



Guidelines for Research Activities at Georgia Aquarium

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Summary

Georgia Aquarium recognizes the value of excellent science as the basis of an understanding of all marine life, as well as a vehicle to better husbandry, education, exhibitry and conservation practices. This is codified in the research mission of *excellence in Aquarium Science*. This mission will be achieved primarily through collaborative research that will keep Aquarium staff actively and intellectually engaged in the subject matter and the scientific community, and which will be integrated into the Education and Guest Programs goals such that non-research staff, students and aquarium guests will all benefit from our research efforts. Research will be focused in areas that inform our collection and maximise benefits from the expertise of our staff. This approach will strengthen ties with researchers and institutes that share our institutional passion for understanding marine life, as well as promoting the aquarium and its broader mission to the general public.

Key information:

- Research Committee will meet regularly to discuss collaborative proposals and budget disbursement
- Internal and external proposals for collaboration are due October 15th for financial support in the following year. Proposals not requiring funding can be submitted at any time.
- Research Committee will review these proposals annually in the case of funded proposals and on an *ad hoc* basis otherwise; they must conform to the guidelines spelled out herein
- Proposals that focus on GAI *centers of interest* will have the greatest chance of success. These are: whale sharks, beluga whales, dolphins, coral reefs and Georgia watersheds
- Projects are 12 months in duration to match the annual budget cycle, but can be renewed.
- Each project is required to have at least one GAI staff member as an associated investigator
- GAI staff members are expected to have authorship on papers arising from the work
- Acknowledgement of GAI funding support is expected in peer reviewed papers and conference presentations arising from the work.
- As a condition of partnership, investigators will agree to submit regular progress reports when requested by the Director of Research and Conservation
- Within 60 days of completing a project, investigators will submit a more detailed final report
- Continued funding support is dependent on publication in peer reviewed journals
- Drafts of publications are subject to review by the GAI Research Committee prior to submission.

1.0 Mission

To achieve excellence in aquarium science by fostering the intellectual passion of our staff and colleagues and sharing that passion with our guests and society as a whole.

2.0 Goal

To have Georgia Aquarium be rightly considered by the scientific community, our guests and the public as the leader in research on our chosen areas of aquarium science by building new knowledge about the biology, health and husbandry of aquatic organisms.

3.0 Imperatives

To preserve focus and achieve the mission and goal, research needs to meet the following imperatives:

1. Solve problems for, or serve the knowledge needs of, the aquarium
2. Promote the Aquarium in the science community and to the public
3. Be consistent with our Centers of Interest (section 4.3)
4. Be safe and ethical for staff and any animals involved in the research
5. Enhance the professional development of our staff
6. Inform our guests through integration with Education and Guest Programs
7. Enhance partnerships with other facilities, institutes and universities

These imperatives should be considered the driving forces that shape research activities of Georgia Aquarium (hereafter “the Aquarium”) and the main criteria by which proposals are evaluated.

4.0 Definitions

4.1 Research

Research is a process of systematic inquiry to gather evidence or establish facts with respect to a given topic or question. Research usually applies the scientific method, an iterative process wherein a hypothesis is raised by observation, then tested using appropriate methods, and finally the hypothesis is accepted, rejected, or a new hypothesis is generated. *Exploratory research* is systematic inquiry without hypothesis-testing; this category would include activities like faunal and other surveys. Research at the Aquarium may be either hypothesis-driven or exploratory. The majority of research (but not all) relates to natural phenomena. Market research is excluded from the definition of research used here.

4.2 Research Strategy

The preferred model by which research takes place at the Aquarium is through **collaborative partnerships**. Under this model, research takes place in cooperation with staff of other facilities, institutes or universities (= *outside investigators*), but in all cases staff of the Aquarium participate actively (= *inside investigators*). Aquarium staff may be principal investigators, or they may be associate investigators with a principal outside investigator. Projects without inside investigators are discouraged because they do not further the professional development of our staff, the Aquarium has less control over the direction of the research activity, and it is harder to integrate the research

activity with the education and guest programs, thus making it hard to achieve the goal and mission of research at the Aquarium.

In exceptional instances, research may be carried out with financial or in-kind support from the Aquarium but without direct involvement of GAI staff. Such instances might include those where there is no appropriate staff expertise in-house, but the project is still considered to be of pressing need or high priority by the Research Committee (see Research Process).

4.3 Centers of Excellence

With so many species in our collection and in the aquatic habitats of the world, it is necessary to define focus areas or *Centers of Excellence* to guide the research program at the Aquarium. Within the broader field of aquarium science, here defined as “the study of topics relevant to the operation and inhabitants of public aquariums”, a convenient method for achieving this is to build on the unique aspects of our collection (Imperative 3). This also ensures that most projects will meet Imperative 1. To that end, the following biological and husbandry topics may be favoured for support by the Research Committee.

- *Whale sharks* – a flagship species for GAI
- *Manta rays* – a flagship species for GAI
- *Beluga whales* - a flagship species for GAI
- *Dolphins* - a flagship species for GAI
- *Coral reefs*: biology/husbandry of reef fishes or reef-forming corals
- *Georgia Watersheds*: biology/husbandry of Georgia watershed animals or ecosystems, from rivers to coastal habitats

Other non-biology projects that meet the research imperatives of the Aquarium will also be considered, including:

- Projects aiming to better understand and improve the functions of life-support systems
- Projects aiming to develop or enhance aquaculture skills within the context of aquarium husbandry and animal conservation
- Projects aiming to understand the impacts of our exhibits on guests, especially with respect to conservation or education aims
- Projects aiming to better understand the impacts of our education programs

4.4 Research Products

Research productivity can be measured in many ways; the following will be considered tangible products:

- Publications in refereed journals
- Presentations at national and international conferences
- Presentations to Aquarium staff and guests
- Fact sheets or research summaries
- Media coverage generated by research activities
- Students gaining qualifications as a result of work on approved Aquarium research projects

5.0 Research Process

5.1 Research Committee

All research conducted under the auspices of Georgia Aquarium must be considered and approved by the Research Committee. This committee is composed of interested managers, directors, Vice-Presidents and Senior Vice Presidents. The principal role of the committee is to evaluate proposals to determine whether they meet the research imperatives and are consistent with the Aquarium's research goals and ethical standards. The committee also critically evaluates funding requests, progress reports and final reports, and reviews publications arising from Aquarium-sponsored research projects.

The Research Committee meets regularly and between meetings conducts business via email.

Tangible research productivity on all projects approved by the Research Committee will be tracked by the chair and reported annually to the CEO, along with an interpretation of the intangible benefits of the Aquarium's research activities.

5.2 Application process

Proposals for collaborative research must be submitted to the Research Committee by the principal investigator and must be submitted regardless of whether or not funding support is sought as part of the proposal. Electronic submission as an email attachment is preferred, in order to reduce paperwork. **Proposals requiring funding commitment from the aquarium are due on OCTOBER 15th** in order to be considered for the following year's funding round. Application packages should consist of the following:

1. *Proposal narrative* – Outlines the phenomenon under investigation, the motivation for its study and states any hypotheses, as well as listing the expected research outcomes. Most importantly, the narrative should explicitly state how the project will meet the research imperatives listed in section 3.0. Narratives should be kept to 5 letter-sized single-spaced pages with 1-inch margins and a font size no smaller than 11pt.
2. *Research products* – Proposals should clearly identify tangible research products to be produced (section 4.4) in the "outcomes" section of the narrative **and** on the timeline. Intangible products should also be discussed in the narrative.
3. *Timeline* – a timeline of the proposed work, indicating key dates, activities and milestones
4. *Budget* – if funding support is requested, the proposal should include a detailed tabulated budget outlining the breakdown of funds requested. This should be followed by a text rationale explaining, if necessary, elements of the budget. Matching funds and their sources should also be described. A budget template is available from the chair of the Research Committee.
5. *Biomaterial request* – if the proposal includes the use of biological materials belonging to the aquarium and/or derived from the collection, then a biomaterial request form is required. The blank of this form is available from the chair of the Research Committee.
6. *Supporting documents* – the proposal should be accompanied by *curricula vitae* of all the investigators, so that the research committee can evaluate their

capacity for successfully executing the proposed work. Letters of support from partner institutions should also be attached.

Proposals are evaluated against the Research Imperatives (section 3.0), the research products to be produced and whether the work is consistent with the mission and public image of the Aquarium. Scientific merit is a primary consideration, but whether the project addresses a specific husbandry issue, along with the value of the project to our Education programs, Guest Programs activities or Public Relations department, are all important factors.

If an inside investigator is a member of the Research Committee, then that person must recuse themselves from the evaluation process for that proposal.

Investigators should expect to hear back on the fate of their application within 2 weeks after a scheduled Research Committee meeting. At that time a proposal may be:

1. approved "as is",
2. approved with minor changes (resubmission not required),
3. returned to the investigator for major modification and future resubmission, or
4. rejected outright.

After projects have been approved by the Research Committee, any that need IACUC approval will go to that committee automatically and the investigators notified.

Investigators may be required to explain aspects of their proposal to the IACUC and should be prepared to attend an IACUC meeting if required.

5.3 Progress reports

A progress report is required for all approved projects at the 6 month mark or whenever requested by the Director of Research and Conservation. They should clearly identify any tangible research products since the last report and copies of these products should be attached. Progress reports should be short and punchy.

A final report is also required, which should be a more detailed document describing the progress of the project and its final conclusions. The final report should clearly state whether the project objectives were achieved and whether hypotheses were accepted or rejected, along with any new hypotheses generated. If continued funding will be sought, a new proposal will be required, but the final report can include a section on suggested future research hypotheses.

5.4 Research stipulations

Several stipulations accompany collaborative research with the Aquarium, regardless of whether funding support is requested. These include the following:

5.4.1 Accountability – The Aquarium reserves the right to audit research expenses associated with funding support provided by the Aquarium and to withdraw funding and/or approval from any project that is found by the Research Committee not to be meeting its stated goals or the research imperatives of the Aquarium, or to be otherwise contrary to the missions and public image of the Aquarium.

The Aquarium will expect free and unfettered access to data and research products generated as a result of collaborative research efforts.

5.4.2 Publications – Publications are expected to be a major tangible research product of collaborative partnership with the Aquarium. As a general rule, Aquarium staff members that are investigators on collaborative research projects should be authors on publications arising from such work. It is a condition of participation in approved projects that the Research Committee review manuscripts arising from approved projects before they are submitted for publication. This review is not for the purposes of censoring the scientific subject matter, but to allow the committee a chance to recognize any potential Public Relations opportunities or pitfalls inherent in the work. In the event that the Research Committee feels that publication would be contrary to the best interests of the Aquarium, they may ask that the investigator consider not publishing the work or revising it in such a way as to not be damaging to the public image of the Aquarium. Failure to comply with such a request is likely to result in further action, including (but not limited to) withdrawal of all present and future support.

5.4.3 Presentations – From time to time, the Aquarium may request that an investigator visit the aquarium to make a presentation to staff or guests on the progress of their research. Similarly, if the Aquarium's Public Relations staff wishes to highlight the research for internal or external communications, they may wish to speak with an investigator about such engagements. Investigators are expected to comply with these requests as a condition of participation in approved projects.

5.4.4 Conferences – In general, the Research Committee will not need to review conference presentations for public relations value, but the Director reserves the right of review at his/her discretion. Aquarium staff members that are investigators on collaborative research projects should be authors on conference presentations or abstracts arising from such work. Georgia Aquarium should also be acknowledged in presentations made based on approved projects. The *G-fish* logo should be used in PowerPoint presentations of this kind on either the title slide or an Acknowledgements slide; an approved electronic copy of this logo is available from the chair of the Research Committee. An electronic copy of the presentation should be filed with the chair of the Research Committee after the conference.

5.4.5 Integration – Research Imperative 5 seeks to integrate research with other branches of the Aquarium's operation, to take maximum advantage of the public outreach power of the institution to reach the minds and hearts of the public. To that end, investigators on all approved projects are expected to participate actively in the integration process, and proposals with well-described integration activities are likely to be favoured by the Research Committee. Integration may be through the production of written or rich content products (fact sheets, lesson plans) for use in the Education or Guest Programs departments, or the production of displays, interpretive graphics or footage that explain research activities to education groups and the general guest population. Costs for these activities are borne by the Aquarium and need not be included in project budgets. Investigators may wish to discuss ideas for integration activities with the chair of the Research Committee prior to submitting a proposal. Failure to participate in integration activities is grounds for withdrawal of support and project approval by the Aquarium.

6.0 Research Funding

As a non-profit entity with entertainment, education and conservation missions, the Aquarium has a limited research budget. Investigators may, however, request funds to support research projects as part of their proposal; these requests will be evaluated by the Research Committee. Projects carried out as a collaborative partnership may be sponsored either wholly by the Aquarium or wholly by the collaborating partner, but preferably through shared contributions, with real funds or in-kind support from the outside institution regarded as matching funds. The details of such arrangements must be clearly spelled out in the budget rationale for the proposal, along with any other funding sources that will be applied to the project. This information is necessary for the Research Committee to properly evaluate the Aquarium's role in multi-institutional research or work supported from multiple sources. Failure to fully disclose other funding sources is grounds for withdrawal of Aquarium sponsorship and project approval.

6.1 Funding duration

Funding is reviewed on an annual basis and approval of a three year budget is not a guarantee of support beyond the first year.

6.2 Legitimate expenses

Funding may be requested to cover legitimate research expenses such as personnel expenses (see Section 6.3), travel to field locations*, accommodations, bench fees, equipment purchase or rental costs, boat fees, consumables costs, software licenses, diagnostic testing costs, instrument time at service laboratories, *per diem* meals and incidental expenses, conference registration fees and publication costs. When budgeting for Meals and Incidental Expenses on field work, investigators should use the M&IE rates of the General Services Administration of the US Government, specific for the field location in question, available online at:

http://159.142.162.71/Portal/gsa/ep/contentView.do?contentId=17943&contentType=GSA_BASIC

Funding may not be requested for purchasing alcoholic beverages or entertainment expenses, nor for travel expenses of accompanying persons not participating in research or not identified in the research proposal. Travel insurance is the responsibility of each investigator's employer.

6.3 Matching funds

Matching funds are not a requirement for proposals submitted to the Research Committee, i.e. investigators can seek 100% of support from the Aquarium; but insofar as they demonstrate a truly collaborative partnership, they may be looked on very favourably and thus significantly enhance the chances of success. Matching funds may be real or in-kind, and should be outlined in the budget section of the proposal.

Real funds include the direct cost component of institutionally budgeted funds ("hard money") or extramural grant money ("soft money") aimed at the same project.

* Investigators should consult the chair of the Research Committee about the potential for air travel support from the Aquarium's corporate sponsor, AirTran, prior to budgeting for air fares.

In-kind funds include the value of investigator salary for time released to work on a project, and the value of asset time offered to a project, such as boat hours or instrument time. For salary, for example, 2 months of investigator time at an annual salary of \$50,000 is equal to \$8,333 of in-kind support. While a statement of time commitment is not required at the time of application, an analysis may be required as part of an audit. Over-commitment (commitment of more than 100% of salary) will be grounds for withdrawal of funding and project approval and may attract a ban on future proposals. Boat hours, instrument time or other in-kind contributions must be calculated on a realistic cost-recovery basis. For example, if it costs \$250/day to run a boat, you may not use more than \$250/day as matching funds.

6.4 Personnel expenses

Personnel expenses radically increase the total direct costs of a grant. When considering a request for salary support or student stipend, investigators should consider the limited research budget of the Aquarium, the restriction a salary request will put on other requested funds and the effects of these on the likelihood of a project's being approved. The Aquarium should not be considered a primary source for salary support, which always remains the principal responsibility of an outside investigator's institution.

6.4.1 Salary – Outside investigators may seek salary support from the Aquarium as part of a project proposal, with strict limitations. Barring certain exceptional circumstances, it is unlikely that the Aquarium will support 100% of a salary line. Typically, support would be limited to a maximum equivalent of 3 months annual salary, but as a real funds request (cf. *in-kind funds*), the investigator must demonstrate in the proposal submission process stage that they are able to commit that time to the project.

6.4.2 Fringe benefits – The Aquarium will generally honour the fringe benefits rates of institutions submitting proposals to the Aquarium. A statement of institutional fringe benefits policy should be submitted along with the application package for any proposal requesting salary support. Fringe benefits are included in direct costs.

6.4.3 Student stipends – The Aquarium will consider requests for stipends to support undergraduate or graduate student research assistants engaged in approved project research. These stipends are set at \$4,000 per semester (spring, summer or fall) for an undergraduate student, or \$23,000 annually for graduate student RA lines.

6.5 Indirect Costs

The amount of Indirect Costs (a.k.a. "Overhead") that may be requested is limited to the requesting investigators institutional rate, or 25% of the Direct Costs total, **whichever is lower**. For a proposal requesting \$10,000 direct costs, for example, the maximum indirect costs that may be accommodated is \$2,500. This rate scheme parallel's that of the National Sea Grant College system. For institutions that have two-tiered IDC rates for on-campus/off-campus research, investigators should provide an approximation of how much work will be done in each location and apply the different rates to the total direct costs in the appropriate proportion.

7.0 Publications Policy

Publications produced as a result of approved projects will become part of a numbered sequence of publications tracked at the Aquarium and held in its library. The Aquarium may pay for publication expenses on primary scientific literature (i.e. journal “page charges”); if these are anticipated, then they should be included in the proposal budget.

Investigators are asked to supply 100 reprints of any primary publication to the Aquarium; any costs for these may also be charged against the project budget. A PDF copy of the final manuscript file is also requested. Other publication types (e.g. books, Fact Sheets) should be discussed ahead of time with the chair of the Research Committee; in-house support of such activities may be possible through the Aquarium’s Graphics department.

The Research Committee reserves the right to review manuscripts as described in section 5.5.

8.0 Intellectual property

Outside investigators (or their institutions) retain intellectual property in research ideas and inventions derived from collaborative research with Aquarium staff *only* if they are principal investigators. When an Aquarium staff member serves as a principal investigator, intellectual property in the research transfers to the Aquarium, as with any work product.

9.0 Withdrawal

The Aquarium reserves the right to withdraw approval for collaborative research, including withdrawal of funding, in the event that the Research Committee feels that continuing to support the work fails to satisfy the research imperatives. In the event that funds have already been transferred to an outside institution, any residual funds must be returned to the aquarium and full account made of all funds expended to that point.