariculture”: integrated seaweed culture with animal culture, presented by XG Fei from China. There are increasing numbers of papers on this topic in international seaweed meetings and aquaculture meetings, and it is very relevant, of course, to the growing of seaweeds on our own abalone farms, which is becoming a reality.

The six arranged Mini-Symposia covered the main hot topics, being on aspects of Taxonomy and Phylogenetics, Genomics and molecular genetics, Stress and secondary metabolites, Kelp ecology and global change, and Recent advances in seaweed cultivation techniques. There was also a nicely balanced spread in the other oral presentations, with topics in Biochemistry and colloid chemistry (16%), Biogeography (13%), Ecology (22%), Physiology (16%), Cultivation (14%), Pollution (11%) and Harvesting (7%). A total of 119 posters were also available for viewing.



A highlight of the meeting was a mid-summer celebration - a cruise around the Bergen waterways in the 'Staatsraad Lehmkuhl', Norway's largest and oldest square-rigged sailing ship.

Interesting trends in topics at ISS meetings were the continuing importance of cultivation (which only really became a major topic at the 2001 meeting), as well as the prevalence of kelp studies in this meeting, which was a previous major topic at ISS meetings of the past, but has slipped out of prominence more recently. In particular it was interesting to note the number of papers on the impact of changes in kelp bed structure and distribution in many parts of the world, some from

global environment changes, and others from shifts in grazer populations.

I had rather an interesting perspective on the presented papers, as I was invited by the ISA to Chair the committee assessing student oral presentations. This meant that I missed a lot of papers I would otherwise have chosen to listen too, but I heard some excellent research which I would otherwise have missed. The winning paper (by a long way – top of the list by all the judges) was given by Tatyana Klochkova of the Kongju National University, Korea, on the regeneration of protoplasts from chloroplasts released in extruded protoplasm in *Bryopsis*. This was superb basic research, which is gaining an understanding of protoplast generation which could be critical in tissue culture work (not just on seaweeds). All the South African students did very well (all three of them high up in the ratings, despite the Chair of the committee not being able to vote for them!), with Enrico Tronchin winning the 3rd University of British Columbia student oral prize of US\$ 250. Well done, Enrico!

The XIXth International Seaweed Symposium will take place in Kobe, Japan in 2007.

DID YOU KNOW?: In the marine environment, 44% of annual global aquaculture is provided by seaweeds, 46.2% by mollusks, 8.7% by finfish, 1% by crustaceans, and 0.1% by other animals (FAO 2002, presented by Thierry Chopin, University of New Brunswick, Canada).

Reference:

Jensen, A. 1998. 19. The seaweed resources of Norway. In: Critchley, A.T. & Ohno, O. Seaweed Resources of the World. Japan International Cooperation Agency. 200-209.

John Bolton



Featured Article

South African National Spatial Biodiversity Assessment 2004 - Summary Report

This reports summarises the results and recommendations of South Africa's first National Spatial Biodiversity Assessment (NSBA), led by the South African National Biodiversity Institute (SANBI). A detailed discussion of the methodology and results is presented in the four-volume NSBA Technical Report. In this summary report we have purposefully kept technical detail and references to a minimum.

The NSBA represents South Africa's first national assessment of spatial priorities for conservation action, integrating terrestrial, river, estuarine and marine ecosystems, using available spatial data, biodiversity planning software and a series of expert and stakeholder workshops.



The NSBA deals with four distinct biological environments, the first of which is the **terrestrial** (land) environment.

The NSBA is part of the National Biodiversity Strategy and Action Plan (NBSAP), led by the Department of Environment Affairs and Tourism (DEAT). The development of the NBSAP is part of South Africa's obligations as a signatory to the Convention on Biological Diversity (CBD). It will provide an overarching framework for the conservation and sustainable use of South Africa's biodiversity, and equitable sharing of benefits from use of genetic resources. As far we know, South Africa is the first country to include a

What is biodiversity and why should we be concerned about it?

The term biodiversity refers to genes, species (plants and animals), ecosystems, and landscapes, and the ecological and evolutionary processes that allow these elements of biodiversity to persist over time. South Africa's biodiversity provides an important basis for economic growth and development, in obvious ways such as providing a basis for our fishing industry, rangelands that support commercial and subsistence farming, horticultural and agricultural industry based on indigenous species, our tourism industry, aspects of our film industry, and commercial and non-commercial medicinal applications of indigenous resources. Keeping our biodiversity intact is also vital for ensuring ongoing provision of ecosystem services such as production of clean water through good catchment management, prevention of erosion, carbon storage (to counteract global warming), and clean air. Loss of biodiversity puts aspects of our economy and quality of life at risk, and reduces socio-economic options for future generations.

People are ultimately fully dependent on living, functioning ecosystems and the services they provide. Loss of biodiversity leads to ecosystem degradation and subsequent loss of important services, which tends to harm the rural poor more directly – poor people have limited assets and are more dependent on common property resources for their livelihoods, whilst the wealthy are buffered against loss of ecosystem services by being able to purchase basic necessities and scarce commodities. Our path towards sustainable development, poverty reduction and enhanced human well-being for all, is therefore dependent on how effectively we conserve biodiversity.

comprehensive spatial assessment of biodiversity as part of its NBSAP.

This report is intended to feed into the NBSAP and the National Biodiversity Framework. However, it is also a stand-alone document that can inform the policies, plans and day-to-day activities of a wide range of sectors, both public and private. We hope that the spatial products presented in this report will be widely used and



built upon. A list of their possible applications is included in the appendix. As will be seen from the sections that follow, our focus is on mainstreaming biodiversity priorities throughout the economy, and making links between biodiversity and socio-economic development. In a country like South Africa, with our extraordinary biodiversity resources (see the box below), there is no need to see addressing socio-economic development challenges and conserving biodiversity as opposing goals. Rather, they can reinforce each other, so that conserving biodiversity strengthens our economy and contributes to social development.

Almost every corner of South Africa is packed with valuable biodiversity resources, but because of limited human and financial resources it makes sense to prioritise conservation action on areas of greatest opportunity for linking biodiversity and socio-economic development, and areas where biodiversity is under greatest pressure. This report highlights such areas. Our intention is not to undervalue or dismiss biodiversity in other parts of the country, but simply to provide a systematic way of prioritising short- to medium-term action.

We would like to stress that the NSBA is not in itself a strategy and action plan. It highlights geographic priority areas, which have been fed into the broader NBSAP process. The NBSAP has used these geographic priorities as one way of focusing the development of strategies and action plans.



Freshwater (rivers and wetlands) environments is the second NSBA biological environment.

What is a spatial assessment?

Biodiversity, like people and economic activity, is not evenly distributed across the landscape or seascape, but occurs in greater concentrations in some areas than others. A spatial biodiversity assessment takes these geographic variations into account by mapping information about:

- biodiversity features (such as species, habitats and ecological processes);
- existing protected areas;
- current patterns of land and resource use;
- likely future patterns of land and resource use.

This mapped information can then be analysed using tools linked to a Geographic Information

What's special about South Africa's biodiversity?

South Africa is diverse not simply in terms of our people and culture, but also in terms of our biological resources and ecology. In fact, South Africa is the third most biologically diverse country in the world, after Indonesia and Brazil. The richness of South Africa's biological resources is well documented in the Endangered Wildlife Trust's publication *The Biodiversity of South Africa 2002*, which highlights key facts and figures for different ecoregions within South Africa, including marine and freshwater ecoregions. South Africa occupies about 2% of the world's land area, but is home to nearly 10% of the world's plants and 7% of the reptiles, birds and mammals. We have three globally recognised biodiversity hotspots; the Cape Floristic Region, which falls entirely within our boundaries; the Succulent Karoo, shared with our neighbour Namibia, and Maputaland-Pondoland, shared with Mozambique and Swaziland. (For more on these and other global biodiversity hotspots see www.conservation.org). Our seas straddle three oceans, the Atlantic, the Indian and the Southern Ocean, and include an exceptional range of habitats, from cool-water kelp forests to tropical reefs. The southern African coast is home to almost 15% of known coastal marine species, providing a rich source of nutrition and supporting livelihoods of coastal communities.



System (GIS), to help determine geographic priority areas for action.



The **estuarine** (interface between rivers and sea) environment is the third NSBA biological environment.

Spatial assessments or analyses can take place at different spatial scales, from the global scale to the local scale. A national biodiversity assessment is intended to be broad, and will not yield information about, for example, how to manage an individual parcel of land or a specific river or catchment. A national assessment does provide a national context for assessments at the sub-national scale, and points to broad priority areas where further investigation, planning and action is warranted.

We are fortunate in South Africa to have a strong focus on spatial planning for all sectors at various levels, from the national to the local. We have an excellent National Spatial Development Perspective (NSDP), which establishes principles to guide investment in infrastructure and development spending. At the local level, every municipality must produce an Integrated Development Plan (IDP) that includes a Spatial Development Framework (SDF). This recognition of the importance of spatial planning presents an exciting opportunity to integrate spatial information on biodiversity priorities into crosssectoral spatial plans at different spatial scales.

South Africa's approach to biodiversity planning

South Africa is at the forefront of biodiversity planning internationally, and the methods and

techniques used in this assessment are at the cutting edge of the discipline.

There are several possible approaches to biodiversity planning. The approach used most often in South Africa, including in this assessment, is referred to as systematic biodiversity planning¹. Systematic biodiversity planning is based on three key principles:

- The need to conserve a representative sample of biodiversity pattern, such as species and habitats (the principle of representation);
- The need to conserve the ecological and evolutionary processes that allow biodiversity to persist over time (the principle of persistence);
- The need to set quantitative biodiversity-based targets that tell us how much of each biodiversity feature should be conserved in order to maintain functioning landscapes and seascapes. These targets should ideally be based on best available science, rather than on arbitrarily defined thresholds (such as 10% of all features).

The NSBA is the first ever assessment of biodiversity throughout South Africa. It has four components, dealing with four distinct biological environments:

- terrestrial (land);
- freshwater (rivers and wetlands);
- estuarine (interface between rivers and sea);
- marine (sea).

Systematic biodiversity planning techniques are more advanced for terrestrial environments than for freshwater, estuarine and marine environments. The NSBA is the first attempt we know of to deal with all four environments in one assessment, and has contributed to furthering the application of

¹ For an introduction to systematic biodiversity planning and a review of the South African experience, see Driver, A. Cowling, R.M. & Maze, K. 2003. *Planning for Living Landscapes: Perspectives and Lessons from South Africa*. Washington, DC: Center for Applied Biodiversity Science at Conservation International; Cape Town: Botanical Society of South Africa. Available at www.botanicalsociety.org.za (under Conservation Unit, then Downloads).



systematic planning in freshwater, estuarine and marine environments.

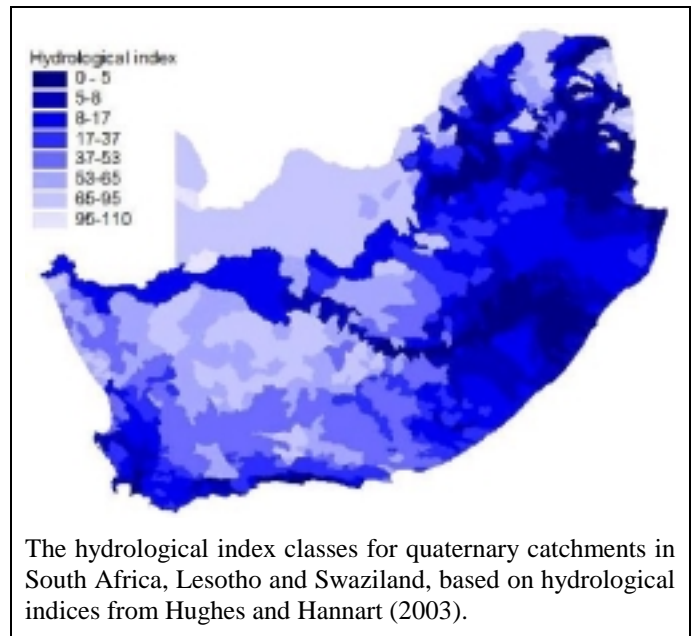


The **marine** (sea) environment is the fourth NSBA biological environment.

Another important aspect of South Africa's approach to biodiversity planning, is a **focus on ecosystems** in addition to species. This is consistent with the Convention on Biological Diversity's ecosystem approach. The single biggest cause of loss of biodiversity in South Africa, and in most of the world, is **loss or degradation of natural habitat and ecosystems**. Other important causes of loss of biodiversity are alien invasive species, which often disrupt ecosystem functioning, and over-extraction of natural resources, especially in the marine environment. Historically, conservation efforts have often focused on individual species, often charismatic ones that catch people's imaginations, such as large mammals. However, the most effective way to conserve the most biodiversity is often to focus on **threatened ecosystems** rather than individual threatened species. Especially in a country like South Africa that has thousands of threatened species, conserving them one by one is unlikely to get us far. We will return to this theme of threatened ecosystems throughout the report.

Driver, A., Maze, K., Lombard, A.T., Nel, J., Rouget, M., Turpie, J.K., Cowling, R.M., Desmet, P., Goodman, P., Harris, J., Jonas, Z., Reyers, B., Sink, K. & Strauss, T. 2004. *South African National Spatial Biodiversity Assessment 2004: Summary Report*. Pretoria: South African National Biodiversity Institute.

(Endangered Wildlife Trust. 2002. *The Biodiversity of South Africa 2002: Indicators, Trends and Human Impacts*. Cape Town: Struik.)



The hydrological index classes for quaternary catchments in South Africa, Lesotho and Swaziland, based on hydrological indices from Hughes and Hannart (2003).

Copies of the summary reports for the terrestrial, freshwater, estuarine and marine environments are available for download on the Society's website.

Conference Countdown

At the PSSA AGM earlier this year we discussed the scheduling of future PSSA Congresses owing to the fact that the PSSA is hosting the 11th International Conference on Harmful Algae [November 2004] and the 8th International Phycological Congress [August 2005]. In addition to these meetings, the Southern African Marine Science Symposium will be held in July 2005. Owing to the interest and commitment of many of our members to the above meetings, the PSSA Executive have proposed that a PSSA AGM is held at the IPC in Durban in 2005, and that the following PSSA Congress be held in July 2006 before reverting to a date in January in 2008. Unless the above suggestion is strongly opposed we will assume that our members are in agreement. John Bolton of UCT will host the July 2006 Congress.

Grant Pitcher
(President of the Society)



Calendar of Events for 2004

Upcoming Conferences

1. Biodiversity, Science and Governance, 24-28 January 2005. Website: <http://www.recherche.gouv.fr/biodiv2005paris/en/index.htm>.
2. The biennial Ground Water Conference, 7-9 March 2005. Website: <http://www.gwd.org.za/>.
3. The 12th Southern African Marine Science Symposium, 4-7 July 2005. Website: <http://www.ori.org.za/samss12/>.
4. A joint meeting of the 59th annual meeting of the Phycological Society of America and the 8th International Phycological Congress (IPC8), 13-19 August 2005. Website: <http://www.ipc8.org.za/>.
5. The XIX International Seaweed Symposium, Kobe, Japan, 2007.

