November, 13, 2009

To
Department of Sustainable Development
Organization of American States
1889 F. St., N.W., Suite 773-C
Washington, D.C. 20006
c/o: Mr. Richard M. Huber; Mrs. Luisa Fernanda Neira

Dear Sir/Madam

Please find attached our proposal for the THIRD REQUEST FOR PROPOSALS (RFPs) for the Development of Value-Added Tools for Decision-Making.

Our proposal, whose title is Mapping the Economic Value of Pollinator Services, **aims at developing a tool to model and present the economic value of pollinator services.**

Please feel free to contact me in case any other clarifications are necessary.

Prof. Antonio Mauro Saraiva
Universidade de São Paulo
Fundacao de Apoio a Universidade de São Paulo

A. Title of Proposed Project :
Mapping the Economic Value of Pollinator Services

B. Cover letter signed by the authorized representative of the firm.
As attached.

C. Contact Information of the Firm
- Name of Firm: Fundação de Apoio a Universidade de Sao Paulo – Agricultural Automation Laboratory
- Name of Contact Person(s): prof. Antonio Mauro Saraiva
- Address: Av. Afranio Peixoto, 14. Butanta, Sao Paulo, SP
- Country: Brazil
- Telephone: 55 11 3091 4289
- Fax: 55 11 3091 4289
- Email: saraiva@usp.br
- Website:www.fusp.org.br

D. (In case of association) Contact information of Associated Firm(s)
- Name of Firm:
- Name of Contact Person(s):
- Address:
- Country:
- Telephone:
- Fax:
- Email:
- Website:

E. Project Summary: An abstract of the proposal (200 words or less) both in English and Spanish. It should include the title of the project, geographic location, a brief description of the rationale, goal(s), objectives, specific project activities, target decision-makers, beneficiaries, and expected products.

Mapping the Economic Value of Pollinator Services

The tool that we propose to develop, the POllinator Economics Mapper (POEM), will combine the economic valuation of pollinator services with mapping applications to produce statistical and visual representations of the importance of pollinators for a geographical unit (e.g., state, province, country, or region). The tool is in direct response to an identified need by CBD to assess the economic value of pollinators, through economic analysis of data from various crop pollinator-pollination systems. It will be web-based and illustrate the economic value (relative or actual) of pollinators to a particular geographic area. POEM will be useful for analyses and reports required by national and international agreements and bodies and be accessible in English, Spanish, Portuguese and French, The project will follow a typical software development process and its main phases and activities. Among the main users envisioned for the system are policy and decision makers, education, researchers, farmers who need data and facts that depict the value of pollination. We will also attempt to integrate the tool and its data content with the other IABIN thematic networks and the IABIN catalog.

Mapeando el Valor Económico de los servicios de polinizadores

La herramienta que proponemos desarrollar, the POllinator Economics Mapper (POEM), va a combinar la valuación económica de los servicios de polinizadores con aplicaciones de mapas para producir estadísticas y presentaciones visuales de la importancia de los polinizadores para una unidad geográfica (por ejemplo una provincia, un estado, país o región). La herramienta es una respuesta directa a una necesidad identificada por la CDB para evaluar el valor económico de los polinizadores, a través de análisis económicos de datos de varios sistemas de polinizador-polinización de culturas agrícolas. Será basado en la web e ilustrará el valor económico (relativo o real) de polinizadores para un área geográfica particular. POEM será útil para los análisis y reportes requeridos por organizaciones y acuerdos internacionales y nacionales y estará disponible en Inglés, Español, Portugués y Francés. El proyecto seguirá un proceso de desarrollo de software típico en sus fases y actividades principales. Entre los usuarios principales pretendidos están los tomadores de decisión y políticos, educadores, investigadores, productores agrícolas que necesitan datos y hechos que muestran el valor de la polinización. Vamos también a intentar integrar la herramienta y sus datos con otras redes temáticas de IABIN y su Catálogo.

F. Project description (Maximum sixteen pages) - A description of the proposed outcome (product) of the project. This should follow a basic scientific proposal content in which the following questions are addressed: what is proposed and its relevance (objectives and relevance), how this will be done (methodology), what will be achieved, what outputs will be delivered, what innovation will be generated, how the project success will be measured (in keeping with IABIN project monitoring and evaluation methodology). This should be developed in the format below:

1. **Rationale**: Describe the project's value to IABIN; why it is important that this project be implemented (e.g., which commonly recognized need in the region or sub-region is addressed by the proposal). Describe any overlap or complementarities with existing tools to support decision-making developed by your organization or others and how this could be used, modified or adapted to IABIN community needs. Describe how this proposal will fill existing gaps.

The tool that we propose to develop, the POllinator Economics Mapper (POEM), will combine the economic valuation of pollinator services with mapping applications to produce statistical and visual representations of the importance of pollinators for a geographical unit (e.g., state, province, country, or region).

The problem of declining pollinator services is important globally and to the countries of the Americas. It has been the subject of the Convention on Biological Diversity International Pollinators Initiative, IABIN Pollinator Thematic Network, National Academies of the United States, and the Brazilian Pollinator Initiative, among others. Several countries, including the United States, Canada, Brazil, Costa Rica, Mexico, and Panama, have cited the declining pollinator issue in reports and case studies to the Convention on Biological Diversity (1).

Pollinators are important to agricultural crops, native plant propagation, and to proper ecosystem functioning. Eighty percent of the world's flowering plants and two-thirds of the major crop plants are dependent on animal pollinators. As the many initiatives on pollinators move forward, it is becoming increasingly important to define their important service in economic terms at the in-country, country, and international levels.   The International Pollinator Initiative recognizes the need to "assess the economic value of pollinators, including evaluation, in economic terms, of different crop-pollinator-pollination systems for optimal use of pollinators in sustainable agricultural systems, through economic analysis of data from various crop pollinator-pollination systems". The development of POEM is a direct response to this need and will have applicability and capacity-building value well beyond the Americas.

2. **Project Goals and Objectives:** Project goals must be clearly defined and directly relevant to the need(s) identified above. Project objectives must be measurable, realistic (attainable within the project's period of performance), and be directly relevant to the goals identified.
   A) Produce a web-based tool that illustrates the economic value (relative or actual) of pollinators to a particular geographic area.
      a. Include standard economic data from standard sources as input (e.g., FAO, USDA, EMBRAPA).

b. Calculate the economic value of pollination for a set of crops using a methodology proposed on the scientific literature and supported by FAO (2)(3).
c. Use open source GIS software and data layers to exhibit economic and statistical data in a mapping format.

B) Make the outputs of the tool directly useful for analyses and reports required by national and international agreements and bodies.
a. Make the tool as user-friendly and intuitive as possible with standard output data that is relevant to national and international agreements and bodies.
b. Make the tool accessible in a multi-lingual format including English, Spanish, Portuguese, and French.

3. **Project Activities and Methodologies:** Discuss in detail all proposed project activities and describe the methodologies to be used to implement the objectives. In this section you should explain your understanding of the objectives of the assignment, approach to the services, methodology for carrying out the activities and obtaining the expected output, and the degree of detail of such output. You should highlight the problems being addressed and their importance, and explain the technical approach you would adopt to address them.

The project will follow a typical software development process and its main phases and activities.

Analysis – in this phase a detailed analysis of the problem will be conducted, in order to define the requirements to be met. Although this has already been done to some extent to provide the basis to the proposal, it is necessary to go into a more in-depth analysis of the data sources, potential users, other systems and thematic networks with which our system will potentially interconnect, and methods for interconnection.
Data sources and elements: the primary source for economic data to be used will be FAO, and its FAOSTAT system (4) that will provide us data at the national level for production and price on a yearly basis for the list of 133 crops given in table 1, which are defined by FAO as being used directly for human food. We will also investigate other data sources for crop production and price at an in-country level at least for Brazil and the USA. This would allow us to increase the level of detail to which the analysis will be done. We will also define the measurement units to be used. One problem to be addressed here is the quality of the data, its regularity and availability.
Potential users and interface requirements: among the main users envisioned for the system are policy and decision makers, education, researchers, farmers who need data and facts that depict the value of pollination. In order to identify their needs in terms of data outputs, formats and user-interface a limited number of interviews will be conducted. This will include communications with the focal point of IABIN in Brazil . One main issue to be addressed here is to make the system as user-friendly as possible while providing valuable results at the click of a button.

Interconnection/integration with other systems: this topic will explore systems that can interoperate with this tool to provide and/or consume data directly, especially in the form of webservices. We will contact IABIN networks Geospatial, Invasive, Species&specimens, as well as Pollinators to identify map layers that they can provide to be added to the tool and enhance the analyses. Potential layers to be explored are maps of protected areas in a region or country (to evaluate the potential habitat areas for pollinators important for crop pollination), diverse geospatial layers such as political division, land use, elevation (which can be used to refine analysis), and occurrence of species and specimens, native and invasive (to evaluate the existence of native or introduced pollinators and their potential role).

On the other direction we will identify the data that our system can provide to other IABIN networks and the catalog.

Also the FAO system as well as the national data sources in US and Brazil will be analyzed and contacted to evaluate the possibility of a direct integration between systems.

All these possibilities will be analyzed and depending on the availability these layers will be incorporated to the tool or provided by it in this first implementation or will be proposed for future versions.

One problem to be addressed here is the availability of interfaces on those systems, preferably web services, to allow interoperation, and the compliance of those interfaces to IABIN standards such as OGC-compliant services.

Project – In this phase the requirements defined in the previous phase will be used to specify: the system architecture, a detailed project of the database, the economic valuation model, and the user interface. Use cases modeling will be used to define the functionalities and guide the development of the user interface. The interface with other systems identified to be feasible within the scope of this project will be detailed.

Implementation – in this phase the software will be coded and the individual modules will be tested.

Testing – in this phase the system will be tested as an integrated system against the functionalities defined in the analysis phase and corrected as needed.

Documentation – this activity will be developed along the whole process and will include a user manual in the four IABIN languages.

4. **Time frame / work plan:** Indicate when activities, tasks, and milestones or outputs will be accomplished, as well as responsible person, and monitoring and evaluation mechanism (based on the stated anticipated benefits and outputs and assurance that the products will reach the intended beneficiaries). In general, projects should last no more than six months. The proposed work plan should be consistent with the technical approach and methodology, showing understanding of the TOR and ability to translate them into a feasible working plan. A list of the final documents, including reports, drawings, and tables to be delivered as final output, should be included here.

The activities will be accomplished according to the schedule below which is in accordance with the Deliverables and Timetable of the TOR.

As the project is proposed to be developed in a short period, the methodology to be adopted will be to develop intensive but short analysis and project phases to allow us to proceed to rapid prototyping of the system and then evolve incrementally adding new functionalities as the previous are accepted.

The task assignment table (item 5) provides a broad view of the activities to be developed by each member and hence their responsibilities.

The monitoring and evaluation mechanism during the development will be the deliverables themselves which are frequent and detailed enough to permit following the development.

A list of the final documents at this point is:
- Progress reports (1 and 2)
- Final Report
- System analysis document
- Manual and user guide (in four languages)
- Other more detailed documents, such as database model, and code documentation will be defined during the analysis phase.

Phase or activity	Period	Deliverables
Analysis	1st Month	Analysis document with use cases, architecture and standards. 1st progress report (PR)
Project	2nd Month	Database model, prototype of the user interface. 2nd progress report
Implementation	3rd to 6st month	Beta version of the tool (4th month). Demonstration events (6th month).
Testing	5th & 6th Months	Tool tested and developed according to the system analysis document.
Documentation	1st to 6th month	1st PR (1st month), 2nd PR (2nd month). Draft manual (5th month), Manual and user guide, Final report and system documentation completed. (6th month)

5. **Team Composition and Task Assignment:** Indicate the structure and composition of your team. List the name of staff, firm, area of expertise, position assigned, and task assigned.

Name	Firm	Expertise or background	Position	Tasks
Antonio Mauro Saraiva	USP(FUSP)	IT applied to agriculture and environment	PI	General coordination, system analysis
Michael Ruggiero	ITIS	Pollinators and Pollination	Co-PI	system functional specification and testing supervision
Pedro Correa	USP	Computer Scientist,	Development Management	System specification, architecture, and development management
Etienne Cartolano Jr	USP(FUSP)	Computer engineer	Software developer	System analysis and project, Database design and implementation, Web services design,
Jorge Teles	USP(FUSP)	System analyst	Software developer (Junior)	Mapping capabilities design and implementation
Diogo Borges Krobath	USP(FUSP)	Computer eng undergrad student	Software developer (Intern)	Web services implementation
Rafael Yukio Kanaoka	USP(FUSP)	System analysis undergrad student	Software developer (Intern)	User interface implementation
Aline Iuri	USP(FUSP)	Designer	Designer	User interface design

6. **CVs of Proposed Staff:** In addition to the general information about the individual, it would be helpful to have work undertaken by the individual that best illustrates capability to handle the tasks assigned.

See Attached

7. **Staffing Schedule:** For Professional Staff the input should be indicated individually; for Support Staff it should be indicated by category (e.g.: draftsmen, clerical staff, etc.). Months are counted from the start of the assignment. If some staff are working part-time, it should be indicated so.

Example:

	Name of Staff	Staff input (in the form of a bar chart)						Total
		1	2	3	4	5	6	Total
1	A. M. Saraiva							Part time
2	M. Ruggiero							Part time
3	P. Correa							Part time
4	E.A.Cartolano							6
5	J.Telles							6
6	DB Krobath							6
7	RY Kanaoka							6
8	A. Iuri							Part time

8. **Work Schedule:** Indicate all main activities of the assignment, including delivery of reports and other milestones. Duration of activities shall be indicated in the form of a bar chart.

N°	Activity[1]	Months[2]					
		1	2	3	4	5	6
1	Analysis						
	1st PR and analysis document						
2	Project						
	2nd PR						
3	Implementation						
	Beta version						
	Demonstration events						
4	Testing						
	System completed						
5	Documentation						
	Documents – reports and technical						

7. **Relevant literature cited as footnotes**

(1) FAO, 2008 - https://www.cbd.int/doc/meetings/sbstta/sbstta-13/other/sbstta-13-fao-pollinators-en.pdf

(2) Galai et al. 2009. Guidelines for the economic valuation of pollinator services at a national scale. Food and Agriculture Organization of the United Nations, FAO.

(3) Nicola Gallai, Jean-Michel Salles, Josef Settele, Bernard E. Vaissière:
Economic valuation of the vulnerability of world agriculture confronted with pollinator decline.
Ecological Economics (2008), doi:10.1016/j.ecolecon.2008.06.014.

(4) Food and Agriculture Organization (FAO), 2009. Statistical Database. Available at
http://faostat.fao.org ; Agricultural data/Agricultural production/Crops primary.

G. Summary of Costs

A detailed budget should be presented, calculated in US dollars that shows how IABIN's financial resources for the development of the tools would be spent, and if applicable, how that support fits together with co-financing provided by your or partner institution(s) (please note the description of possible cost-share items, above). Clearly indicate budget items for which IABIN funds would be used.

Information on salaries may include staff name, position, inputs (as provided in staffing schedule above), and rate. Travel may include number of international flights, per-diem, local transportation, miscellaneous expenses, etc. Other expenses must provide description, quantity, unit price, and total.

See attached spreadsheets for IABIN costs and co-financing

Attach a copy of the document(s) stating the legal status of your organization, agency, or institution. If you require further instructions on meeting this requirement, please contact one of the contacts mentioned in paragraph VI above.

Document available at OAS for previous RFP

QUALIFICATION RELATIVE TO CRITERIA TO EVALUATE PROPOSALS
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Administrative Aspects
- The organization's experience and capabilities relevant to the proposed tasks.
    - The organization team has a considerable experience and capability on the development of projects, among which can be cited: the IABIN-PTN; WebBee (www.webbee.org.br) a Brazilian information network of bee diversity; openmodeller (http://openmodeller.sourgeforge.net) a framework for species distribution modelling; ViNCES (http://ib.usp.br/vinces) weblabs on ecosystem services, and CIC – a database of economic data on coffee (http://www.cicbr.org.br/pensa); ITIS ITIS (www.itis.gov) is an authoritative taxonomic information system that includes content on pollinator species.
- Relevant technical experience of the proposed institution's staff in relation to the proposed tasks.
    - The same list of projects and the professional background of the professionals illustrate the experience of the staff.
- General academic qualifications of institution or organization's staff in relation to the proposed tasks
    - Dr. Michael Ruggiero is a Senior Scientific Advisor at the Smithsonian Institution. He is technically involved in several international pollinator activities, including CBD, UN-CSD, GBIF, IABIN-PTN, NAPPC, and BioNET. He has a Ph.D. in insect ecology and is an Adjunct Professor in Natural Resources at Virginia Tech University.
    - Dr. Antonio M Saraiva is a full professor at the Universidade de Sao Paulo, current chair of the section VII (Information system) of the International Association of Agricultural Engineering (CIGR), member of the steering board of the Brazilian Pollinator Initiative, and member of the editorial board of several international and Brazilian journal.
    - Etienne Cartolano received its degree in Master in Engineering at the Universidade de Sao Paulo, with a dissertation on biodiversity informatics.
- Knowledge and capacity to carry out training in IABIN´s official languages. (5 points for each language)
    - The staff has native domain of the English and Portuguese languages, and recently conducted a well evaluated training workshop in English and Spanish within IABIN PTN. A member of the team is fluent in French

language. Both the training and the manuals can be developed in all four languages.

- Proven capacity to collaborate with similar organizations based on the potential to complement each other and leverage additional resources.
    - The organization has proved its capacity to collaborate as it can be evidenced by its participation of a binational consortium (IABIN PTN) overcoming the inherent difficulties (languages, distance, time differences) taking advantage of the complementary expertise and leveraging resources. The same is occurring between the organization and the grantees of IABIN PTN as we have been able to build a network of organizations.

Technical Aspects
- Tool addresses priorities laid out in National Biodiversity Strategies and Action Plans (NBSAPs) for the region
    - The problem of pollinator decline and its sustainable use, as well as the economic importance of the pollination service is recognized by the Convention on Biological Diversity, on the International Pollinator Initiative and by the countries of the Americas. These issues are prioritized in Brazil and in the USA.
- Integration of biodiversity and socio-economic data in resolving key questions and addressing pertinent issues in the Americas.
    - The tool will integrate economic data (crop production and value) with biodiversity data (pollination dependence) to calculate and show in an interactive way the economic value of pollination for a set of important crops (as defined by FAO). It will also allow integration of data from species, protected areas, vegetation and others as available from other IABIN TNs. It will allow analysis on the importance of pollinators by regions, the existence of natural areas and refuges in areas where pollinator dependent crops are grown, the existence of pollinators (data from collections) in such a region, etc.
- Tool will support priority "Areas To Be Addressed By The Proposed Value-Added Tools" detailed in the ToRs for the Third RfP for Component 3
    - It integrates data from biodiversity and socio economic databases. Pollination dependence by crops is a biodiversity data which is not yet addressed by current standards for data exchange (an extended standard for interaction and standards for agricultural crops are being studied now at TDWG, as expressed in its 2009 meeting, held in Montpellier, 9-13/Nov).
- Tools allow users to visualize data and information in an interactive, as well as non-interactive manner
    - It promotes visualization and analysis of data and information. The economic value will be displayed in maps and other graphics to be selected by the user in an interactive way (as well as in table form).
- Utilization of data with models to develop scenarios (options and consequences) for decision makers

- The time series of the agricultural data can be used to develop trends and be linked to the risks of a pollinator decline.
  - The system has the potential to be used to develop scenarios, as the model that calculates the economic value can be adapted to allow changing (potentially decreasing) pollination and its effect on the agricultural production. It might also be adapted to take into consideration future scenarios (e.g. climatic) and their effect on the economic value of pollination. This however will not be incorporated in this first version while it will be exposed to the users for the first time and because it might demand research to validate the methodology.
- Mechanisms proposed to provide users with developed tools through the IABIN Web Portal / Gateway
  - The tool can be made available at the IABIN web portal and/or the IABIN PTN web portal as a link to the USP server where it will be hosted. It might also be replicated if adequate.
- Tools are built with the capacity to be used throughout IABIN's regions (North, Central and South America and Caribbean)
  - The tool will contain data from all the countries covered by the FAO dataset. It will be useful for analysis data of a single American country, of a set of American countries as a means of comparison, or even for comparison with countries outside the Americas.
  - In a future version the tool can be altered to allow input of other data sources, national or local, or even end-user data to allow other levels of granularity of analysis.
  - The tool can be replicated and installed in other institutions.
  - The information used can be verified by the Focal Points as it is based on national data compiled by FAO from the countries. If other data sources (e.g. infra-national level production data) are used more fine-grained analysis can be done.
- Tools are multilingual, or in IABIN official languages (at least English and Spanish, with Portuguese as a plus) 5 points for each language.
  - Tools will be available in English, Spanish, Portuguese and French.
- Tools integrated information from various IABIN's Thematic Networks (5 points for each TN: SSTN, PTN, PATN, ETN, I3N, GeoSpatial) The proposal has to say clearly how IABIN's TN will be integrated
  - The tools has the potential to integrate data from all IABIN TNs if they are able to provide OGC compliant services that can be used to be overlaid with the maps to be generated by the economic model.
  - Although the tool will rely heavily on data sources others than the current IABIN TNS, i.e. FAO, the tool clearly addresses one important gap in current IABIN data and tools as it provides economic data and assessment of biodiversity in the form of pollination services.

		hours	hourly cost	total US$
Development				**63,240.00**
Antonio Saraiva		60	125	7,500.00
Michael Ruggiero		60	125	7,500.00
Pedro Correa		48	65	3,120.00
Etienne Cartolano		480	42	20,160.00
Jorge Telles		480	35	16,800.00
Diogo Krobath		480	10	4,800.00
Rafael Yukio		480	7	3,360.00
Aline Iuri		480	10	4,800.00
Participation in 2 events				**10,000.00**
demonstration events				
Antonio Saraiva				
	ticket	2	1500	3,000.00
	diaries	10	200	2,000.00
Michael Ruggiero				
	ticket	2	1500	3,000.00
	diaries	10	200	2,000.00
grand total				**73,240.00**

	hours	hourly cost	total US$	
personnel			**117,480.00**	
AMS	300	125	37,500.00	
MR	240	125	30,000.00	
PLPC	160	65	10,400.00	
Etienne	480	42	20,160.00	
Jorge	480	35	8,000.00	
Diogo			-	
Edson (tecnician)	60	25	1,500.00	
administration FUSP			8,000.00	
secretary	96	20	1,920.00	
Rafael			-	
Aline			-	
Software			**1,500.00**	
Design			1,500.00	
equipment and facilities			**26,166.67**	
7 computers, 2 servers and software			14,166.67	
				*does not include yet the long term use of the facilities of USP
facilities, network, telephone, etc.			10,000.00	datacenter
consumables			2,000.00	
Total co-financing			**145,146.67**	

1. **Proposed Position**: Investigator

2. **Name of Firm**: University of São Paulo – Polytechnic School

3. **Name of Staff**: Pedro Luiz Pizzigatti Corrêa

4. **Date of Birth**: January 01, 1965   **Nationality**: Brazil

5. **Education**: Doctor (Electrical Engineering), University of Sao Paulo (Poly-USP), 2002; Master in Computer Science, University of Sao Paulo (Institute of Mathematical and Computational Science), 1992; B. Computer Science (Institute of Mathematical and Computational Science -USP), 1987.

6. **Membership of Professional Associations**: Brazilian Association of Agroinformatics (SBIAgro); IEEE (Institute of Electrical and Electronics Engineers) - Computer Society.

7. **Other Training** [*Indicate significant training since degrees under 5 - Education were obtained*]: Distributed Database Discipline (Graduate Studies of Polytechnic School – USP), 96 hours, March-May, 2002.

8. **Countries of Work Experience**: [*List countries where staff has worked in the last ten years*]: Projects and/or meetings with colleagues in Europe.

9. **Languages** [*For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing*]: Native language – Portuguese; English (good reading and speaking, fair writing); Spanish (good reading and oral understanding);

10. **Employment Record** [*Starting with present position, list in reverse order every employment held by staff member since graduation, giving for each employment (see format here below): dates of employment, name of employing organization, positions held.*]:

From: 2003   To: present
Employer: University of Sao Paulo; Polytechnic School
Positions held: Instructor, Assistant Lecturer, Lecturer,
            Since 2002, Investigator of the Agricultural Automation Laboratory;

From: 1997   To: 2002
Employer: UNDP (United Nation Development Programme) - Electronic Government (São Paulo State) – BR/001- Brazil
Positions held: Coordinator of Development System Team

From: 1994   To: 1997
Employer: Accurate Software (Unix Solutions for Electronic Data Interchange)
Positions held: Coordinator of Development System Team

From: <u>1990</u>   To: <u>1993</u>
Employer: Brazilian Agricultural Research Corporation___
Positions held: <u>Software Engineer and Researcher.</u>

11. Detailed Tasks Assigned	12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned
Overall Co-Direction of project (Tasks 1-17)	Name of assignment or project: Modernization Program of São Paulo State Government Year: 1997 -2002 Location: Sao Paulo Client: UNDP (United Nation Development Programme) – Brazil. Main project features: Development of new Information Systems for Treasury Secretary (São Paulo State – Brazil) Positions held: Development system leader Activities performed: project coordination, team recruitment and technical leadership. Name of assignment or project: Bromelia Distributed Database System Year: 2004-2005 Location: Sao Paulo Client: FAPESP - Brazil Main project features: Develop an information system on Bromelia bioversity in Brazil Positions held: project coordinator Activities performed: project coordination, team recruitment and technical leadership Name of assignment or project: ViNCES project – Virtual Network Center on Ecosystem Services Year: 2005-2008 Location: Sao Paulo

Client: FAPESP - Brazil

Main project features: The main objective of the project is to develop weblabs (laboratory experiments and information) for remote access via the advanced Internet. These weblabs focus on two ecosystem services: pollination and photosynthesis, and take advantage of a very high speed network to make available high resolution images and data in real time.

Positions held: investigator.

Activities performed: project coordination, team recruitment and technical leadership.

Name of assignment or project: OpenModeller

Year: 2005-2008

Location: Sao Paulo

Client: FAPESP - Brazil

Main project features: Develop a software infrastructure for species distribution modelling

Positions held: investigator (project coordination: Dr.Vanderlei Canhos, CRIA)

Activities performed: research on architecture and high performance computing.

LUCAS, Persona; CORRÊA, Pedro Luiz Pizzigatti; SARAIVA, Antônio Mauro Algoritmo Genético GARP para modelagem ambiental. São Paulo: EPUSP/USP, Produção Científica da Escola Politécnica da USP. N. 2, 2003, ISSN: 1678-2747.

CORRÊA, Pedro Luiz Pizzigatti; SUZUKI V.H; GUIMARÃES, R.G.; CARVALAHES, Mariana A Service Oriented Information System to Manage Bromelia Distributed Database. In: EFITA/WCCA2005, 25-28 July 2005 Vila Real, Portugal.

CORRÊA, Pedro Luiz Pizzigatti; SARAIVA, Antônio Mauro. Uma arquitetura de sistemas voltada para a integração de bases de dados distribuídas de biodiversidade. São Paulo: SBIAGRO – Revista da Sociedade Brasileira de Informática Aplicada a Agroindústria e Agropecuária. ISSN: 1517-3267.

	6(1). p80 – 102.
	CORRÊA, Pedro Luiz Pizzigatti; PEDROSO, Moacir Jr.; MARTINS, José An Architecture to Application Gateway to Access Government Legacy System, In: eGov INTEROP'05 The First Egovernment Interoperability Conference, 23-25 February 2005 - Genebra, Suiça.
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13. Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly

describes myself, my qualifications, and my experience. I understand that any wilful

misstatement described herein may lead to my disqualification or dismissal, if engaged.

Pedro L P Corrêa

_____ Date: 02/May/2006_____

[Signature of staff member or authorized representative of the staff]   *Day/Month/Year*

Full name of authorized representative: Pedro Luiz Pizzigatti Corrêa

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EDUCATION AND TRAINING

- Ph.D., Zoology, George Washington University, Washington, DC, 1982
- M.S., Zoology, George Washington University, Washington, DC, 1977
- B.S., Biology, Mount Saint Mary's University, Emmitsburg, MD, 1972
- Washington Executive Leadership Seminar, Office of Personnel Management, Office of Executive Development, Washington, DC, 1991

PROFESSIONAL EXPERIENCE

- **Smithsonian Institution**, Washington, DC, Senior Science Advisor (PT), 2007-Currrent.
  - Provides high-level representation for ITIS to governmental and non-governmental organizations in international bioinformatics activities.
  - Serves as senior advisor to ITIS in support of its efforts as part of NMNH informatics.
- **Expert Solutions International, LLC**, Reston, VA, President, 2007-Current.
  - Directs and provides expert consulting and professional services to government and private organizations on all aspects of natural resource issues, especially those related to biodiversity conservation and bioinformatics.
  - Works nationally and internationally to conduct scientific assessments and reports, organize and lead expert and planning workshops, and perform technical analysis and evaluation.
- **U.S. Geological Survey**, Washington, DC, Director, Integrated Taxonomic Information System, 1999-2007.
  - Directed public-private partnership organization to develop and operate an automated and authoritative index for scientific names of living organisms. Led national and international efforts to standardize biological nomenclature at national, regional, and global scales.
  - Represented the U.S. Government, DOI, and USGS in international forums for biodiversity and bioinformatics, including the Global Biodiversity Information Facility (GBIF), the Convention on Biological Diversity (CBD), and the Catalogue of Life.
- **U.S. Department of the Interior, Office of the Secretary**, Washington, DC, International Biodiversity Coordinator, 1998-1999.
  - Represented the U. S. Government, the Department of the Interior, and the USGS in major national and international biological diversity initiatives and policy discussions.
  - Provided technical advice to the State Department, White House, and National Science and Technology Council (NSTC) on biological diversity issues.
- **Executive Office of the President, Office of Science and Technology Policy**, Washington, DC, Agency Representative (Senior Science Policy Advisor), 1996.
  - Served as USGS representative to White House Science Office, providing expertise on biodiversity and environmental monitoring issues.
  - Produced major NSTC report on integrating the nation's environmental monitoring networks.

- **U.S. Geological Survey and National Biological Service**, Reston, VA, Leader, National Biological Status and Trends Program, 1993-1998.
  - ‣ Directed activities at the national, regional, and local levels to establish an integrated inventory and monitoring program.
  - ‣ Coordinated the collection, synthesis, and reporting of national, regional, and local data to support national inventory and monitoring programs for ecosystems in national parks, refuges, and resource areas of the Department of the Interior, as well as on private areas of collaborating entities.
- **National Park Service**, Washington, DC, Chief, Wildlife and Vegetation Division, 1988-1993.
  - ‣ Managed a Division of more than 30 employees that formulated, planned, and coordinated policies on wildlife, vegetation, and natural resource programs of broad Service-wide importance. Managed Service-wide programs related to endangered species, exotic species, integrated pest management, international Man and Biosphere (MAB), biological diversity, global climate change, national acid deposition and assessment, natural resources preservation funding, and National Natural Landmarks.
  - ‣ Directed the assessment of the condition of natural resources of national parks, managed wildlife and vegetation research of system-wide applicability, and developed ecosystem management strategies.
- **National Park Service**, Omaha, NE, Regional Chief Scientist, 1985-1988.
- **National Park Service**, Washington, DC, Integrated Pest Management Coordinator, 1982-1985.
- **Environmental Protection Agency, Office of Water**, Washington, DC, Biologist, 1981-1982.
- **National Park Service**, Washington, DC, Integrated Pest Management Coordinator, 1980-1981.
- **George Washington University**, Washington, DC, Lecturer, 1980.
- **Environmental Protection Agency, Office of Toxic Substances**, Washington, DC, Biologist, 1977-1980.
- **George Washington University**, Washington, DC, Graduate Teaching Fellow, 1975-1979.
- **U.S. Army, Walter Reed Army Institute of Research**, Washington, DC, Biological Science Assistant, 1972-1974.

CONTRACTS AND GRANTS

- Global Biodiversity Information Facility (Denmark), Contract: 2007.
- Coevolution Institute (US), Contract: 2007.
- Inter-American Biodiversity Information Network (IABIN)-World Bank, Co-PI, Grant: 2006-2008.
- Global Biodiversity Information Facility (Denmark), Co-PI, Grant: 2004-2006.
- Biotechnology and Biological Sciences Research Council (UK), Co-PI, Grant: 2001.
- Civilian Research and Development Foundation (US), Co-PI, Grant: 1996-98.
- The German Marshall Fund of the United States, Environmental Fellowship: 1989.

HONORS AND AWARDS

- Group Honor Award for Meritorious Service, U.S. Department of State, 2004.
- Hammer Award, 1998.
- Honor Award for Meritorious Service, U.S. Department of the Interior, 1991.
- Isabella Osborn King Research Fellowship, George Washington University, 1979-80.

SCIENTIFIC COMMITTEES AND MEMBERSHIPS

- Coordinator, Global Pollinator Species Campaign, GBIF, 2007.
- Research Associate, Smithsonian Institution, National Museum of Natural History, 2004-2007.
- Steering Committee Member, North American Pollinator Protection Campaign, 2000-present.
- Governing Board Member, Global Biodiversity Information Facility, 2000-present.
- Co-Chair, Species 2000 and ITIS Catalogue of Life Steering Committee. 2004-2007.
- U.S. Delegate to Subsidiary Body for Scientific, Technological, and Technical Advice, United Nations Convention on Biological Diversity, 1995-2006.
- U.S. Delegate to United Nations Convention on Biological Diversity Conference of Parties, 1996-2006.
- National Committee, U.S. Man and Biosphere Program, 1996-2006.
- Co-Chair, NBII Science Committee, 2002-2004.
- Chair, Global Biodiversity Information Facility Science Subcommittee for the Electronic Catalog of Names, 2001-2004.
- Co-Chair, Global Invasive Species Program, Information Management Working Group, 2001-2004.
- Executive Secretary, National Science and Technology Council, Committee on Environment and Natural Resources, Subcommittee on Ecological Systems, 1997-2000.
- Forest Research Advisory Committee, U.S. Department of Agriculture, 1994-1999.
- Co-Chair, National Science and Technology Council, Committee on Environment and Natural Resources, Environmental Monitoring Team, 1995-96.
- Committee on National Parks and Protected Areas, International Union for the Conservation of Nature, 1994-1996.
- Directorate on Biosphere Reserves, U.S. Man and Biosphere Program, 1994-96.
- Co-Chair, National Science and Technology Council, Committee on Environment and Natural Resources, Ecosystems Working Group, 1994-95.
- Subcommittee on Society Organization, Ecological Society of America, 1994.
- Chair, Metropolitan Washington Chapter, Ecological Society of America, 1993-94.
- National Biological Survey Implementation Team, U.S. Department of the Interior, 1993.
- Subcommittee on Recruiting and Retaining Women and Minorities in Ecology, Ecological Society of America, 1993.
- Chair Elect, Metropolitan Washington Chapter, Ecological Society of America, 1992-93.
- U.S. Delegation to EUROMAB Congresses II, III, and IV, United Nations Environmental, Scientific, and Cultural Organization, 1989, 1991, and 1993.

RECENT PRESENTATIONS

- A Pollinators Thematic Network for the Americas, Biodiversity Information Standards (TDWG) Annual Conference 2007, Bratislava, Slovakia, September 2007.
- Taxonomic Standards for Sharing Information: A Case Study for Pollinators, EcoSummit 2007, Beijing, China, May 2007.
- The IABIN Pollinators Thematic Network, 5th Council Meeting of IABIN, Punta del Este, Uruguay, May 2007.
- GBIF Pollinators Proto-Campaign, Pollinator Information in the Americas Workshop, Indaiatuba, Brazil, December 2006.
- International Initiatives for Pollinators, Pollinator Partnership Symposium: Protecting Plant Pollinator Interactions World Wide, Washington, DC, October 2006.
- GBIF Pollinators Proto-Campaign, GBIF GB13, Iquitos, Peru, October 2006.

- The Integrated Taxonomic Information System (ITIS), Joint International Workshop on Biodiversity Informatics: An INDO-US Initiative, Pune, India, December 2005.
- Integrated Taxonomic Information System, Species 2000 Europa Meeting, Qawra, Malta, March 2005.
- ITIS and the NBII, NBII All Nodes Meeting, Big Sky, Montana, June 2004.
- The Five W's of ITIS, AABGA Annual Conference, Dallas, Texas, June 2004.
- Integrated Taxonomic Information System, Species 2000 – ITIS Catalogue of Life Seminar and Discussion, Smithsonian Institution National Museum of Natural History, Washington, DC, May 2004.
- Bioinformatics and Invertebrate Monitoring, Expanding the Ark Symposium, American Museum of Natural History, New York, New York, March 2004.
- Species 2000 & ITIS Catalogue of Life: Indexing the World's Known Species, International Congress of Zoology, Beijing, China, August 2004.
- Integrated Taxonomic Information System, Interagency Infectious Disease Informatics Working Committee, Washington, DC, October 2003.
- Integrated Taxonomic Information System, Sao Paulo Plus Five: Pollinators and Information Technology, Sao Paulo, Brazil, October 2003.
- Global Efforts to Conserve Pollinators, USDA Sustainable Development Seminar, Washington, DC, June 2003.

SELECTED PUBLICATIONS

- Chavan, V., Rane, N., Watve, A., Ruggiero, M. 2005.   Resolving taxonomic discrepancies: Role of Electronic Catalogues of Known Organisms. Biodiversity Informatics [Online] :8.
- Bisby, F.A., M.A. Ruggiero, K.L. Wilson, M. Cachuelo-Palacio, S.W. Kimani, Y.R. Roskov, A. Soulier-Perkins, and J. van Hertum (eds). 2005. Species 2000 and ITIS Catalogue of Life: Annual Checklist 2005. CD-ROM; Species 2000: Reading, U.K.
- Bisby, F.A., Froese, R, Ruggiero, M. A. and Wilson, K.L., (eds). 2004 -2007. Species 2000 and ITIS Catalogue of Life, Annual Checklist 2004: Indexing the world's known species. CD ROM, Species 2000: Los Banos, Phillipines.
- Ruggiero, M., Buchmann, S., and L. Adams. 2004. The North American Pollinator Initiative. In: Solitary Bees: Conservation, Rearing, and Management for Pollination, B. Freitas and J. Pereira, eds. Fortaleza: Imprensa Universitatia, 2004. pp. 35-41.
- Meese, R., V. Neronov, G. Alestchenko, and M. Ruggiero. 2003. Rapid acquisition and dissemination of standardized biological inventories from Russian biosphere reserves. Biodiversity and Conservation 12: 1421-29.
- Bisby, F., J. Shimura, M. Ruggiero, J. Edwards, C. Haueser. 2002. Taxonomy, at the click of a mouse. Nature 418: 367.
- Baillargeon, G. and M. Ruggiero. 2000. The Integrated Taxonomic Information System. ASC Newsletter 28(5): 11.
- Ruggiero, M.A. 1999. Wild life is more than wildlife: policy for other animals in the national parks. The George Wright Society Bulletin.
- Bricker, O. and M.A. Ruggiero. 1998. Toward a national program for monitoring environmental resources. Ecological Applications 8(2):326-9.
- Ruggiero, M.A., J. Barnard, O. Bricker, S. Collins, B. Hicks, M. Huston, A. Janetos, T. Lillestolen, P. Murdoch, A. Robertson, D. Scavia, G. Schaefer, D. Shaw, D. Shriner, T. Strickland, J. Vickery, and M. Weltz. 1997. Integrating the nation's environmental monitoring and research networks and programs: a proposed framework. National Science and Technology Council, Committee on Environment and Natural Resources, Washington, D.C. 82 pp.
- Dennis, J.G. and M.A. Ruggiero. 1996. Biodiversity inventory: building an inventory at

scales from local to global. In: Biodiversity in managed landscapes: theory and practice, R. Szaro and D. Johnston (eds.). Oxford University Press, New York. pp.149-56.

- Scavia, D., M. Ruggiero, and E. Hawes. 1996. Building a scientific basis for ensuring the vitality and productivity of U.S. ecosystems. Bulletin of the Ecological Society of America 77(2):125-27.
- Stohlgren, T., J. Quinn, and M. Ruggiero, and G. Waggoner. 1995. Status of biotic inventories in U.S. national parks. Biological Conservation 71:97-106.
- Ruggiero, M., T. Stohlgren, and G. Waggoner. 1992. Towards a biological survey of the U.S. national park system. In: Developments in Landscape Management and Urban Planning, 7, Science and the Management of Protected Areas, J.H.M. Willison, et al. (eds.). Elsevier, Amsterdam. pp. 31 35.
- Dennis, J.G. and M.A. Ruggiero. 1990. Conserving biological diversity. In: Preserving Natural Resources, M.A. Ruggiero (ed.). Trends 27(4):4 7.
- Ruggiero, M.A. (ed.). 1990. Preserving natural resources. Trends 27(4): 48 pp.
- Ruggiero, M.A. 1986. Rational use of pesticides in park and recreation areas. Trends 23(1):10 14.
- Ruggiero, M.A. and H.C. Merchant. 1986. An estimated energy budget for a population of eastern tent caterpillars (Lepidoptera: Lasiocampidae) in Maryland. Environmental Entomology 15(4):795 99.
- Ruggiero, M.A. and M.P. Wang. 1985. National toxic criteria to protect aquatic life: their development, modification, and use. In: Hazard Assessment of Chemicals Current Developments. Volume 4, Academic Press, Orlando, FL. pp 149 77.
- Ruggiero, M.A. and G. Johnston. 1984. Pest management the IPM approach. Park Science 4(2):22.
- Ruggiero, M.A. 1981. Marine genetic toxicity and water quality criteria. Proceedings of Symposium on Marine Genetic Toxicology, Narragansett, RI.
- Ruggiero, M.A. and H.C. Merchant. 1979. Water quality, substrate, and macroinvertebrate distribution in the Patuxent River, Maryland. Hydrobiologia 64(2):183 89.