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Proposal for the Development of a Web-based Biodiversity Data Viewer and Screening Tool

November 13, 2009

Department of Sustainable Development
 Organization of American States
 1889 F St. NW, Suite 773-C
 Washington, DC 20006
 Attn: Luisa Fernanda Neira

Dear Ms. Neira:

Applied Science Associates, Inc. (ASA) South America (São Paulo, Brazil) and United States (South Kingstown, Rhode Island) is pleased to submit our response to the Third RFP for the Development of Value-Added Tools for Decision-Making.

ASA is currently classified as a Small Business. We incorporated in 1979 and are considered a separate entity. Applied Science Associates, Inc. has a current active filing of representations and certifications in accordance with FAR 4.12 at <http://orca.bpn.gov>. Our DUNS number is 09 597 0938 and our TIN is 05-0381942. Business registration documentation for ASA South America is attached within.

Points of Contact for this proposal effort are:

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We sincerely hope that this proposal effort is a successful one and we look forward to the successful completion of the work.

Best Regards,


 Eduardo Yassuda



Linda Nolan Gagne

Project Summary:

To support the *Inter-American Biodiversity Information Network (IABIN)* ASA proposes leveraging its existing visual GIS based model and data distribution systems to develop a biodiversity site-screening tool with the goal of helping scientists, managers and planners compare the biodiversity of different regions in order to minimize biodiversity loss when planning conservation areas or development projects. Although this system can be applied to any geographic region, the value of the tool depends on the quality and organization of the data. To keep the results tangible within the scope of this proposal, we propose a demonstration region of Parana state, Brazil. ASA has experience working in this state and can leverage its understanding of biodiversity issues for the development of this tool.

The objective of the web based GIS portal and biodiversity screening tool is to (1) connect to existing biodiversity databases and potentially other socio-economic datasets; (2) display the information geographically and dynamically over time, and (3) compare the biodiversity and socio-economic data for different user-specified regions and time periods in order to inform managers, researchers and scientists about decisions that can minimize impacts to biodiversity.

Para dar suporte a *Inter-American Biodiversity Information Network (IABIN)* a ASA propõe alavancar seu atual modelo baseado em SIG visual e sistemas de distribuição de dados para desenvolver uma ferramenta de visualização on-line com o objetivo de ajudar os cientistas, gestores e planejadores a comparar a biodiversidade de diferentes regiões com o intuito de minimizar a perda de desta no planejamento de áreas de conservação ou projetos de desenvolvimento. Embora este sistema possa ser aplicado a qualquer região geográfica, o valor da ferramenta depende da qualidade e organização dos dados. Para manter os resultados tangíveis no âmbito desta proposta, nós propomos a demonstração para uma região no Estado do Paraná, Brasil. A ASA possui experiência adquirida em diversos projetos realizados neste estado e pode contribuir com o entendimento das questões relacionadas à biodiversidade para o desenvolvimento desta ferramenta.

O objetivo desta ferramenta de visualização on-line da biodiversidade é, (1) conectar as bases de dados de biodiversidade existentes e a potenciais conjuntos de dados socioeconômicos, (2) apresentar a informação de forma geográfica e dinâmica ao longo do tempo e (3) comparar a biodiversidade e dados socioeconômicos de regiões e épocas especificadas por diferentes usuários, a fim de auxiliar os gestores, pesquisadores e cientistas nas decisões que possam minimizar os impactos à biodiversidade.

Para apoyar a la Red *Inter Americana de Información sobre Biodiversidad (IABIN)*, ASA propone acoplar su modelo visual en GIS y sus sistemas de distribución de datos con el fin de desarrollar un caso piloto por medio de una herramienta que se adapte a las necesidades de los tomadores de decisiones y que presente la biodiversidad del lugar, facilitando la comparación entre diferentes regiones, siendo el objetivo final minimizar las pérdidas de biodiversidad en la gestión de áreas de conservación o propuestas de proyectos de desarrollo. Aunque este sistema puede ser aplicado a cualquier región geográfica, el valor de la herramienta depende de la calidad, organización y diseminación de los datos. Para conseguir resultados tangibles con los objetivos de la propuesta proponemos una demostración en una región del estado de Paraná, en Brasil. ASA tiene experiencia trabajando en este estado y puede aportar su conocimiento en relación con el desarrollo de esta herramienta y su relación con la biodiversidad de ésta región.

Los objetivos de un portal en GIS concretados en este caso de estudio son: (1) conectar las bases de datos de biodiversidad existentes y otras bases potenciales de datos socio-económicas, (2) representar la información geográficamente y dinámicamente con la evolución en el tiempo y (3) comparar la biodiversidad y los datos socio-económicos para diferentes usuarios en regiones específicas del estado de Paraná y su evolución con el tiempo, con el objetivo final de informar apropiadamente a tomadores de decisiones, investigadores y científicos sobre las decisiones que puedan minimizar los impactos en la biodiversidad del estado de Paraná.

Project Description

1. Rationale

Biodiversity, or the number of genes, species, and ecosystems within a region, is a global resource yet its status is largely impacted by variables that occur at much smaller scales. Though recent international legislation has been developed to protect endangered species globally, most preservation and conservation occurs at the country level, or smaller. This has long been a point of contention as political and natural boundaries rarely align. Thus, in order for sustainable development to occur, decision-making tools that evaluate both environmental and social information need to be developed and utilized¹. The Inter-American Biodiversity Information Network (IABIN) is working to generate collaboration across the Americas with respect to collection, management, and use of biodiversity data with an emphasis on helping decision-makers incorporate this vital information as new decisions are made.

The Center for Applied Biodiversity Science at Conservation International has identified 34 hotspots of biodiversity, or those areas that have the richest resources of plant and animal life on earth². Nine of these hotspots occur within the Americas. The Atlantic Forest, which extends over much of the east coast of Brazil and consists of both a coastal and inland habitat, has shrunk from close to 1.25 million square kilometers to less than 100,000 square kilometers². The Brazilian state of Paraná, which stretches from the coast inland to the borders of Argentina and Paraguay, is covered by this forest and another unique ecosystem, the araucaria forest. Because of this, ASA has decided to focus the efforts for developing this tool on Paraná. Much research has been done on the biological, ecological, and socio-economical status of this state, which continues to grow and use the natural resources provided by the state. Additionally, expansion of the product to all of Brazil, its bordering countries, and finally throughout the Americas is well poised from Paraná, which has two international boundaries.

In order to succeed in managing the environment, it is necessary to also consider human factors. There are many factors that drive change in ecosystems, and these drivers can be direct or indirect. Direct drivers include changes in the physical, biological and chemical compositions of the environment whereas indirect drivers are generally linked to human use and consumption of resources³. Every ecosystem has many decision-makers which exert influence over different parts of the system (i.e. farmers, fishers, households, industry)⁴. Similarly, every decision-maker can influence and be influenced by several factors of environmental change at the same time.

In order to make informed decisions concerning biodiversity, planners and managers need to spatially view biodiversity information, combine it with other data sets, and analyze its value. A major challenge of this process is the resolution of each dataset. In order for decisions based on both environmental and socio-economic data to be successful, the information needs to be trustworthy and in scale with the environmental systems and political jurisdictions associated with the problem⁵. For instance, aggregated data might overlook or average out important information used for making local decisions, while highly resolved data may impede decisions made on larger scales.

¹ McNeely, J.A., D.P. Faith, and H.J. Albers. 2005. Millennium Ecosystem Assessment Volume 3: Ecosystems and Human Well-Being: policy responses. Chapter 5: Biodiversity, pp 119-72. Island Press, Washington, D.C.

² Conservation International, Center for Applied Biodiversity Science. 2007.

<<http://www.biodiversityhotspots.org/xp/hotspots/Pages/default.aspx>> Accessed 12 Nov 2009.

³ Nelson N.C. 2005. Millennium Ecosystem Assessment Volume 1: Ecosystems and Human Well-Being: Current State and Trends. Chapter 3: Drivers of Ecosystem Change, pp 73-76. Island Press, Washington DC.

⁴ Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-Being: a framework for assessment. Chapter 4: 85-93. Island Press, Washington, D.C.

⁵ Dietz, T., E. Ostrom, and P.C. Stern. 2003. The struggle to govern the commons. *Science* 302: 1907-1912.

Presently, there is a large body of work to build on including decision support tools developed for Marine Protected Areas, such as Marine Map (www.marinemap.org) and viewers to assess global data sets, such as SERVIR (www.servir.net). However, these existing decision support tools are not directly developed for biodiversity. In addition, existing viewers do not have the capability to edit and interrogate data. There are also valuable methodologies for calculating various indices related to environmental sensitivity, vulnerability and biodiversity. However, indices aggregate and summarize data that could be important for local decisions.

Therefore, ASA proposes to develop a tool that will allow decision makers to visually discover biodiversity data along side socio-economic data sets for their areas of interest, time of interest and subject matter of interest, and perform analysis to support decision making.

2. Project Goals and Objectives

To support the IABIN, ASA proposes to leverage its existing GIS-based model systems and decision support tools to develop a biodiversity site-screening tool with the goal of helping scientists, managers and planners compare the biodiversity of different regions to minimize biodiversity loss when planning conservation areas or development projects. Although this system can be applied to any geographic region, the value of the tool depends on the quality and organization of regional data. To keep the results tangible within the scope of this proposal, we propose a demonstration region of Paraná state, Brazil. ASA has experience working in this state and can leverage its understanding of biodiversity issues for the development of this tool.

The objective of the web-based GIS application and biodiversity site-screening tool is to (1) connect and interact with existing biodiversity databases and other socio-economic datasets; (2) display the information geographically and dynamically over time, and (3) compare the biodiversity and socio-economic data for different user specified regions and times in order to inform managers, researchers and scientists about what decisions can minimize impacts to biodiversity.

The specific goals of the proposed solution are:

- (1)** To develop a demonstration scale product that incorporates the many datasets necessary to make decisions regarding biodiversity in space and time with the intention of expanding beyond the demonstration area. The IABIN has been working to generate large scale databases across countries and continents under a standardized input scheme. Utilizing parts of these standardized datasets means that the full data can be easily integrated into the newly developed tool as the scale of the project expands, and as the datasets themselves are updated by member countries and users. This versatility will allow users to adapt this tool to future data sets, geographical regions, longer time-series, and unforeseen decision-making issues. This demonstration scale product will also highlight other data needs for which the IABIN may want to develop entry/management standards.
- (2)** To provide easy access to biodiversity information dynamically through space and time so that decision makers can include biodiversity considerations in their decision making process. ASA's goal is to use a web portal as a centralized location where biodiversity data can be spatially viewed throughout time alongside other geospatial datasets, such as those containing socio-economic data. This would provide open access for all managers, planners and scientists. This web portal will be designed so that the user can interrogate and zoom to information of their interest. In addition, data with time components will be visualized through the use of a time slider play bar. An example of this is shown in Figure 1.

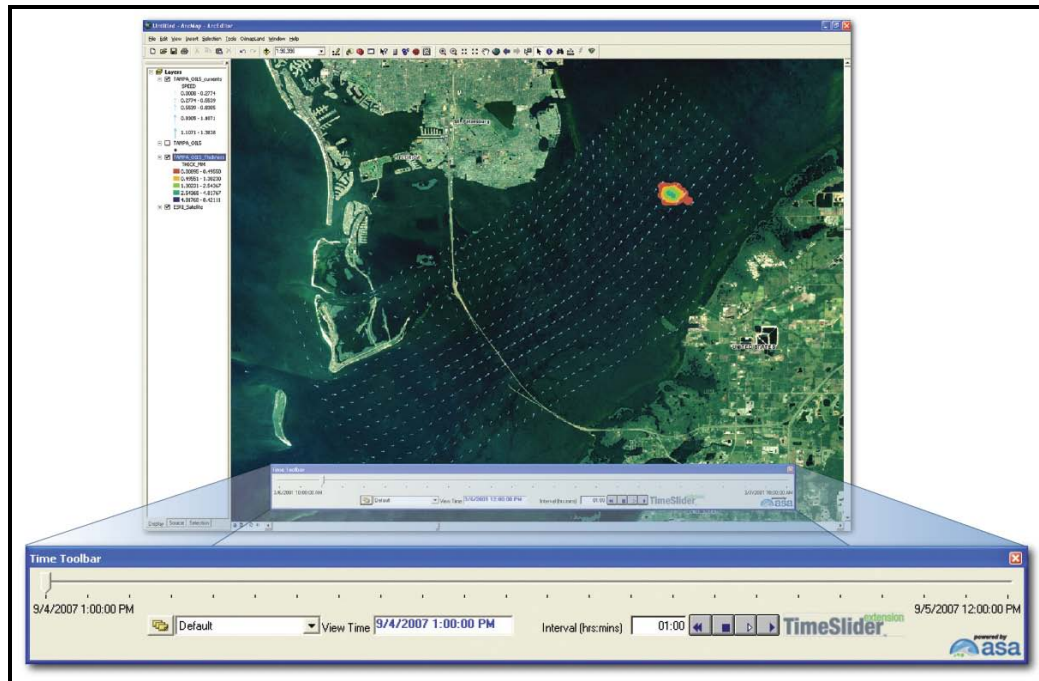


Figure 1: Time slider Playbar

(3) The third goal is to provide decision makers and other users with a simple screening tool to assess and compare biodiversity alongside socio-economic data for their user defined regions and time. Example uses of the tool are:

- A planner has to make a decision about the effectiveness of a protected area and he/she uses the tool to return the biodiversity data sets from the protected region for various times throughout its existence.
- A developer wants to build, while minimizing impacts to biodiversity so he/she traces the potential development regions and compares the biodiversity data for each region.
- A scientist wants to examine the biodiversity of regions with higher and lower population densities, so he/she traces a series of regions, some with high population densities and some with lower population densities, and can then see if there is a correlation by comparing the reports for the series of regions.

By utilizing the web portal graphical interface, any one user can identify their specific regions of interests and datasets of interest. Then the screening tool will return a report on the biodiversity and socio-economic data for the specified regions. This tool allows a quick screening assessment of biodiversity trends and patterns; however, it does not eliminate the need for more in-depth studies. This tool also allows the user to compare two different regions, thus aiding in decision making. If a state planner was trying to decide where to implement more protected areas, they could look at various protected areas and examine their biodiversity through this tool to quickly identify which ones are of most value to expand. By allowing the user to specify its geographic region of interest, data discovery remains on a scale that is specific to his/her local, regional, national or international needs.

3. Project Activities and Methodologies

The project will be executed through the following six technical tasks which are outlined in the work plan: (1) Evaluation of Concept by Stakeholder and Intended Tool Users; (2) Biodiversity Data Research, Acquisition, and Management (specific to demonstration area); (3) Connection of Data to Web-based

Visualization System; (4) Adaption of Screening Tool to Biodiversity Data; (5) Manual and User Guide Construction, and (6) Reporting.

1. Evaluation of Concept by Stakeholders and Intended Tool Users

The successful development of a decision-making tool is hinged upon the usefulness provided to its targeted users. Therefore, ASA will work with IABIN to identify appropriate users in Paraná, and then perform interviews to solicit input on the most useful information needed. Input will be solicited prior to the development of the Biodiversity Site Screening Tool in order to ensure that both the data going into the tool and the analyzed information output are of use to those individuals making the decisions. ASA will then return to the same users with the beta version of the web-based tool, due to IABIN on 15 April 2010; therefore allowing them to explore the tool, and collect suggestions on how to improve the tool and its presentation of information.

2. Biodiversity Data Research, Acquisition, and Management (specific to demonstration area)

The Biodiversity Screening Tool proposed here will incorporate data from Paraná, Brazil. However, many of the datasets identified by the IABIN cover a larger extent, many encompassing all of the Americas. The highlighted data to be incorporated include the Species and Specimens (SSTN), the Pollinators (PTN), the Protected Areas (PATN), and the Invasives Information (I3N) thematic networks and other geospatial data. Thus, at the completion of this scope of work, the software products will be set up to incorporate larger scale datasets. Additional data will be compiled to assess the many indirect drivers that impact biodiversity. Examples include land use change, habitat fragmentation, population density, gross domestic product, and other social indicator data sets. These datasets may not be available in uniform formats across countries, and therefore the expansion from the demonstration area to a larger scale may require additional work to incorporate these data at that scale.

The PATN is based on the 2006 version of the World Database on Protected Areas (WDPA). This database also released an ESRI ArcGIS version in early 2009. This database, old, new or both, can be connected directly to this tool and displayed. As new versions are released, they can be downloaded and replaced on the server to incorporate the most recent information. The database includes a field for the year each protected area was designated. Utilizing this field will allow the tool to display the addition of protected areas from year to year. However, this does not include changes within individual protected areas. Since this project would be investigating the state of Paraná it may be preferable to locate data regarding individual protected areas of the state and incorporate the evolution of their boundaries, as they may have expanded or contracted over time.

The PTN hosted by IABIN is a compilation of over 80 datasets from 7 sources. Brazil has a large dataset, much of which has been georeferenced, that can be downloaded by the user at any time. However, these data are very anecdotal in nature and have been collected as inconsistent intervals. This suggests that a broader data set may be more useful, such as the Integrated Taxonomic Information System (ITIS) or Species2000, in which checklists of species known to occur have been developed for countries and regions.

The I3N is an online Microsoft Access database maintained by the NBII of the USGS. This database is constantly growing as users from member countries, including Brazil, can add records at any time. Included in the fields of this dataset are place and date of introduction, which refer to the original introduction of the species. Additionally, a separate folder holds all the occurrences of the species, which lists location (latitude/longitude and descriptive distinctions) and dates observed. This level of detail will allow the tool to display invasive species in both space and time. This will help users visualize the spread of individual invasive species.

The ETN also has a standard entry format that includes options for data entry via web map service (WMS) or latitude/longitude, both of which produce geospatially explicit information. This database also contains entry fields for country and region which will allow for selection at the appropriate scales.

3. Connection of Data to Web-based Visualization System

ASA uses a wide variety of open source and commercial software to build solutions for clients all over the world. The tools use different technology but are common in that they incorporate complex geospatial data management, analysis of time-varying data, integration of earth and environmental science data with GIS, and implementation of complex science tools embedded in sophisticated, but simple to use, user interfaces. As an example, ASA recently delivered Minnesota Map Server (OpenSource), a web-based tool using Adobe Flex, which connected via web services to oil and chemical spill models to support water quality in the Yangtze River, Wuhan, China.

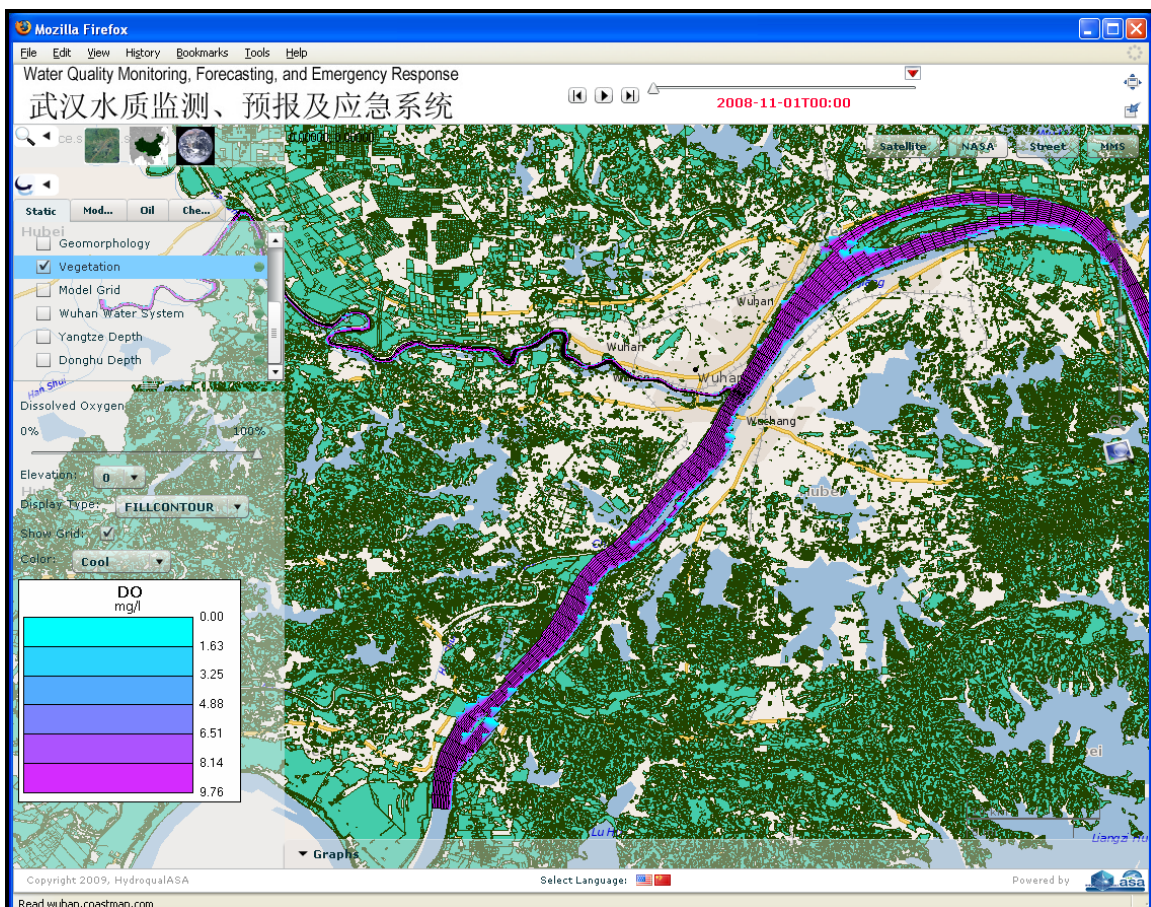


Figure 2: Example of Web-based Tool, Yangtze River, Wuhan, China

ASA also implements solutions with commercial technology. ASA has been an ESRI business partner for over 10 years and has built custom ArcGIS extensions for clients such as NOAA, U.S. Coast Guard, and the U.S. Navy. These extensions include functionality, such as integrating disparate bathymetric data sets, managing time varying data, integrating satellite and model data from science and fisheries users, and integrating disparate GIS and science literature for marine spatial planning purposes. The extensions are generally built with .NET and appear as seamless objects (i.e. buttons, menus) within the ArcMap framework.

Currently, ASA is building the Abu Dhabi Coastal Atlas for the Environment Agency of Abu Dhabi (EAD). This project combines highly sophisticated desktop tools for scientists and planners, and also web-based access for the public. The system includes habitat classification and tools to analyze impacts from stressors such as sea level rise, nutrient loading, and oil spill pollution. The functionality of the Atlas includes:

- Access to geospatial and bibliography data;
- Ability to interrogate ecological and other geospatial data represented on the map;
- Search on data based on attributes and geographic extents;
- Search the bibliography data through the map interface, or through a more traditional table-based database query;
- Search the metadata catalog;
- Link directly to documents that may be within the database, on the server, or on distributed servers and identified by URLs, and
- Generate custom reports

To accomplish this task, ASA will combine our ability to integrate disparate data offered by different providers and map services into a unified web-based application for data viewing and analysis. We will leverage existing efforts and technologies to be able to provide a unique service that meets the needs of decision-makers throughout the Americas.

4. Adaptation of Screening Tool to Biodiversity Data

The biodiversity tool will allow the user to assess the biodiversity of a region along side socio-economic data. A simple prototype is shown below, in which a polygon region representing the areas of concern may be selected by the user. The tool then accesses the underlying GIS data using web services and summarizes the biodiversity assets and socio-economic information. These data could be presented in a variety of ways, including reports and tables containing information such as the number of species, status of critical species, area of protected regions, and population density. The tool also allows the user to compare impacts from multiple regions.

Presently, ASA has developed a generic site screening tool. We will leverage this existing framework and adapt it to specifically meet the needs of biodiversity analysis by reporting information in values most useful to decision makers. These values will be confirmed in the evaluation phase.

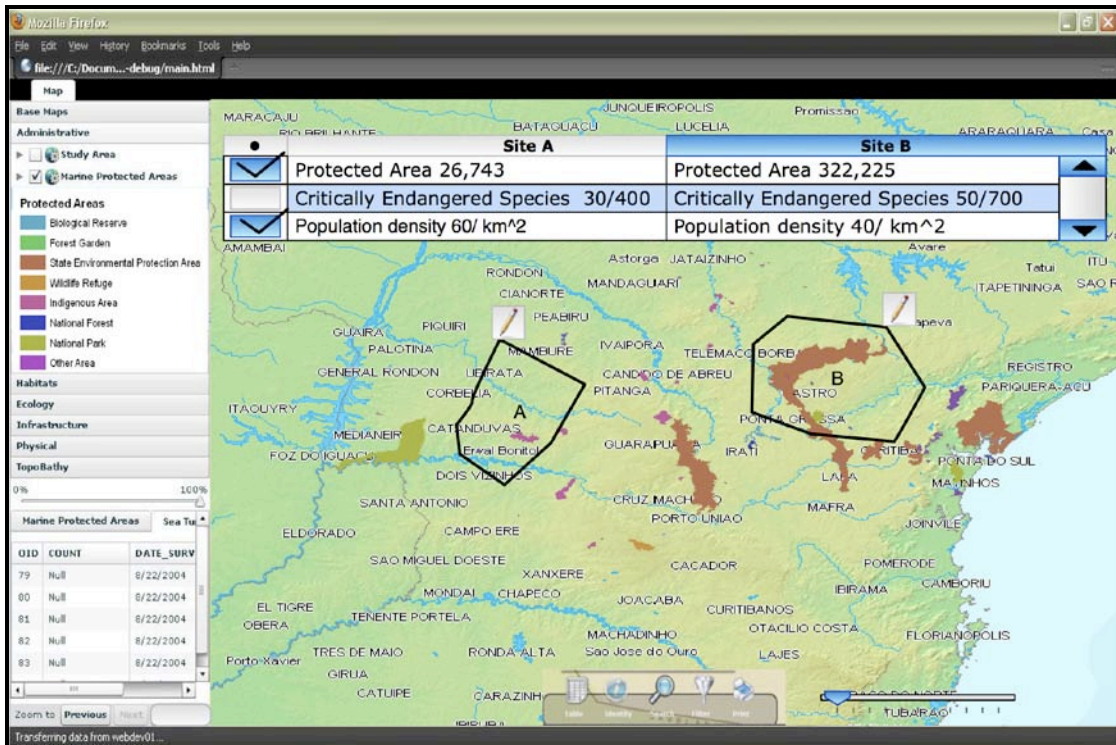


Figure 3: Prototype of Biodiversity Screening Tool, Paraná, Brazil

The tools will produce a document summarizing the data displayed in the interface. These data will tabulate information selected by the user that describes both the direct and indirect variables associated with the biodiversity of the query area. The output summary document will include information from the datasets that cannot be displayed spatially.

An example output report could include:

- Biological:
 - SSTN:
 - Number of species
 - Status of critical species (Red List, CITES, T&E)
 - I3N:
 - Number of invasive alien species
 - Degrees of invasive potential for each species
 - PTN:
 - Number/Types of pollinators
 - Status of pollinators (Red List, CITES, T&E, diseases)
- Ecological:
 - PATN:
 - Number/Types of protected areas
 - Area (km²) or Percentage of land protected
 - ETN:
 - Number/Types of ecosystems
 - Status of habitats, if critical/fractured
- Socio-Economic:
 - Population density
 - Population percentage below poverty

5. Manual and User Guide Construction

ASA proposes to develop a manual and user guide in two languages (English & Portuguese). The manual will include information on the process of development, the framework, technical details, metadata descriptions and example use cases.

The user guide will include a Quick Start Guide which will guide the user through the following;

- Starting the application
- Navigating the Globe
 - Layer navigation
- Layer management
 - Turning on/off layers
 - Adding new data layers
 - Editing data layers
- Using the Biodiversity Screening Tool
- Reading output reports
 - Exporting

6. Reporting (Interim and Final)

ASA follows a system of work activity monitoring and assessment integrated with its project team communication plan. Two interim progress reports from managers will provide hours expended on each task and status updates reported to the IABIN management team. Combined with the weekly project team conference calls, tracking the hours expended on each task will allow for a consistent monitoring of project activity. The final report will include discussions of evaluations from stakeholders, methodologies, rationale and descriptions of biodiversity in the region and the integrated data.

4. Time Frame / Work Plan

All work will be conducted from January to June 2010.

Tasks, work schedule, and ASA staff:

Technical Tasks	Approximate Work Schedule (2010)	Supervising Staff	Technical Staff
1- Evaluation of Concept	January	E. Yassuda	C. Cantagallo, C. Reynolds, M. Herrera
2 – Biodiversity Data	January-February	D. French McCay, E. Yassuda	C. Cantagallo, E. Graham
3 – Connection of Data	January-February	D. French McCay, K. Knee	E. Graham, Programmer
4 - Biodiversity Screening Tool	February- mid April	D. French McCay, K. Knee	C. Reynolds, Programmer, M. Herrera
5 – Manual and User Guide	April	D. French McCay, K. Knee	C. Cantagallo, C. Reynolds, E. Graham, Programmer, M. Herrera
6 - Reporting	Interim – March, April, Final- May, June	D. French McCay, E. Yassuda	C. Cantagallo, C. Reynolds, E. Graham, M. Herrera
Other Tasks			
Project Management	Throughout Project	D. French McCay, E. Yassuda, K. Knee	C. Cantagallo, C. Reynolds
Travel	TBD	ASA Staff Member(s) (TBD)	1 ASA Staff Member(s) (TBD)

Deliverables and Timetable:

Deliverable	Due Date
Detailed Work Plan	January 15, 2010
1 st Progress Report	March 1, 2010
2 nd Progress Report	April 1, 2010
Beta Version of Tool	April 15, 2010
Draft Manual and User Guide	May 1, 2010
Two Demonstration Events to IABIN Participants	By June 2010
Final Report	June 30, 2010

Technical Task Descriptions

- 1.) Concept Evaluation by Stakeholders and Intended Tool Users
- 2.) Data Research, Acquisition, and Management (specific to demonstration area)
- 3.) Connection of Data to Web-based Visualization System
- 4.) Development of Biodiversity Screening Tool
- 5.) Manual and User Guide Construction
- 6.) Reporting (Interim and Final)

5. Team Composition and Task Assignment

ASA is a global science and technology solutions company. Through consulting, environmental modeling, and application development, ASA helps a diverse range of clients in government, industry, and academia investigate issues of concern and develop functional solutions. ASA's methods are based on applied science and advanced research. ASA is internationally recognized for its expertise in the development and application of computer models that simulate physical, chemical, and biological processes in marine and freshwater environments. ASA has developed a unique suite of models for estimation of oil and chemical fates and effects, natural resource damage assessment, and research. ASA's oil spill models are the most widely used in the world with hundreds of users and applications. ASA has supported its many clients over the past 30 years with onsite and remote trainings, constant technical support, and continued model development to meet unique needs. ASA has extensive international data experience. In addition to the Middle East project mentioned previously, ASA has worked in South America for 10 years. We have been involved in data collection and modeling in Panama, Chile, Argentina, Venezuela, and Brazil.

The team ASA identified for this project includes members from both the United States and South America (Brazil) offices. Coordinating the effort in the United States will be Dr. Deborah French McCay, a senior principal and biological oceanographer. She will be supported by a Ms. Kelly Knee, a GIS software developer who will oversee the software development of the web-based and site screening tools. Several scientists and programmers will support them to ensure that data is incorporated correctly and the product meets the needs of the users. In Brazil, Dr. Eduardo Yassuda, the principal in ASA's South America office and an ocean engineer, will oversee the efforts to conduct interviews with local decision-makers and support data acquisition and management in Brazil.

6. CVs of Proposed Staff

Key Personnel:

Deborah P. French McCay

Principal – ASA-US | Modeling: Ecosystems, Fates & Effects; Biological Systems

Dr. French McCay (formerly Dr. French) specializes in quantitative assessments and modeling of aquatic ecosystems and populations, pollutant transport and fates, and biological response to pollutants. Her

population modeling work includes models for plankton, benthic invertebrates, fisheries, birds and mammals. She has developed water quality, food web and ecosystem models for freshwater, marine and wetland ecosystems. She is also an expert in modeling oil and chemical fates and effects, toxicity, exposure and the bioaccumulation of pollutants by biota, along with the effects of this contamination. These models have been used for impact, risk, and natural resource damage assessments, as well as for studies of the biological systems. She has provided expert testimony in hearings regarding environmental risk and impact assessments. Currently she is leading the data collection for and development of an offshore renewable energy site screening tool for offshore wind development in Rhode Island.

Experience

Applied Science Associates, Inc.

1984 to present

Environmental Impact Statements/NEPA

- Assessed potential impacts of ichthyoplankton entrainment in seawater intakes and impacts from pipeline and LNG terminal construction and operation, for Environmental Impact Statements for (3 separately) proposed LNG projects off the coast of LA in the Gulf of Mexico and in MA
- Assessed potential impacts of oil spill response alternatives for an Programmatic Environmental Impact Statement, as part of the US Coast Guard rulemaking on response equipment regulations
- Assessed potential impacts of oil spills for two El Segundo Marine Technical Lease Renewals
- Assessed potential impacts of the proposed Quonset Point resource recovery facility on aquatic biota and their consumers for an EIS

Oil and Chemical Spill Fate, Impact and Natural Resource Damage Assessment

- Principal investigator for the Natural Resource Damage Assessment Models for Coastal and Marine Environments (NRDAM/CME) and Great Lakes Environments (NRDAM/GLE) used in "Type A" assessments of damages due to spills of toxic substances under US regulations (Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and of oils under the Oil Pollution Act of 1990 (OPA)).
- Developed biological effects model components of the NRDAM/CME, NRDAM/GLE, and ASA's models SIMAP and CHEMMAP, which estimate pollutant-induced losses in productivity, fisheries yield and wildlife.
- Developed the restoration model components of the NRDAM/CME and NRDAM/GLE, which determine appropriate restoration actions and approximates costs.
- Principal Investigator in the development of biological databases for fishery species and wildlife by habitat and season for 77 coastal, 11 Great Lakes and 10 inland freshwater biological provinces of the United States. These data support the NRDA models.
- Principal Investigator in the development of a Primary Restoration Guidance Manual which evaluates feasibility, effectiveness and success, and costs of restoration of wetland and aquatic natural resources. This supports NOAA's OPA NRDA regulations.
- Provides technical support and modeling to federal and state trustees to estimate fates, injuries and natural resource damages resulting from spills: more than 100 cases
- Provides training to federal and state trustees, industry, and private parties on use of modeling for NRDA, impact and risk assessment.

Modeling and Analysis of Pollutant Fates and Effects, Ecological Risk Assessment

- Modeled impacts of hypothetical spills from ships carrying hazardous wastes to be incinerated at sea; applied to several coastal areas (Gulf of Mexico and North Atlantic) and 10 possible wastes; analyzed worst-case and most-likely scenarios and performed sensitivity analysis.
- Assessment of potential oil spill impacts and natural resource damages for oil platform spills off the coast of Florida, involving conditional probability (trajectory) modeling and worst case analysis. Testified in permit hearings for Coastal Petroleum.
- Principal investigator for modeling fates and ecological risks of discharges of chemical products used in deep water oil and gas operations in the Gulf of Mexico (MMS project, with A.D. Little).

- Principal investigator for modeling analysis of potential spills due to groundings in San Francisco Bay: ecological risk assessment and cost analysis for natural resource damages, response costs and socioeconomic costs (client: Army Corps of Engineers, San Francisco District).
- Modeling analysis of potential spill impacts in Washington state waters; a cost-benefit analysis for Washington Department of Ecology's rulemaking regarding spill response requirements
- Principal investigator for preparation of an Environmental Assessment of hazardous material spill response equipment regulations, a US Coast Guard rulemaking under OPA90

Modeling of Wildlife Population Dynamics and Movements for Impact Assessment

- Developed a population model and a seasonal migration model for the northern fur seal; differences by age and sex were incorporated in the models; analyzed the impact of entanglement in discarded plastics on the northern fur seal population.
- Utilized northern fur seal population and migration models along with an oil spill trajectory model to estimate impacts on the northern fur seal population.
- Bioenergetics modeling to evaluate fish consumption by cormorants and its impact on fish populations in the Narragansett Bay estuary

Fisheries Modeling and Impact Assessment

- Developed population and fisheries model with spatial resolution for eggs, larvae, juvenile and adults; an associated transport model used to distribute eggs and larvae.
- Applied the spatially-resolved population and fisheries model to sea scallops and Atlantic cod on Georges Bank; used this model to estimate potential impacts of off-shore oil development on the populations and fisheries.
- Developed LARVMAP model, which simulates active (directional swimming or sinking) and passive (by currents) movements of eggs, larvae, and other life stages of aquatic biota; used for evaluating potential impacts of development, entrainment and impingement
- Assessed potential impacts of ichthyoplankton entrainment in seawater intakes and impacts from pipeline and LNG terminal construction and operation, for Environmental Impact Statements for proposed LNG projects: two off the coast of Louisiana in the Gulf of Mexico, one in Mount Hope Bay, Massachusetts.

Education

Ph.D.	Biological Oceanography, Graduate School of Oceanography, University of Rhode Island	1984
A.B.	Zoology, Rutgers College	1974

Publications

Dr. French McCay has authored or co-authored 38 journal articles, >120 technical reports, and >50 conference proceedings.

Eduardo A. Yassuda

Principal – ASA-SA | Coastal and Oceanographic Engineer

Dr. Yassuda has extensive experience related to coastal and oceanographic engineering, modeling of hydrodynamics, water quality, and ecological processes in coastal and estuarine systems as his primary focus for the past 15 years. Dr. Yassuda has been actively involved in the implementation and improvements of hydrodynamic models such as CH3D, BFHYDRO, and POM to worldwide locations ranging from equatorial systems, including rivers, estuaries, coastal zones; subtropical Patos lagoon in Brazil, and Tampa Bay, Indian River Lagoon, Lake Okeechobee, Charleston Harbor, Lower Savannah River in the United States.

Experience

Applied Science Associates, Inc.

2000 to present

PETROBRAS Contingency Plan, South Atlantic along the Brazilian Coast, Brazil

- Recognizing the importance of an accurate description of circulation and transport processes in the development of an oil spill contingency plan, this project was centered on the development of hydrodynamic models capable of accurately and realistically simulating ocean processes in the coastal areas. Starting with a modified version of the Princeton Ocean Model, the hydrodynamic models developed for this project are capable of simulating macrotidal environments with flood and drying characteristics, strong baroclinic effects, and wind-driven circulation. As Project Manager, Dr. Yassuda was responsible for the development of hydrodynamic and oil spill model applications to 21 sites along the Brazilian Coast, ranging from subtropical Patos Lagoon to equatorial systems as the Amazon River.

Savannah River Deepening Project, Georgia

- Senior Water Resources Scientist responsible for the application of a 3-dimensional hydrodynamic and water quality model (WQMAP) to the entire Lower Savannah River Estuary. The primary objective of this study was to utilize numerical models and data to evaluate the environmental impacts of various proposed deepening scenarios. One of the key issues in this project was the development and application of a storage volume subroutine that was able to simulate the flood and drying of extensive marsh areas of this system.

Daniel Island Wastewater Master Plan, Charleston, South Carolina

- Senior Water Resources Scientist responsible for the application of a 2-dimensional hydrodynamic and water quality model (WQMAP) to the entire Charleston Harbor Estuarine System. The primary objective of this study was to utilize numerical models and data to evaluate the impacts of increased or additional discharges to the Cooper River on the levels of nutrients, biological and chemical oxygen demand, metals and sediments within the receiving waters.

Education

Ph.D.	Coastal & Oceanographic Engineering (Minor in Environmental Sciences), University of Florida	1996
M.S.	Physical Oceanography, University of São Paulo (Brazil)	1991
B.S.	Mechanical Engineering, Mackenzie University (Brazil)	1986

Publications

Dr. Yassuda has authored or co-authored 20 journal articles, technical reports, and conference proceedings.

Kelly Knee

Water Resources Engineer | GIS Specialist

Ms. Knee is a water resources engineer and geographic information systems (GIS) specialist with Applied Science Associates (ASA). She has a broad engineering and scientific background, including experience in water quality modeling, statistical analysis, operational systems engineering, geographic information systems (GIS), hydrology, and numerical methods. Over her five years at ASA she has created custom GIS solutions for a range of projects including site screening, ecological impacts assessment, advanced query, coastal flooding, pipeline spill management, and bathymetry data integration. Her visualizations of coastal flooding have gained national attention and her coastal risk analyses have been used for both educational and engineering purposes. Prior to joining ASA in 2004 she used a Fulbright Fellowship to study the impacts of sea level rise and storm surge flooding in the country of Mauritius by integrating GIS and systems models. Currently, Ms. Knee is the lead GIS developer on the Abu-Dhabi Coastal Atlas project.

Experience

Applied Science Associates, Inc.

2004 to present

Geographic Information Systems

- Design and implementation of custom ArcGIS tools for site screening, ecological impacts assessment, coastal flooding, pipeline spill management, bathymetry data integration, and water quality modeling.
- Development of ArcGIS-based regional coastal resources atlas including tools for viewing, importing, and exporting data, evaluating impacts of environmental stressors, siting new development, and accessing associated thematic data.
- Developed ArcGIS extension for determination of tidal boundary conditions for input into hydrodynamic models.
- Extensive GIS data acquisition and integration at regional, national, and international scales in support of a variety of modeling projects including inputs for water quality, coastal inundation, pipeline spill, and site assessment models.
- Processing of non-ESRI compatible data (e.g. NetCDF format) for import and analysis in GIS systems.
- Designed custom bathymetry blending system, integrating GIS and MATLAB, to merge disparate bathymetry datasets into a single high-resolution dataset with consistent horizontal and vertical datums and units.
- Developed ArcGIS extension for determination of tidal boundary conditions for input into hydrodynamic models.

Environmental Modeling

- Coastal risk analyses for shoreline facilities including assessment surge, seiche, and wave run-up using a combination of statistical engineering and modeling techniques.
- Execute pipeline breach impact assessments by modeling the fate and transport of oil spills from new or redesigned pipeline systems using ASA's OILMAPLand system.
- Oil spill modeling in support of contingency planning and risk assessment for a series of proposed oil developments around the world using ASA's stochastic OILMAP model to assess the potential impacts of the spills and define worst-case scenarios for further trajectory and fate modeling.
- Simulation and visualization of sea level rise and storm surge flooding for a variety of clients using a custom ArcGIS/Google Earth tool to easily visualize and animate potential flooding in a given area.
- Design and water quality impacts analysis of coastal outfalls using modeling techniques.
- Applied GIS techniques to estimate tidal flooding changes resulting from constriction removal in Gooseneck Cove, Newport, RI.

Data Management and Analysis

- Management of large and complex datasets using ArcSDE including the National Elevation Dataset at both 10 and 30 meter scales and the National Hydrography Dataset at both high and medium resolutions.
- Data analysis, both manual and scripted, in support of a multitude of projects including IOOS pilot projects for Naval Sea-basing and Marine Mammal Avoidance.
- Assisted in the update and management of a user-friendly environmental database and mapping system for Alaskan environmental data.
- Design of data delivery system for the Massachusetts Ocean Partnership's whale and fisheries data.

Course Design and Instruction

- Conduct training courses in the use of oil, chemical, and search and rescue modeling using ASA's suite of water quality models, OILMAP, OILMAPLand, CHEMMAP, & SARMAP.

Education

M.S. Water Resources Engineering, Tufts University

2003

B.S. Environmental Engineering, Tufts University

2001

Support Staff:

ASA-US

Ms. Christin Reynolds, Natural Resources Engineer and Policy Analyst

Ms. Reynolds has a broad background in engineering, science and policy; including experience in geographic information systems (GIS), policy analysis of participatory water management strategies wind feasibility studies, integrated water resource management (IWRM) and stakeholder analyses. At ASA, her work focuses on communicating complex information from model output in simple visual formats. She has been involved in the concept design of Abu Dhabi's coastal atlas site screening tools. She is also a creative lead for coastal atlas vignettes which inform users in a visual format about environmental sensitivity factors in a visual format through animations and visualizations.

Ms. Eileen Graham, Biologist

Ms. Graham has a strong background in marine science including marine ecology and physical/biological estuarine dynamics. Her broad scientific background includes geographic information systems (GIS), ecological modeling, database management, statistics, and biological oceanography. At ASA, her work focuses on ecological impact assessment utilizing ASA's SIMAP program for oil spill fate and biological impact analysis. Prior to joining ASA, Ms. Graham worked as a field-based biologist with experience working in estuaries on the Atlantic and Pacific coasts of the U.S. and received her M.S. in Environmental Science in 2008. Currently, she is compiling data for an offshore renewable energy siting tool that incorporates biological, ecological and human use data to assess the suitability of the offshore environment for development.

Ms. Lola Herrera, Volunteer

After receiving her M.S. in Marine Affairs from the Coastal Resource Center at the University of Rhode Island in 2006, Ms. Herrera worked for the USAID SUCCESS Program in Nicaragua and Ecuador. In these countries, she helped to identify environmental and governance problems in coastal communities and their effects on the livelihoods of the residents and the biodiversity of the environments. She is currently investigating the interaction between the maritime legal structure and ecological components of the Atlantic-Mediterranean waters off of Spain. Ms. Herrera is a native Spanish speaker and has volunteered her time on this project.

ASA-SA

Ms. Camila Cantagallo, Ecologist

Ms. Cantagallo is well versed in the coastal systems of southern Brazil and their sensitivity to impacts due to oil spills. Her skills include GIS, environmental sensitivity mapping, and collecting, organizing, and analyzing biological and ecological data. Before joining ASA in 2008, she received a M.S. from the University of São Paulo State which focused on the environmental sensitivity of the Santos Estuary System to oil spills. Currently, she is coordinating efforts to evaluate the sensitivity and vulnerability of coastal systems and biological communities in Campos Basin, Brazil.

7. Staffing Schedule

	Name	Staff Input						Total staff-month input	
		January	February	March	April	May	June	Home	Total
1	Deborah French McCay	P	P	P	P	P	P	ASA-US	6
2	Eduardo Yassuda	P	P	P	P	P	P	ASA-SA	6
3	Kelly Knee	P	P	P	P			ASA-US	4
4	Camila Cantagallo	F	P		P			ASA-SA	3
5	Christin Reynolds	P	F	P	P	P	P	ASA-US	6
6	Eileen Graham	F	P	P	P	P	P	ASA-US	6
7	Programmer	P	F	F	F	P		ASA-US	5
8	Maria Herrera	P	P	P	P	P		ASA-US	5

P = Part-time effort, F = Full-time effort

8. Work Schedule

The table below indicates the time period in which each major task will be performed. For a list of milestones and deliverables, refer to the table in Section 4, above.

N°	Activity	Months					
		January	February	March	April	May	June
1	Evaluation of Concept						
2	Biodiversity Data						
3	Connection of Data						
4	Biodiversity Screening Tool						
5	Manual and User Guide						
6	Reporting						

Summary of Costs

ASA Budget

Technical Tasks								Other Tasks ¹			
Name/Labor Category	Position Title	1.) Evaluation of Concept	2.) Biodiversity Data	3.) Connection of Data	4.) Biodiversity Screening Tool	5.) Manual and User Guide	6.) Reporting	Project Management	Total 2010 Hours	2010 Hourly Rate	Cost
D. French McCay	Senior Scientist		10	5	5	10	10	10	50	\$201.08	\$10,054
E. Yassuda	Senior Scientist	10	5				5	10	30	\$250.00	\$7,500
K. Knee	Resource Engineer/GIS Specialist			30	30	10		10	80	\$112.19	\$8,975
C. Cantagallo	Scientist/Ecologist	40	30			10	10	20	110	\$120.00	\$13,200
C. Reynolds	Natural Resource Engineer	20			50	10	20	10	110	\$103.73	\$11,410
E. Graham	Scientist/Ecologist		120	20		20	40		200	\$92.54	\$18,508
Programmer	Programmer			120	100	10			230	\$103.73	\$23,858
M. Herrera	Volunteer	10			10	10	10			NA	NA
ODC's											
Travel/Project Meetings											\$8,000.00
Total		70	165	175	195	80	95	60			\$101,505.00

Cost Sharing Breakdown

Project Name	ASA Number	Shared Technology/Expertise	Value of Shared Technology/Expertise
Abu Dhabi Coastal Atlas	07-156	Sight Screening Analysis Tool, Web Portal Technology	\$130,000
Wuhan Wastewater Management	07-075	Web Portal Technology	\$5,000
Massachusetts Ocean Partnership	08-291	Integrating Spatial Data Networks	\$10,000
Oil Spill Vulnerability of Brazilian Shores	06-084	Brazilian Shoreline/Habitat Ecological Spatial Data, Brazilian Vulnerability and Sensitivity Analysis and Expertise	\$60,000
ASA Research Funds		In-kind donation (research hours) ² towards research of biodiversity data and tool development	\$5,000
Total			\$210,000

¹Other Tasks - Project Management and Correspondence with Client

²ASA will donate \$5000 of research and development time internally for this project.

ASA intends to cost share or co-finance \$210,000 from other internal ASA project funds for the proposed project. The projects chosen for cost sharing can contribute existing developed technology and expertise to the proposed project.

Abu Dhabi Coastal Atlas

ASA assisted the Environment Agency of Abu Dhabi (EAD) for the development of a Coastal Resources Atlas and Environmental Vulnerability Index to support coastal management and planning in the Emirate of Abu Dhabi. The Coastal Atlas project provides a web-based GIS system with data analysis tools for evaluating the current and future health of the coastal region. The project provides advanced habitat classification, human and socio-economic resource classifications, and an environmental vulnerability index that allows coastal managers to evaluate possible stresses on the environment. The system provides access to these data for stakeholders including GIS experts, resource managers, scientists, and the general public via desktop software applications and web browsers. Web-based visualization technology and site screening tools developed for the coastal atlas will be adapted and utilized for the proposed project.

Wuhan Wastewater Management

ASA recently developed a web-based tool using Adobe Flex that connected web services to oil and chemical spill models. This tool was designed to assess potential impacts of development on water quality in the Yangtze River, Wuhan, China. Web-based visualization technology developed during this project will be leveraged and adapted for the proposed projects.

Massachusetts Ocean Partnership: Integrated Multi-Use Management, Massachusetts

The Massachusetts Ocean Partnership (MOP) tasked ASA to provide consultation in support of an ocean data network. An ocean data network is an infrastructure of data, systems, services, and tools that allow a variety of users including the public, coastal managers, and research scientists to access “live” and archived data related to coastal and ocean management. This includes maps, observations, and model data. User needs identified were based on reports from the ocean management plan working groups including: Fisheries, Habitat, Ocean Recreation, Cultural Services, Transportation, Navigation, and Infrastructure, Sediment, Renewable Energy. Data integration techniques and expertise developed during the MOP project will be applied to the IABIN data networks used for the proposed project.

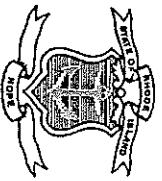
Oil Spill Vulnerability Analysis along the Brazilian Shore

Applied Science Associates South America (ASA-SA) was contracted to do vulnerability analysis for harbors located along Brazilian shore: Guanabara Bay, Ilha Grande (RJ), Santos (SP), and Paranaguá (PR). Coastal sensitivity information was obtained by satellite images and geoprocessed. Vulnerability analysis was carried out using GIS software calculating the intersection between sensitive shorelines and oiling probability. Potential impacts on marine and coastal habitats and aquatic organisms in the area were evaluated. Site specific knowledge of the Brazilian coastal environment and data sets, expertise generated via vulnerability analysis, and geoprocessing techniques will be leveraged for the proposed project.

Legal Status

Please find the legal documents stating the status of both the Brazil and Rhode Island offices in the corresponding PDF file entitled “ASA_Business_Documentation.pdf.”

STATE OF RHODE ISLAND



STATE BOARD OF REGISTRATION
FOR PROFESSIONAL ENGINEERS
BE IT KNOWN THAT

APPLIED SCIENCE ASSOCIATES, INC.

*having given satisfactory evidence that having the qualifications required
by law is hereby authorized to practice*

Professional Engineering

IN THE STATE OF RHODE ISLAND

is a Corporation

IN WITNESS WHEREOF, THE BOARD HAS ISSUED THIS CERTIFICATE OF REGISTRATION
NO. 5247 UNDER THE SEAL OF THE BOARD THIS 13th DAY OF OCTOBER 1993.

STATE BOARD OF REGISTRATION FOR
PROFESSIONAL ENGINEERS

Robert Scott
CHAIRMAN


Raymond D. Brinkell
SECRETARY



Comprovante de Inscrição e de Situação Cadastral

Contribuinte,

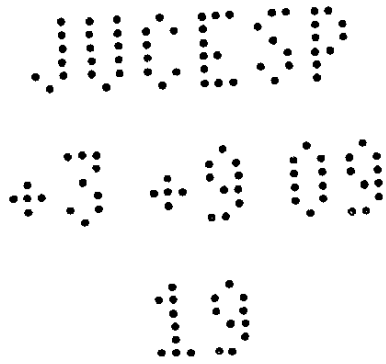
Confira os dados de Identificação da Pessoa Jurídica e, se houver qualquer divergência, providencie junto à RFB a sua atualização cadastral.

 REPÚBLICA FEDERATIVA DO BRASIL CADASTRO NACIONAL DA PESSOA JURÍDICA			
NÚMERO DE INSCRIÇÃO 56.088.990/0001-16 MATRIZ	COMPROVANTE DE INSCRIÇÃO E DE SITUAÇÃO CADASTRAL		DATA DE ABERTURA 23/07/1986
NOME EMPRESARIAL APPLIED SCIENCE CONSULTORIA LTDA			
TÍTULO DO ESTABELECIMENTO (NOME DE FANTASIA) ASA SOUTH AMERICA			
CÓDIGO E DESCRIÇÃO DA ATIVIDADE ECONÔMICA PRINCIPAL 71.12-0-00 - Serviços de engenharia			
CÓDIGO E DESCRIÇÃO DAS ATIVIDADES ECONÔMICAS SECUNDÁRIAS Não informada			
CÓDIGO E DESCRIÇÃO DA NATUREZA JURÍDICA 206-2 - SOCIEDADE EMPRESARIA LIMITADA			
LOGRADOURO R FIDALGA	NÚMERO 711	COMPLEMENTO	
CEP 05.432-070	BAIRRO/DISTRITO VILA MADALENA	MUNICÍPIO SAO PAULO	UF SP
SITUAÇÃO CADASTRAL ATIVA		DATA DA SITUAÇÃO CADASTRAL 24/09/2005	
MOTIVO DE SITUAÇÃO CADASTRAL			
SITUAÇÃO ESPECIAL *****		DATA DA SITUAÇÃO ESPECIAL *****	

Aprovado pela Instrução Normativa RFB nº 748, de 28 de junho de 2007.

Emitido no dia **09/01/2009** às **10:22:47** (data e hora de Brasília).

Voltar



11ª ALTERAÇÃO E CONSOLIDAÇÃO DE CONTRATO SOCIAL

APPLIED SCIENCE CONSULTORIA LTDA

CNPJ/MF nº 56.088.990/0001-16

NIRE 35.216.328.640

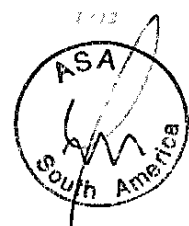
Datada de 25 de agosto de 2009

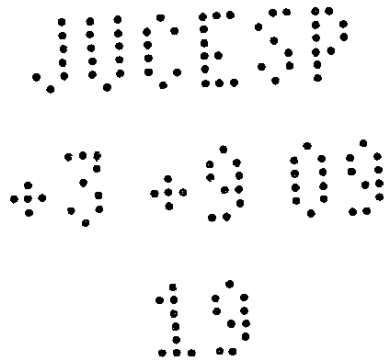
Pelo presente instrumento particular de alteração contratual, os abaixo assinados:

EDUARDO AYRES YASSUDA, brasileiro, casado em regime de comunhão parcial de bens, engenheiro, portador da cédula de identidade RG nº 9.363.188-1/SSP-SP e do CPF/MF: 094.409.448-11, residente e domiciliado na Alameda Piunas, 160, Aldeia da Serra, Santana de Parnaíba, SP, CEP: 06519-390;

APPLIED SCIENCE ASSOCIATES, INC, sociedade norte Americana, com sede em 70 Dean Knauss Drive, Narragansett, Rhode Island 02882, USA, inscrita no CNPJ/MF sob nº 05.717.142/0001-98, neste ato representada por seu procurador Eduardo Ayres Yassuda, acima qualificado, em conformidade com a procuração outorgada em 12 de Fevereiro de 2001, devidamente legalizada e registrada sob nº 164.559 em 18/07/2001 junto ao 1º Registro de Títulos e Documentos do Município ed Barueri, Estado de São Paulo.

11ª ALTERAÇÃO E CONSOLIDAÇÃO DE CONTRATO SOCIAL





GABRIEL CLAUZET, brasileiro, divorciado, portador da cédula de identidade R.G. nº 20.876.724-1 e do CPF/MF: 188.764.658-20, residente e domiciliado na Rua Girassol, 584, aptº 402B, Vila Madalena, São Paulo, CEP: 05433-001.

Únicos sócios da sociedade empresária limitada **APPLIED SCIENCE CONSULTORIA LTDA**, inscrita no CNPJ/MF sob nº 56.088.990/0001-16, sediada na Rua Fidalga nº 711, Vila Madalena, São Paulo, SP, CEP: 05432-070, com seus Atos constitutivos devidamente registrados no 5º Cartório de Registro Civil de Pessoas Jurídicas do Estado de São Paulo sob o nº 5235 em sessão de 18/07/1986, e posteriormente arquivados na Junta Comercial do Estado de São Paulo sob NIRE nº 35.216.328.640 em sessão de 05/06/2000, e última Alteração de Contrato Social (10ª alteração) arquivada sob nº 169.892/09-8 em sessão de 19/05/2009, resolvem, em comum acordo, alterar o contrato social de acordo com as deliberações que seguem:

I – OBJETO SOCIAL

A sociedade terá como objeto social a Prestação de Serviços de Consultoria em Modelagem Computacional da Mecânica de Fluidos e Levantamentos Hidrográficos em Sistemas Lacustres, Fluviais e Oceanográficos.

Encerrando as deliberações desta data, resolvem, por unanimidade, consolidar o contrato social da sociedade, que passará a ter a seguinte redação:

----- 000000 -----

11ª ALTERAÇÃO E CONSOLIDAÇÃO DE CONTRATO SOCIAL

2 / 12



JUCESP

03 09 09

CONSOLIDAÇÃO CONTRATUAL

APPLIED SCIENCE CONSULTORIA LTDA

CNPJ/MF nº 56.088.990/0001-16

NIRE 35.216.328.640

DENOMINAÇÃO SOCIAL

CLÁUSULA PRIMEIRA

A sociedade girará sob denominação social de “**APPLIED SCIENCE CONSULTORIA LTDA**”, podendo ainda utilizar para fins de divulgação o nome fantasia “**ASA SOUTH AMERICA**”.

SEDE

CLÁUSULA SEGUNDA

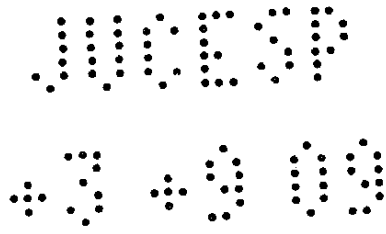
A sociedade terá sua sede na Rua Fidalga n.º 711, Vila Madalena, São Paulo, SP, CEP: 05432-070.

Parágrafo único – A sociedade poderá abrir ou extinguir filiais, agências, depósitos ou escritórios em qualquer parte do território nacional ou exterior, mediante resolução dos sócios.

1ª ALTERAÇÃO E CONSOLIDAÇÃO DE CONTRATO SOCIAL



7/12



TEMPO DE DURAÇÃO

CLÁUSULA TERCEIRA

O tempo de duração da sociedade é indeterminado.

OBJETO SOCIAL

CLÁUSULA QUARTA

A sociedade terá como objeto social a Prestação de Serviços de Consultoria em Modelagem Computacional da Mecânica de Fluidos e Levantamentos Hidrográficos em Sistemas Lacustres, Fluviais e Oceanográficos.

CAPITAL SOCIAL

CLÁUSULA QUINTA

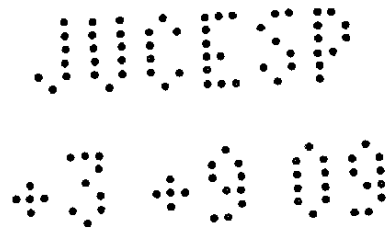
O capital social, totalmente subscrito e integralizado, em moeda corrente nacional, é de R\$ 150.000,00 (Cento e Cinquenta Mil Reais), dividido em 150.000 (Cento e Cinquenta Mil) quotas, com valor nominal de 1,00 (Um Real) cada uma, assim distribuídas entre os sócios:

<i>Sócios</i>	<i>Quotas</i>	<i>Valor</i>	<i>Percentual</i>
APPLIED SCIENCE ASSOCIATES, INC.	116.250	R\$ 116.250,00	77,50 %
EDUARDO AYRES YASSUDA	32.250	R\$ 32.250,00	21,50 %
GABRIEL CLAUZET	1.500	R\$ 1.500,00	1,00%
TOTAL	150.000	R\$ 150.000,00	100,00 %

Parágrafo Primeiro – A responsabilidade de cada sócio é restrita ao valor de suas quotas, porém todos os sócios respondem solidariamente pela integralização do capital social.

Parágrafo Segundo - As quotas são indivisíveis e a cada quota corresponde a um voto nas deliberações sociais.





ADMINISTRAÇÃO E REMUNERAÇÃO

CLÁUSULA SEXTA

A sociedade será regida e administrada pelo sócio administrador EDUARDO AYRES YASSUDA, com a denominação de "Presidente", o qual terá os mais amplos poderes para validamente administrar a sociedade de acordo com as Cláusulas desta alteração e consolidação de contrato social, distribuindo os diversos encargos e serviços da sociedade, podendo, entre eles:

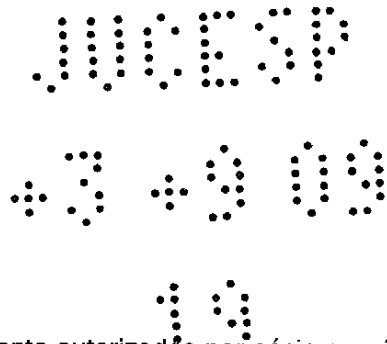
- (a) Nomear, constituir e destituir procuradores, inclusive com poderes constante da Cláusula "ad judicia" e "ad negotia";
- (b) Nomear e destituir gerentes para funções técnicas específicas;
- (c) Cumprir a política geral de investimentos e operações da sociedade estabelecida pelos sócios e prestando contas aos mesmos anualmente, por ocasião do encerramento do exercício social;
- (d) Representar a sociedade ativa e passivamente, em juízo ou fora dele;
- (e) Representar a sociedade perante Bancos em geral, Repartições Públicas Federais, Estaduais ou Municipais, Autarquias, Tesouro, Sociedades de Economia Mista, Empresas de Leasing e Financeiras, podendo para tanto alegar, promover, pagar, receber, assinar, recibos e inscrição, prestar fianças, dar cauções e endossar duplicatas, bem como sacar títulos de créditos sem qualquer limite;
- (f) Propor e assinar contratos públicos ou particulares.

Parágrafo Primeiro – Fica expressamente vedado o uso da denominação social em avais, fianças, cauções, endossos e títulos de favor, contrários aos objetivos sociais ou estranhos aos seus interesses.

Parágrafo Segundo – O Sócio Administrador fica dispensado da prestação de caução.

Parágrafo Terceiro – São expressamente vedados, sendo nulos e inoperantes em relação à sociedade, os atos de quaisquer dos sócios, administradores, procuradores ou empregados que a envolverem em obrigações em favor de terceiros, relativas a negócios ou operações estranhas aos objetivos sociais, exceto nos casos de operações envolvendo obrigações relativas a operações e atividades de apoio à sociedade, tais como a obtenção de empréstimos, contratos de financiamento, contratos de serviços e de aluguéis, bem como operações envolvendo empresas do seu grupo econômico, ou salvo quando





expressamente autorizados por sócio ou sócios que detiverem no mínimo 90% (noventa por cento) do capital social.

Parágrafo Quarto – O administrador **EDUARDO AYRES YASSUDA**, de acordo com o artigo 1011, parágrafo primeiro, da lei nº 10.406, de 10 de Janeiro de 2002, declara, sob as penas da lei, que não está impedido de exercer a administração da sociedade, por lei especial, ou em virtude de condenação criminal, ou por se encontrar sob os efeitos dela, à pena que vede, ainda que temporariamente o acesso a cargos públicos ou por crime falimentar, de prevaricação, peita ou suborno, concussão, peculato ou contra a economia popular, contra o sistema financeiro nacional, contra normas de defesa da concorrência, contra as relações de consumo, fé pública ou a propriedade.

Parágrafo Quinto - Ao sócio administrador e aos demais sócios, quando no exercício de atividades de natureza administrativa ou técnica, conforme sejam demandadas pela sociedade a seu único critério e em seu exclusivo benefício, poderá ser atribuída remuneração a título de “pro labore”, cujo valor será fixado por sócios detentores de 90% (noventa por cento) do capital social, atendendo a disponibilidade financeira da sociedade.

CLÁUSULA SÉTIMA

O Presidente assume também a parte técnica das atividades sociais, figurando como Engenheiro responsável perante o Conselho Regional de Engenharia, Arquitetura e Agronomia do Estado de São Paulo – CREA, registrado sob nº 0601847385 e portador da carteira – CREA/SP nº 184738/D, devidamente qualificado no preâmbulo do presente instrumento.

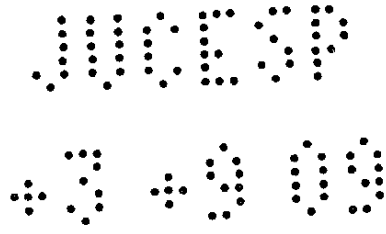
CESSÃO E TRANSFERÊNCIA DE QUOTAS

CLÁUSULA OITAVA

O sócio que desejar retirar-se da sociedade ou transferir, no todo ou em parte, suas quotas do capital a terceiros, deverá comunicar os demais sócios por escrito, com antecedência mínima de 60 (Sessenta) dias.

Parágrafo Primeiro – Sem prejuízo do disposto no caput, o ingresso de novos sócios na sociedade estará sujeito à aprovação previa e expressa por escrito dos sócios representantes de 90% (Noventa por Cento) do capital social.





Parágrafo Segundo – Se a sociedade nem os sócios usarem o direito de preferência no prazo indicado no parágrafo anterior, o sócio retirante terá o direito à liquidação de sua quota, com o recebimento do valor patrimonial da mesma em 6 parcelas mensais iguais.

Parágrafo Terceiro – Caso a cessão e transferência não sejam feitas nas formas mencionadas, estas serão nulas de pleno direito.

DISSOLUÇÃO E LIQUIDAÇÃO

CLÁUSULA NONA

A morte incapacidade superveniente, exclusão e/ou retirada de um dos sócios não acarretará a dissolução da sociedade, esta continuará mediante acordo entre os sócios remanescentes, quando será facultado a um dos herdeiros ou sucessores do sócio falecido ou incapacitado ingressar na sociedade, sub-rogando-se em todos os direitos e obrigações do sócio falecido. Na pendência do inventário, a representação será feita pelo inventariante.

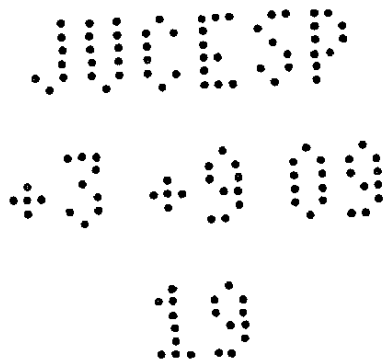
Parágrafo Primeiro – Caso nenhum dos herdeiros deseje ingressar na sociedade, as quotas do sócio falecido serão colocadas à venda, respeitadas as regras para cessão de quotas contempladas na Cláusula Oitava.

Parágrafo Segundo – Terá início em até 10 dias da ciência do ocorrido, um balanço especial para apuração do valor dos haveres do sócio interdito, insolvente ou falido, que deverá estar concluído dentro de 60 (Sessenta) dias, cujo valor será estabelecido pelo ativo líquido apurado no referido balanço, dividido pelo número de quotas sociais, multiplicando-se o respectivo quociente pelo número de quotas, procedendo-se a devida alteração de contrato social. No caso de falência, serão adotadas as providências cabíveis.

Parágrafo Terceiro – Os haveres do sócio falecido ou incapacitado serão pagos em 12 (doze) prestações mensais, consecutivas, acrescidas de juros de 12% (doze por cento) ao ano e corrigidas de acordo com a variação do IGPM-FGV eventualmente ocorrido entre o mês da data base do levantamento do citado balanço especial e o respectivo mês de pagamento da correspondente parcela mensal, a partir de 30 (trinta) dias da conclusão do balanço e os demais, subsequentes a cada 30 dias.

Parágrafo Quarto – A sociedade será dissolvida e liquidada conforme previsto na lei e por decisão aprovada pelos sócios representantes de no mínimo 90% (noventa) do capital social, em estrita conformidade com procedimentos aplicáveis à liquidação de sociedades.





EXERCÍCIO SOCIAL E BALANÇOS

CLÁUSULA DÉCIMA

O exercício social terá início em 01 de Janeiro e terminará em 31 de Dezembro de cada ano, ocasião em que serão elaborados o balanço patrimonial e as demais demonstrações financeiras necessárias, as serem apresentadas aos sócios para apreciação e deliberação sobre as mesmas no primeiro quadrimestre seguinte ao término do exercício social, conforme Cláusula Décima Primeira. Até 30 (trinta) dias antes da data da reunião de sócios que deliberará sobre o balanço patrimonial e as demais demonstrações financeiras necessárias, estes documentos deverão ser disponibilizados aos sócios, na sede da sociedade ou encaminhados aos mesmos por meio de carta com Aviso de Recebimento ou protocolo.

Parágrafo Primeiro – Para a finalidade de apurar ou distribuir lucros, a sociedade poderá elaborar balanços referentes a períodos menores ao longo do exercício social.

Parágrafo Segundo – A sociedade destinará os lucros segundo decisão dos sócios, e estes poderão receber participação nos resultados da sociedade desproporcional às respectivas participações no capital social, conforme for expressamente deliberado pelos mesmos no momento oportuno.

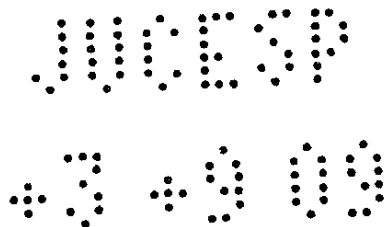
DELIBERAÇÕES SOCIAIS

CLÁUSULA DÉCIMA PRIMEIRA

Os sócios reunir-se-ão pelo menos uma vez por ano, nos quatro meses seguintes ao término do exercício social com o objetivo de tomar as contas dos administradores e deliberar sobre o balanço patrimonial e o resultado econômico, designar administradores, se for necessário, e tratar de quaisquer outros assuntos constantes da ordem do dia.

Parágrafo Primeiro – A convocação será feita por qualquer dos administradores constituídos, por meio de carta com aviso de recebimento, com antecedência mínima de 8 (oito) dias de realização da reunião na primeira convocação e de 5 (cinco) dias na demais, ficando dispensada tal formalidade





quando todos os sócios comparecerem ou se declararem, por escrito, clientes do local, data, hora e ordem do dia, da reunião.

Parágrafo Segundo – As demais matérias passíveis de deliberação ao longo do exercício social serão objeto de realização de reunião de sócios mediante convocação por qualquer dos administradores constituídos, através de e-mail, fax, ou correspondência registrada, com antecedência mínima de 8 (oito) dias.

Parágrafo Terceiro – Dependem sempre do voto afirmativo de sócios detentores de 90% (noventa por cento) das quotas sociais, as seguintes decisões, relativamente aos negócios sociais:

- (a) a participação da sociedade como sócia, acionista ou quotista, em outras sociedades;
- (b) aumento de capital social;
- (c) a estipulação dos valores de pró-labore, honorários e gratificações;
- (d) a tomada de empréstimos;
- (e) a compra, venda e constituição de ônus sobre bens ou direitos sociais;
- (f) a delegação a terceiros, não sócios, de poderes específicos de administração;
- (g) a orientação geral dos negócios da sociedade;
- (h) a destituição e alteração, motivada ou não, do sócio administrador e do diretor;
- (i) a incorporação, fusão ou dissolução da sociedade;
- (j) alteração de tipo societário;
- (k) pedido de concordatas; e
- (l) criar cargos dentro da estrutura funcional da empresa.
- (m) decidir sobre a exclusão automática e extra-judicial de sócio minoritário por justa causa, assim entendidas aquelas relacionadas na cláusula Décima Segunda deste contrato social.

Parágrafo Quarto – As demais deliberações serão tomadas por maioria dos votos, salvo quorum específicos previsto na legislação em vigor ou no presente instrumento.



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Parágrafo Quinto – Torna-se dispensável a reunião quando todos os sócios decidirem, por escrito, sobre a matéria que seria objeto da mesma.

EXCLUSÃO DE SÓCIO

CLÁUSULA DÉCIMA SEGUNDA

Por deliberação de sócios detentores de 90% (noventa por cento) do capital social, tomada em reunião especialmente convocada para esse fim, sócios minoritários poderão ser excluídos extrajudicialmente da sociedade, por justa causa. O sócio minoritário deverá ser convocado para a reunião, com 03 (três) dias úteis de antecedência à data de sua realização, a fim de que possa comparecer e exercer o seu direito de defesa.

Parágrafo Primeiro - Para efeito desta cláusula, serão considerados atos de justa causa (i) prática de atos que infrinjam o presente contrato social ou as leis em vigor; (ii) concorrência com a sociedade; (iii) divulgação de informações confidenciais a quaisquer terceiros; (iv) espionagem; (v) desvio de clientela;

Parágrafo Segundo - Uma vez aprovada a exclusão do sócio minoritário, suas quotas reverterão para um dos sócios administradores, a critério dos mesmos, renunciando expressamente os demais, relativamente a tais quotas, ao exercício do direito de preferência que lhes compete por força de lei.

Parágrafo Terceiro - O pagamento dos haveres do sócio retirante, será feito após apuração do respectivo valor nominal contábil das quotas de sua titularidade, e será realizado em 6 (seis) parcelas mensais e sucessivas, corrigidas pelo índice geral de preços (IGPM) da Fundação Getúlio Vargas (FGV).



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Parágrafo Quarto - Em caso de extinção deste índice, ora fixado, os sócio-quotistas remanescentes poderão optar por qualquer outro, em substituição, que reflita a correção monetária integral, livre de expurgos inflacionários e que reflita variação do valor da moeda nacional.

DISPOSIÇÕES FINAIS

CLÁUSULA DÉCIMA TERCEIRA

Mediante deliberação da maioria dos demais sócios, pode qualquer dos sócios ser excluído judicialmente por falta grave no cumprimento de suas obrigações, ou ainda, por incapacidade superveniente.

Parágrafo Primeiro – Para os efeitos deste Contrato Social, considera-se falta grave, com margem para sua exclusão, o sócio que comprometa, por atos ou omissões, o andamento normal da sociedade, ou o desenvolvimento dos negócios e do objeto social e que não cumpra seus deveres e responsabilidades para com os demais sócios da sociedade, os que nela trabalham e para com a comunidade em que atua, cujos direitos e interesses deve lealmente respeitar e atender.

CLÁUSULA DÉCIMA QUARTA

A sociedade rege-se pelas disposições do presente contrato e, nas omissões pela legislação que regulamenta as sociedades limitadas e nas omissões desta última, supletivamente, pelos dispositivos da Lei das sociedades por ações.

CLÁUSULA DÉCIMA QUINTA

Toda e qualquer Cláusula deste Contrato Social poderá ser, a qualquer tempo, alterada, retificada, ou aditada por deliberações do sócio ou sócios que detiverem, no mínimo 90% (noventa por cento) do capital social.



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CLÁUSULA DÉCIMA SEXTA

Fica eleito o foro central da Comarca de São Paulo, com exclusão de qualquer outro, por mais privilegiado que seja, para dirimir quaisquer controvérsias decorrentes do presente Contrato Social.

E assim, por estarem justos e contratados, assinam o presente instrumento em 03 (Três) vias de igual teor e forma, na presença de (duas) testemunhas.

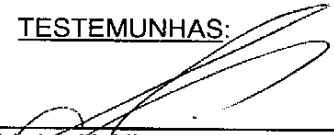
São Paulo, 25 de Agosto de 2009.

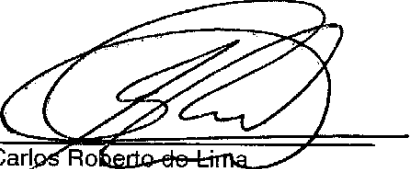
P.p. 
APPLIED SCIENCE ASSOCIATES, INC.
Eduardo Ayres Yassuda


EDUARDO AYRES YASSUDA


GABRIEL CLAUZET

TESTEMUNHAS:

1 
Cristina M. Mine
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CPF 006.101.178-90

2 
Carlos Roberto de Lima
RG 11.413.804-7 (SSP/SP)
CPF 948.452.558-04

Advogada: 
Gisela Cesar Maldonado Prandini
OAB/SP 136.166



JUCESP

1ª ALTERAÇÃO E CONSOLIDAÇÃO DO CONTRATO SOCIAL

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