

# DRAFT Preparation Form for Proposed IPY Activity

This WORD template is to assist in developing an agreed document for submission to IPY by June 30, 2005. Submissions to the IPO are to be made ONLY via the online version of this form which will be available at [www.ipy.org](http://www.ipy.org).

## 1.0 PROPOSER INFORMATION

### 1.1 Title of Activity

**Pacific-Antarctic influence on the Atlantic side of the Magellan Strait: Long term monitoring of Patagonian microbial communities at ca. 52°S.**

### 1.2 Short Form Title of Proposed Activity

**PAMPA**

### 1.3 Activity Leader Details

Surname	
Viviana Andrea	Alder
Affiliation	
Instituto Antártico Argentino, Universidad de Buenos Aires, CONICET	Country
	Argentina

### 1.4 Lead International Organisation(s) (if applicable)


### Other Countries involved in the activity

#### 1.5

It is important that each activity demonstrate that there is internationalisation. Components of IPY activities can be operating at simply a national level but should synchronize with comparable groups in other nations activities to ensure internationalization at the IPY activity (core project) level.

GERMANY	SPAIN	USA	

### 1.6 Expression of Intent ID #'s brought together in the proposed activity(Lead first)

???	71?								

### 1.7 Location of Field Activities (Arctic, Antarctic or Bipolar)

**ANTARCTIC**

### 1.8 Which IPY themes are addressed (insert X where appropriate)

1. Current state of the environment	X	4. Exploring new frontiers	X
2. Change in the polar regions	X	5. The polar regions as vantage points	X
3. Polar-global linkages/tele-connections	X	6. The human dimension in polar regions	X

**1.9 What is the main IPY target addressed by this activity (insert X for 1 choice)**

1. Natural or social science	X	3. Education, Outreach, Communication	
2. Data management		4. Legacy	

## 2.0 SUMMARY OF THE ACTIVITY (*maximum of 1 page A4*)

Multidisciplinary, international efforts have led to a fair knowledge of microbial communities (pico-, nano- and microplankton) as to their structure, abundance, and processes involved in the global carbon cycle. Advanced, exhaustive studies on this field have been encouraged in many different sectors of the World Ocean, including those of difficult access such as the Antarctic. Curiously, for a few geographic areas adjacent to the latter region and under its strong, direct influence, studies of this kind are only in their initial stages. Such is the case of the Argentine shelf, which is characterized both by being one of the widest in the world and by its high diversity of marine ecosystems. In terms of dynamic processes (removal of CO<sub>2</sub> from the atmosphere through photosynthesis, nutrient recycling, coupling of phytoplanktonic and bacterioplanktonic production, food web interactions, transport of species by currents), this lack of knowledge prevents from establishing links and comparisons with adjacent oceanic regions (e.g., Southern Ocean, SE Pacific), as well as from constructing ecosystem models aimed to predict the patterns of carbon flux, among other limitations. Previous results from latitudinal transects extending from the Argentine shelf to the Southern Ocean during austral summer revealed that South Patagonian waters (mainly those along the coast of the Santa Cruz Province) favour the development of an extremely rich pseudo-estuarine ecosystem hosting high microbial and heterotrophic biomasses. These waters are under the influence of (1) nutrient-enriched Circumpolar waters, (2) a tongue of low-salinity, subantarctic waters proceeding from the Strait of Magellan (the most important choke point between the Atlantic and Pacific) and the Cape Horn Current, and extending northward up to 47°S, (3) frontal processes, and (4) human impact due to exploitation of living and non-living resources. Moreover, while the Atlantic side of the Magellan Strait exhibits the world's second largest tidal ranges, the Pacific end receives the direct effect from glacial continental ice melting during summer. Given the implications of this particular sector in local carbon fluxes, marine fisheries and Global Change, further critical questions arise: *Is the Pacific-Atlantic link a potential catalyst of microbial activity on the Atlantic side of the Magellan Strait? Which are the environmental factors causing and regulating such high productivity levels? Is this phenomenon permanent, occasional or seasonal? To what degree do these unexpectedly high heterotrophic biomasses contribute to the local carbon flux and to Global Change? Which are the relationships between food-web structure, organic matter fluxes and climatic variability (e.g., ENSO)? What is the magnitude and fate of primary and secondary production in this area and how will it change as global temperature increases and atmospheric ozone becomes further depleted?* These important questions need to be answered in the forthcoming years in order to understand both the dynamics of this unique environment and the connections between Polar and mid-latitude ecosystems (for instance, how and to what extent “open-ocean” Drake Passage waters impact on this environment, and how this impact compares with that caused by the “protected” chokepoint of the Magellan Strait, directly influenced by the ENSO cycles). As a starting point for this ample research field, the present project intends to initiate a long-term monitoring of microscopic communities and their role in biogeochemical cycles through a Time Series Station in neritic Patagonian waters (ca. 52°S). Such a station will be the core of *in situ* and experimental studies on seasonal and interannual variability of the local microbial community structure, cell size and abundance, key species and functional groups, red tides, alternation between bacterioplankton and net phytoplankton dominance, etc. Data will be analyzed in relation to the main physico-chemical and geological constraints of the sector (temperature and salinity fluctuations, wind, turbulence, local tidal ranges, re-suspension processes, land-coast and plankton-benthos-sediment interactions, quality, origin and concentration of DOM and POM, organic and inorganic nutrients, DO, pH, chlorophyll, among others) as well as to meso-scale phenomena such as ENSO (actual and past conditions). This approach is expected to help in the understanding of coastal ecosystem responses to natural and anthropogenic changes and to promote the development of disciplines such as Aquatic Microbial Ecology and Marine Biogeochemistry in the young generation of scientists.

**2.1 What is the evidence of inter-disciplinarity in this activity?**

Initially, the activity will involve oceanographers, geologists, chemists, imaging and microscopy experts, and biologists from a wide range of disciplines (microbiology, physiology, phycology, molecular biology, planktology, etc.). Meteorologists and limnologists will be incorporated during the execution of the project. Besides its scientific objectives, the activity entails a strong interaction with education experts who will implement local educative programmes focused on the conservation of aquatic ecosystems.

**2.2 What will be the significant advances/developments from this activity? What will be the major deliverables, including the outputs for your peers?**

Results from PAMPA regarding general structure of southern Patagonian microbial communities (“fragile” pico- and nanoplankton vs. “protected” microplankton), their role in biogeochemical cycles, abundance of key species, and relationships with environmental dynamics are expected to yield the first answers to questions posed in Point 2. Seasonal dynamics of heterotrophic bacterioplankton, cyanobacteria, eukaryotic pico-, nano- and microalgae, flagellates, ciliates and other microzooplankters (including metazoan larvae) will be analyzed in order to detect microbial drivers of biogeochemical processes, understand dynamics at the base of the local food web, and the community response to short scale (e.g. tidal fluctuations, wind intensity) and mesoscale (ENSO) environmental changes in one of the richest though scarcely known ecosystems within Patagonian waters. Complementation of PAMPA data with existing information obtained during 2002-2006 will allow increasing the interannual summer data series. This future database will be of vital importance to national and international decision makers dealing with conservation and management of the area, as well as for the construction of predictive models in fisheries and climate, among several others. New species from the TSS will form part of a database to be further developed and kept at UNPA (Río Gallegos, Argentina), in the vicinity of Ushuaia (Tierra del Fuego, Argentina) and Punta Arenas (Chile), sites which are regularly visited by marine microbiologists from different parts of the world on their way to Antarctica. This situation will hopefully help the interchange among international experts in the microbial field. The new field station will constitute a vantage point for the comparison of microbial dynamics between Antarctic and Subantarctic environments. Scientific publications will be the rule for publishing the results stemming from the project.

**2.3 Outline the geographical location(s) for the proposed field work (approximate coordinates will be helpful if possible)**

IPY activities should be polar-focussed (not necessarily located in polar regions. These fields should identify one or more areas where field activities will occur, e.g. West Antarctic Ice Sheet, Weddell Sea, Svalbard, Greenland. There is no need to include reference to Antarctica or Arctic (picked up in 1.7). If approximate coordinates are available this will allow distribution maps to be generated for IPY planning and promotional activities and assist logistic operators. An IPY activity does not have to include a field component but will do so in most cases.

Location(s)	Coordinates
South Patagonian (inner-intermediate) coastal waters	51.3-53°S, 68-69°W

**2.4 Define the approximate timeframe(s) for proposed field activities?**

Arctic Fieldwork time frame(s)	Antarctic Fieldwork time frame(s)
mm/yy – mm/yy	2006-2010

**2.5 What major logistic support/facilities will be required for this project? (see notes)**

New field station	
Helicopters	

<p><b>Further details</b> – A Navy patrol ship will be reconditioned for basic scientific purposes. The Argentine research vessel Puerto Deseado will be available during its summer travel to Antarctica for the collection of plankton and sediment core samples at the entrance of the Strait of Magellan and along the coast of Santa Cruz.</p>	

**2.6 How will the required logistics be supplied? Have operators been approached?**

Source of logistic support	X for likely potential sources	X where support agreed
Consortium of national polar operators		
Own national polar operator		
Another national polar operator		
National agency	X	
Military support		
Commercial operator		X
Own support		X
Other sources of support (details). See 3.10		X

**2.7 If working in the Arctic regions, has there been contact with local indigenous groups or relevant authorities regarding access?**

No.
-----

**3.0 STRUCTURE OF THE ACTIVITY**

**3.1 Origin of the activity (X for one choice)**

Is this a new activity developed for the IPY period?	
Is this activity the start of a new programme that will outlive IPY?	
Is this a pulse of activity during 2007-2009 within an existing programme?	X
<p>This activity falls partially within an existing project to be started during 2006: <i>Microbial communities and organic matter in the water column and sediments of southern Patagonian waters</i>. During IPY there will be a pulse of this activity centred in the establishment of a Time Series Station for the monitoring of communities.</p>	

**3.2 How will the activity be organised and managed? Describe the proposed management structure and means for coordinating across the cluster**

<p>The structure of the project will be based primarily on:</p> <p><b>Project Committee (PC):</b> It will be conformed by scientists and authorities from the Santa Cruz Government, private companies, Universidad Nacional de la Patagonia Austral (UNPA), and the Instituto Antartico Argentino - Dirección Nacional del Antártico. During 2006, the main task will be the planning and establishment of the Time Series Station (TSS), and the reconditioning of a patrol ship to be loaned by the Santa Cruz Government.</p> <p><b>Principal Investigators (PI):</b> Valuable experience and knowledge in several different fields will gradually be transferred to students by the leading local / international scientists involved in the project, according to an appropriate schedule still to be established, probably starting during 2007. PI will be in charge of each of the disciplines covered by the project, for instance, field and laboratory activities, data management, formation of human resources, and organization of special graduate/postgraduate courses to be held at UNPA. Previous transfer of tested methodologies and of all preliminary results for Argentine shelf waters will facilitate obtaining early results from the Time Series Station.</p> <p><b>Young Scientists (YS):</b> PhD students and postgraduates will collaborate in field sampling and the processing of materials. They will also act as teaching assistants for special courses on Marine Microbial Ecology to be given at UNPA.</p> <p>The Scientific Plan will extend from 2006 to 2010, and will tentatively comprise: During 2007, bimonthly field sampling (vertical profiles of oceanographic bottles, nets and sediments samples)</p>
--

of the microbial communities, collection of sediments and biotic/abiotic data in inner (0-50 m depth) coastal waters. Additional samples will be taken at the Atlantic side of the Strait of Magellan from oceanic platforms belonging to private oil companies. Samples will be examined by both PI and YS at laboratories of Universidad Nacional de la Patagonia Austral (UNPA) and Universidad de Buenos Aires (UBA). A new team of researchers will be adequately trained quasi simultaneously. Experimental studies on rates of phytoplanktonic and bacterioplanktonic production and grazing will start in 2008. Sampling design will be centered on inner waters (0-50m) will be properly adapted after the analysis of samples from the first annual cycle. Biodiversity will be particularly focused on: 1) Diatom species from planktonic vs. benthonic habitats (water column and sediments, respectively) and indicators from core sediments for paleo-reconstruction of "El Nino" events. These analyses will be performed in collaboration with scientist from Spain and Germany; 2) Planktonic ciliate (aloricate and loricate) species will be examined by comparison of their morphology and cytology, as well as by molecular techniques in collaboration with scientist from USA. Biogenic silica (as a tracer of net-phytoplankton productivity), dissolved organic matter (DOM), dissolved organic nitrogen (DON) and spectroscopic properties of amino acids (proxy for bacterial activity) will be measured at ZMT (Germany) by young Argentine scientists as part of the project's plan of formation of human resources. Installation of a sediment trap in the area (currently being negotiated with Germany) will provide a more complete picture of the particle flux in the area.

**3.3 Will the activity leave a legacy of infrastructure and if so in what form?**

Legacy is a crucial aspect of the present project. Despite having the most extended coastline among Argentine provinces, Santa Cruz lacks at present an institution dealing with marine research. The establishment of a Time Series Station is thus expected to provide a platform of study that (1) will help to increase the number of projects and scientist involved in the area, and (2) will hopefully become the foundation stone of a Santa Cruz Marine Research Centre, which will mean a new source of work for young generations of scientists.

**3.4 Will the activity involve nations other than traditional polar nations? How will this be addressed?**

No.

**3.5 Will this activity be linked with other IPY core activities? If yes please specify**

The present activity would contribute to several IPY clusters, such as AMES, CAML, EBA-SCAR. According to the IPY chart, the project will probably be related as well with bipolar (35 Ocean biogeochemical cycles) and polar clusters (92: Climate & Ecosystem Dynamic; 34: Marine and terrestrial communities). It will also be complementary to Drake Bioseas (EoI 192) because of the influence of the Drake Passage on southern Patagonian waters.

**3.6 How will the activity manage its data? Is there a viable plan and which data management organisations/structures will be involved?**

Organization of a database at UNPA will be in charge of both PI and YS (see Point 2.2). PI will have the responsibility of making data available to the project leader for further transfer to IPY. Interchange of microscopy images will contribute to species identification and be used for comparing specimens from other areas.

**3.7 Data Policy Agreement (Place X in box for agreement)**

Will this activity sign up to the IPY Data Policy (see website)	X
---	---

**3.8 How will the activity contribute to developing the next generation of polar scientists, logisticians, etc.?**

The fact that PAMPA is an international project to be developed within IPY framework will motivate young PhD students to play an active role and to acquire a higher level of commitment with the field of research. On the other hand, the Atlantic side of the Strait of Magellan is characterized by quite adverse meteorological conditions for navigation, because of which the students are expected to gain a valuable experience in the manipulation of equipment and in sampling operations. The gradual establishment of the TSS will probably be accomplished by a simultaneous development of a new staff of technicians and logisticians.

**3.9 How will this activity address education, outreach and communication issues outlined in the Framework document?**

Santa Cruz authorities have recognized the project as being of special interest for the province, and have expressed their commitment for cooperation. Thus, as a priority, a special educative programme (“The WATER, the FUTURE”) will be planned by the Consejo Provincial de Educacion (Provincial Education Council) jointly with PAMPA scientists during 2006, for its execution at local schools and colleges during IPY. Said programme will focus on the relevance of the IPY event, Global Change awareness, and the study of aquatic microbial communities. Publications in native language are considered an important issue for local outreach.

**3.10 What are the proposed sources of funding for this activity?**

The project will have different sources of financial support. Funds currently available and aimed for the ecological study of microbial communities and biogeochemical cycles of the area will be used for the acquisition of basic field and laboratory equipment. Governmental institutions of the Santa Cruz Province have pledged themselves to freely provide existing data on local meteorological conditions and tidal ranges, and a patrol ship (to be reconditioned) with its crew for field sampling. Transportation of students and scientist by helicopter to oil platforms on the Atlantic side of the Strait of Magellan will be in charge of oil companies. Further financial support will be requested to local funding institutions (CONICET, SECYT) in order to assure the continuity of the TSS.

**3.11 Additional Comments**

--

**4.0 CONSORTIUM INFORMATION**

**4.1 Contact Details**

	Lead Contact	Second Contact
Title	Dr.	Dr.
First Name	VIVIANA ANDREA	SERGIO
Surname	ALDER	MARENSSI
Organisation	INSTITUTO ANTÁRTICO ARGENTINO	INSTITUTO ANTÁRTICO ARGENTINO
Address	CERRITO 1248	CERRITO 1248
Postcode/ZIP	1010 BUENOS AIRES	1010 BUENOS AIRES
Country	ARGENTINA	ARGENTINA
Telephone	54 11 4783 4844	54 11 4813 7807/ 4816 6271
Mobile	-----	-----
Fax	54 11 4813 7807	54 11 4813 7807
Email	<a href="mailto:viviana@ege.fcen.uba.ar">viviana@ege.fcen.uba.ar</a>	<a href="mailto:smarensi@dna.gov.ar">smarensi@dna.gov.ar</a>
Repeat Email	<a href="mailto:viviana@ege.fcen.uba.ar">viviana@ege.fcen.uba.ar</a>	<a href="mailto:smarensi@dna.gov.ar">smarensi@dna.gov.ar</a>

--	--	--

#### 4.2 Other significant consortium members and their affiliation

Name	Organisation	Country
Oscar Romero <a href="mailto:oscarr@ugr.es">oscarr@ugr.es</a>	Universidad de Granada (UGR), Granada	Spain
George McManus <a href="mailto:george.mcmanus@uconn.edu">george.mcmanus@uconn.edu</a>	Depart. of Marine Sciences, University of Connecticut, Groton	USA
Zulma Lizarralde <a href="mailto:zlizarralde@uarg.unpa.edu.ar">zlizarralde@uarg.unpa.edu.ar</a>	Universidad Nacional de la Patagonia Austral (UNPA), Río Gallegos	Argentina
Ingrid Bordoni <a href="mailto:ingridbordoni@yahoo.com.ar">ingridbordoni@yahoo.com.ar</a>	Consejo Provincial de Educación, Río Gallegos	Argentina
Mariano Memolli <a href="mailto:mmemolli@dna.gov.ar">mmemolli@dna.gov.ar</a>	Dirección Nacional del Antártico, Bs. As.	Argentina
Rubén Lara <a href="mailto:ruben.lara@zmt-bremen.de">ruben.lara@zmt-bremen.de</a>	Centre for Tropical Marine Ecology (ZMT), Bremen	Germany
Gerhard Kattner <a href="mailto:gkattner@awi-bremerhaven.de">gkattner@awi-bremerhaven.de</a>	Alfred Wegener Institute for Polar and Marine Research (AWI), Bremerhaffen	Germany
Dieter Peterke <a href="mailto:dpeterke@zmt-bremen.de">dpeterke@zmt-bremen.de</a>	Centre for Tropical Marine Ecology (ZMT), Bremen	Germany
Eleonora Uliana <a href="mailto:eleonora_u@yahoo.com">eleonora_u@yahoo.com</a>	Post-graduate candidate, Bremen	Germany
Enrique L. Portiansky <a href="mailto:elporti@fcv.unlp.edu.ar">elporti@fcv.unlp.edu.ar</a>	Fac. Cs. Veterinarias, Universidad Nacional de La Plata (UNLP), La Plata	Argentina
Hermes Mianzán <a href="mailto:hermes@inidep.edu.ar">hermes@inidep.edu.ar</a>	Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP), CONICET, Mar del Plata	Argentina
Mariela Kogan <a href="mailto:mkogan@inidep.edu.ar">mkogan@inidep.edu.ar</a>	Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP), CONICET, Mar del Plata	Argentina
Horacio Mazzoni <a href="mailto:horacio.mazzoni@fibertel.com.ar">horacio.mazzoni@fibertel.com.ar</a>	Private company	Argentina
Gustavo Thompson <a href="mailto:gustavo@bg.fcen.uba.ar">gustavo@bg.fcen.uba.ar</a>	Fac. Cs. Exactas y Naturales, Universidad de Buenos Aires (UBA), Bs. As.	Argentina
Héctor Olguín Salinas <a href="mailto:holguin@ege.fcen.uba.ar">holguin@ege.fcen.uba.ar</a>	Fac. Cs. Exactas y Naturales, Universidad de Buenos Aires (UBA), Bs. As.	Argentina
María Inés Gómez <a href="mailto:ine_gomez@yahoo.com.ar">ine_gomez@yahoo.com.ar</a>	Fac. Cs. Exactas y Naturales, Universidad de Buenos Aires (UBA), CONICET, Bs. As.	Argentina
Santoferrara, Luciana <a href="mailto:lusantoferrara@ege.fcen.uba.ar">lusantoferrara@ege.fcen.uba.ar</a>	Fac. Cs. Exactas y Naturales, Universidad de Buenos Aires (UBA), CONICET, Bs. As.	Argentina
Franzosi, Claudio <a href="mailto:claudiofranzosi@yahoo.com.ar">claudiofranzosi@yahoo.com.ar</a>	Fac. Cs. Exactas y Naturales, Universidad de Buenos Aires (UBA), Bs. As.	Argentina

Flavio Papparazzo <a href="mailto:paparazzo@cenpat.edu.ar">paparazzo@cenpat.edu.ar</a>	Universidad de Buenos Aires (UBA), CENPAT-CONICET, Puerto Madryn	Argentina
Centurión Araujo, Patricia <a href="mailto:pato_centu@yahoo.com">pato_centu@yahoo.com</a>	Fac. Cs. Exactas y Naturales, Universidad de Buenos Aires (UBA), Bs. As.	Argentina
Sergio Santillana <a href="mailto:ssantillana@dna.gov.ar">ssantillana@dna.gov.ar</a>	Instituto Antártico Argentino (IAA), UBA, Bs. As.	Argentina
Guillermo Visbeek <a href="mailto:postmast@odinof.cyt.edu.ar">postmast@odinof.cyt.edu.ar</a>	Instituto Antártico Argentino (IAA), UBA	Argentina
María Marquez <a href="mailto:mitsuki@dna.gov.ar">mitsuki@dna.gov.ar</a>	Instituto Antártico Argentino (IAA), UBA, Bs. As.	Argentina
Martín Ansaldo <a href="mailto:tincho@bg.fcen.uba.ar">tincho@bg.fcen.uba.ar</a>	Instituto Antártico Argentino (IAA), UBA, Bs. As.	Argentina
Estela Dinofrio <a href="mailto:estelin2@yahoo.com.ar">estelin2@yahoo.com.ar</a>	Instituto Antártico Argentino (IAA), Bs. As.	Argentina