# CPACC Mid-term Review: 27 September – 1 October 1999

## INDICATORS OF PROJECT EXECUTION PERFORMANCE

- *The RPIU is functioning efficiently and is staffed with qualified professionals.*

Over the first two years of the project, the RPIU has accomplished a great deal. The establishment of the RPIU itself, the core of an effective regional organization, was found to be a considerably greater challenge than originally envisioned. The full establishment of the RPIU, forecast to take 60 days in the legal agreement, required nearly one year from project inception in April 1997 until the full complement of RPIU staff was on board in March 1998. In this startup phase, much of the time and effort of the Project Manager and the Information Systems Coordinator was directed toward establishing working relationships with the eleven NFPs and NICUs (St. Vincent and the Grenadines was incorporated into the project in July 1998), filling out the complement of RPIU staff, and integrating operations within the existing University structure. What appear to be substantial delays in the CPACC disbursement profile and in some project components to date can be more accurately attributed to the lengthy start-up. This is a major lesson learned: the establishment of an effective coordinating body within an existing institution for a complex regional project, such as CPACC, is a substantial task and should be treated as such in the design of similar regional projects. In the case of CPACC, the time and effort that was taken to "do the job right" has paid off. The RPIU's technical excellence, effective infrastructure for regional communications, and leadership on issues of climate change have become recognized throughout the region and the world, barely one year after it had been fully established.

Despite one recent change in senior staff, the RPIU is well positioned to manage and administer all the functions and responsibility assigned by the project over the next two years. The Deputy Project Manager, Dr. Floyd Homer, left his post when his contract expired at the end of June 1999. During his tenure, Dr. Homer initiated several activities to enhance the visibility of CPACC and climate change issues in the region, most notably, the Education and Public Awareness Program. Responsibility for these activities is now shared between an existing staff member and a new member, contracted to replace Dr. Homer, following a recommendation of the PAC meeting in July 1999. Leslie Walling, CPACC Coastal Zone Management Specialist, has been appointed Deputy Project Manager. Mr. Walling has been instrumental in initiating the Coastal Zone Inventories (Component 3) and the Coral Reef Monitoring Pilot Project (Component 5) and his technical expertise in these areas is a valuable asset of the RPIU.

Recognizing the importance of public awareness, the RPIU attracted Ms. Leisa Perch as Public Relations / Project Officer to fill in for and continue the activities of Dr. Homer. Ms. Perch will be the focal point for the CPACC Public Awareness and Education Campaign. In addition, she will take on some project management tasks so not to overload Mr. Walling with new duties as Deputy Project Manager, thereby freeing him to concentrate on leading two critical CPACC activities (C3 and C5).

The Executive Secretary, Ms. Bernice Walcott, also left the project early in 1999. Ms. Marquita Griffith assumed the duties of the CPACC Executive Secretary in May 1999.

Since all CPACC components will be underway within the next six months, project management tasks at the RPIU will increase considerably. During the mid-term review mission, it was agreed that the RPIU should seek short-term technical assistance to provide backstopping to RPIU staff with priority tasks,

including: logistics, project tracking, follow-up, and supervision of technical components. The RPIU should explore obtaining this support from UWI graduate students and/or consultants using funds allocated to technical components and pilot projects.

The RPIU recently moved its offices to the building that formerly housed the West Indian Commission. This newly refurbished building has been generously made available to CPACC by the Government of Barbados. Just off the UWI campus, it is a fully functional office complex and provides a working atmosphere very conducive to RPIU operations. Since the building is not directly connected to the University network, dial-up access to the system will be a necessary prerequisite for gaining access to the Banner system of the University Bursary. In a meeting with the Principal it was confirmed that such access will be available by October 13.

The RPIU Account Technician has expended considerable effort integrating CPACC accounts with the University accounting system. The project experienced several delays in processing payments to vendors by the Bursar's office and certain procurements had to be postponed. Account reconciliation reporting by the Bursar's office has also been excessively delayed. Moreover, the UWI accounting system does not allow separate reporting by project and does not provide the detail necessary for efficient project management.

These issues were the subject of an internal control review conducted by PriceWaterhouseCoopers in March 1999. The RPIU and the University Bursar jointly reviewed the recommendations of this review in April, and the university agreed to make several changes. The situation improved markedly after this meeting. RPIU staff were trained in using the university accounts system, accounts will now be reconciled monthly by the RPIU, and the processing time to pay invoices has been reduced significantly. However, the time required for UWI to enter and report RPIU expenditures is still unacceptably long and the RPIU still does not have direct access to the UWI system. Most of these outstanding issues will be resolved when the RPIU obtains direct access to the UWI accounts system.

- *The Project Advisory Committee (PAC) is providing policy guidance and reviewing implementation progress and project impact.*

During the 3rd PAC meeting in July 1999, the PAC conducted a comprehensive review of: RPIU staffing and facilities; progress on technical components; NICU operations and; CPACC institutionalization. Highlights of the PAC's policy guidance are presented below.

**Component 1:** the question of ownership of the sea level and climate monitoring stations needs to be clarified.

**Component 2:** there is a need to enable e-mail and internet access by all CPACC contact points.

**Component 3:** the RPIU should ensure this activity is realistically designed to provide inputs for other components and that skilled personnel are available for effective project execution; CPACC should attempt to meet the high demand for GIS training in the region; CPACC should coordinate with the GIS capacity building project of FAO in the OECS countries.

**Component 4:** this effort should develop an integrated process for ICZM and should not be limited to legal and regulatory dimensions; linkages to ongoing development activities will be essential.

**Component 6:** there is a great deal of interest in vulnerability and adaptation assessments in the region, especially since member countries must report on V&A in National Communications; CPACC should consider options to build V&A capacity in all participating countries.

**NICUs:** quarterly reporting is a burden that could be substantially reduced if done through the CPACC

web site; some effort should be made by the RPIU to improve communications about all project events; CPACC should consider ways to increase commitment to the project by participating agencies, perhaps by providing computer equipment or other tangible benefits; ownership of CPACC equipment should be clarified.

**CPACC institutionalization:** the proposed climate change center should now be articulated more clearly and this should be done by establishing a Technical Committee with this as its mandate; the Finance and Sustainability work group should be operationalized to address CPACC's long-term financial sustainability; the RPIU should liaise and coordinate activities with FAO's regional climate change program, the CCA, the UNDP GEF Enabling Activities Project, and UNESCO (for public awareness and education initiatives).

- *Quarterly activity and semiannual progress reports are prepared in a timely and satisfactory manner.*

Progress reports are timely and satisfactory.

- *Quarterly disbursement plans and annual financial reports are prepared in a timely and satisfactory manner.*

Planning and reporting are satisfactory.

- *Performance targets are achieved as specified in the Annual Operating Plan.*

Some performance targets have not been met due to cash flow bottlenecks between the World Bank, the OAS, and the RPIU. Actions that address this issue are specified below and in the main body of this Aid-memoire.

- *Deviations from the annual operating plan are corrected promptly and appropriately.*

The OAS and the RPIU have displayed remarkable initiative in re-designing project components as needed. For example, the initial design of the Inventory of Coastal Resources and Use, Component 3, has been problematic since inception. The RPIU issued an RfP and selected a consulting team drawn mostly from the Caribbean region that is now implementing a comprehensive Coastal Zone Inventory (CZI) exercise to be completed in June 2000. While this re-designed effort is well behind the original schedule (due to the lengthy CPACC start-up), due care was taken to ensure that this delay will not adversely impact the implementation of the pilot projects that rely on CZI outputs.

- *Disbursements are made on a timely basis and procurement is carried out according to Bank guidelines.*

Disbursements for project activities have been problematic and have led to implementation delays. As all project components get underway over the next six months, the level of expenditures is expected to increase. In addition, the frequency of disbursements may need to be stepped up to accommodate increased activity levels in quarterly workplans. As such, the level of project advance disbursements from the World Bank to the OAS needs to be raised. To accomplish this, the mid-term review recommends that the level of the authorized amount at the GS/OAS should be raised to at least $800,000 (projected disbursement for the next six months), $300,000 more than agreed in the legal agreement.

Procurement and contracting has been carried out according to GS/OAS procedures, which are consistent with Bank guidelines.

As the university is a tax-free entity, it pays value-added taxes on expenditures for equipment and then receives a refund from the Government of Barbados. As such, expenditures for RPIU equipment are also taxed and the university is liable to refund these taxes to CPACC. A procedure for obtaining tax reimbursement should be established over the next six months.

- *Audit reports and other reviews show sound financial practices.*

The 1998 annual audit conducted by Ernst & Young showed that sound financial practices are employed. This audit and the internal control review recommended that accounting practices and responsibilities in the RPIU be clarified and formalized by drafting an accounting practices manual. The RPIU will follow up on this recommendation and will evaluate accounting software packages that may simplify project administration by tracking and reporting project expenditures according to UWI and World Bank classifications. CPACC should also obtain a copy of the UWI audit, completed in July 1999, and provide a copy to OAS and the World Bank.

The World Bank has committed to participating in the 1999 CPACC audit.

On the issue of Year 2000 compliance, the Information Systems Coordinator has reviewed hardware and software for equipment bought by the project. According to his review, the Y2K problems on the computer systems provided and installed by CPACC can be addressed using generic and accessible software solutions.

- *Indicators of Project Execution Performance: NICUs.*

The mid-term review recognizes that effective execution of the CPACC project depends on the performance of NICUs. Independent evaluations of NICU operations were prepared for the mid-term review by Mr. Cletus Springer and Mr. Rashleigh Jackson. A summary of recommendations are presented under "Indicators of Project Impact" in this Annex. The mid-term review requested that Mr. Springer prepare a synthesis of these reports, evaluating NFP and NICU performance according to a proposed set of criteria below. This evaluation is intended to serve as a management tool, helping the RPIU to identify where improvements can be made, and to target the allocation of their resources. The results of this rapid assessment will therefore not be distributed beyond those involved in CPACC management. The report will be due by October 30, 1999.

The following set of criteria is proposed for each participating country, and it is suggested that nominal rankings (High, Medium, and Low; or Effective, Not Effective) are applied.

**1. National Focal Points (NFP):**

1.1 Capacity to coordinate inter-institutional efforts.
1.2 Capacity to plan and implement project activities.
1.3 Quality/timeliness of reporting to RPIU.
1.4 Access to information; ability to connect to Internet.
1.5 Effective access to country political leadership.
1.6 Effectiveness in communicating with Media.

**2. National Implementation Coordination Units (NICU):**

2.1 Degree of participation of NICU institutions in project activities.
2.2 Frequency of NICU meetings.
2.3 Capacity to integrate CC in the development agenda of the country.
2.4 Capacity to introduce CC in the national dialogue.
2.5 Capacity to mobilize interest and support in civil society/private sector.

**3. Country Ownership**

3.1 Political support for CC issues.
3.2 Institutional support for NFP: providing necessary time and resources to NFP for fulfilling his/her duties.
3.3 Degree of integration of CPACC activities in the participating NICU institutions: dedication of budget, allocation of staff time.
3.4 Existence of related bodies that can reinforce the work of the NICU (SDC, CC Committee, etc.).

## IMPLEMENTATION STATUS BY COMPONENT

Due to a lengthy project start-up, schedules for all CPACC components have been revised and are included as a separate annex to this Aide-memoire.

### COMPONENT 1: SEA LEVEL/CLIMATE MONITORING NETWORK (REGIONAL)

*Objective: To strengthen the regional capacity for monitoring and analyzing climate and sea level dynamics and trends, seeking to determine the immediate and potential impacts of global climate change (GCC).*

**This component has been implemented with a high degree of professionalism and was delivered ahead of schedule, as a result of the efforts of the Acting Regional Network Coordinator and the staff of the CIMH. All monitoring stations are now installed and generating data. The successful installation of 18 multi-sensor gauges in 12 countries over a one year period is an unprecedented achievement. Two detailed evaluations, commissioned for the mid-term review, identify several outstanding issues to be dealt with in the coming months.**

- Site selection, station configuration and installation.

All 18 monitoring stations were installed on schedule and are now operating.

- Fix geocentric benchmarks.

The first campaign to fix a Continuously Operating Reference System (CORS) in Barbados and Global Positioning System (GPS) benchmarks in each participating country was completed concurrently with station installations. A second CORS was recently installed at the Manley International Airport in Kingston, Jamaica. The second campaign to check GPS locations will be conducted in the year 2000.

- Operation, maintenance & calibration.

The term of the Acting Regional Network Coordinator (RNC), Mr. Lee Chapin, formally ended in June 1999. All system design, installation and training was conducted under his leadership. The RNC duties were scheduled to be transferred at that time to Mr. Ronald Leslie (operations and maintenance) and Mr. Frank Farnum (administration and management) of the Caribbean Institute of Meteorology and Hydrology (CIMH). Mr. Leslie seems well prepared to assume the RNC duties, is an interested and enthusiastic partner, and will be key to the operational success of the network. Mr. Chapin has been retained as an advisor, as needed, until the transition is complete.

CIMH will be responsible for data quality monitoring (for meteorological data), system calibration and maintenance, and production and dissemination of meteorological products. CIMH is now implementing a rotational program for calibration, long term maintenance and replacement of components in the network. Costs of replacement parts, manufacturer repairs and shipping are to be covered by Sea Level and Climate Monitoring Station Maintenance and Replacement Fund to be established at CIMH. During the last supervision mission it was noted that an agreement between the GS/OAS and CIMH for the establishment of this Trust Fund was to be forwarded to the World Bank for approval by April 1999, but this is yet to be received. The mid-term review learned that final arrangements for this mechanism have been completed at CIMH and the agreement will be forward to the World Bank shortly.

A recent survey of national counterparts for Component 1 indicates that routine maintenance is, in all cases, performed by the National Meteorological Service. However, most do not have an effective program to maintain or replace stations if they are damaged or destroyed and none of the stations are insured. Ownership of the monitoring stations, responsibilities for maintenance and repairs and the role of the Trust Fund will be formally clarified by the RPIU and will be reflected in the Trust Fund agreement and updated MOU's between the CIMH and each country.

- Data acquisition and archiving system.

Data is now being downloaded and archived at several locations outside of the Caribbean and is available on a web site (linked to the CPACC web site) maintained by Vitel, Inc. in Virginia. To build capacity in the region, CPACC is considering moving the GOES downlink ground station to the Institute of Marine Affairs (IMA) in Trinidad and Tobago. This option is acceptable to both CIMH and IMA – CIMH has agreed to process and analyze meteorological data and IMA has agreed to produce and disseminate oceanographic products. IMA has expressed a keen interest in hosting the GOES ground station and archiving and analyzing data from the monitoring stations. IMA has shown considerable initiative by developing a web site and producing oceanographic applications from data now obtained from the Vitel web site. Moreover, the IMA recently installed a high-speed dedicated internet line suitable for a web server. Several issues must be resolved, however, before CPACC commits to moving the GOES ground station from Vitel to IMA. Chief among these, a new IMA director must be appointed and commit to hosting the downlink ground station, making the data available through a web server and maintaining the internet line. It is expected that outstanding issues with this arrangement will be resolved and the ground station will be transferred to the region early in the year 2000.

The evaluation of national institutions participating in Component 1 indicates that after one year of operation, most countries are not using the data being collected by the stations. This situation is not altogether abnormal since much of the first year of operation was dedicated to system de-bugging. However, if this situation is not improved, it would have major implications for the sustainability of the sea level and climate monitoring network. The overall consensus of national participants is that they would like to have better access to the data. While the format of the data available on the internet has been improved during 1999, the perception remains that it is still not easy to download requested data from the Vitel web site. Another factor which may have contributed to this situation is the lack of real-time data display. The project is now addressing this by examining the feasibility of installing transmitters to broadcast multi-sensor readings via a voice channel on a marine frequency and through a telephone connection. Work is also progressing with the US National Weather Service to place the data on the STAR-4 satellite data system which is used throughout the Caribbean by the Meteorological Services, on a routine basis. An improved web interface (in conjunction with moving this function into the region), adding real-time voice broadcast capability to all stations, and inclusion of data in the STAR-4 system would each enhance the dissemination and use of the data. This would, in turn, serve to ensure that the monitoring stations installed by CPACC will be maintained and continue to generate critical information for research and other applications well after the CPACC project ends.

The option of real-time voice broadcast presents an opportunity for generating income from sea level and climate monitoring station data. Numerous private and public enterprises, including mining and manufacturing companies, shipping, ports, hotels and tourism would find instantaneous tidal and meteorological data useful for their operations. CPACC will explore the potential for raising funds through annual subscriptions to parties interested in receiving voice transmissions of instantaneous sea level and weather data. The cost of one transmitter is roughly $3,500. An effective marketing strategy for securing

private sector subscriptions will probably employ a provision point mechanism – a minimum number of subscriptions must be pledged as a condition of providing the service. Provision point mechanisms have been used in several instances where the good to be provided has substantial public good properties and give rise to free-rider problems (such as recreational facilities, parks, and radio broadcasts). CPACC will develop a marketing strategy shortly and will attempt to implement it during visits to each country in the year 2000. If successful, this effort would constitute another innovative achievement of CPACC.

## COMPONENT 2: DATA BASES AND INFORMATION SYSTEMS (REGIONAL)

*Objective: To establish databases and information systems allowing key regional and national institutions to acquire, analyze, store and disseminate data on climate change and its impact on natural and man-made systems.*

**The Information Systems Coordinator has kept this component on schedule while supporting development of other CPACC components, delivering training, and building GIS and internet capabilities throughout the region.**

- Assessment of current conditions and needs.

Mr. Ian King, the Information Systems Coordinator (ISC), convened a meeting of GIS experts from all CPACC countries in February 1999. Participants reviewed the ISC's assessment of GIS capabilities in each country and identified most effective approaches to build and support GIS capacity. The meeting considered in detail the needs and requirements of agencies that will act as repositories for spatial databases generated by CPACC Component 3, Coastal Resource Inventories. Participants issued several recommendations that contributed substantially to the design of the resource inventory activity.

- System design.

The CPACC web site has been greatly improved as a tool for project communications in 1999. In the past, the RPIU has retained students to adapt and update the web site. Additionally, external assistance has been contracted to catalogue documents generated and collected by the project.

Though the web site is greatly improved and is easy to use, there is an open question of how effective the web site currently is as a tool for information and education about the project and for communication with NICUs. Due diligence will be required throughout the next two years to ensure the page is kept up to date. Moreover, as the effectiveness of any web site is a dual function of its usefulness in finding information and in being found by others searching for information, the CPACC webmaster should ensure that the page contains links to major climate change sites and that it shows up as a link on pages of the World Bank, the Climate Institute, etc. The demands of maintaining the CPACC web site will increase as the project enters a very active phase over the next year. As such, the Information Systems Coordinator may wish to explore options for contracting out many if not all of the Webmaster tasks.

The other major function of the web site, a medium for disseminating data from the monitoring stations, is currently unsatisfactory. As this data is one of the key outputs of CPACC, every effort should be extended to improve the ease of use and consistency of the web site data interface. This should occur with the transfer of the download station from Vitel to the Caribbean. IMA has designed a web page for dissemination of sea level and sea surface temperature data summaries and it is expected to be launched on

October 27, 1999.

- System procurement.

The evaluation of national institutions participating in Component 1 identified several National Focal Points that did not have a computer and, as such, were not able to participate in web and e-mail communications with the RPIU. Additionally, there is a need to provide computers to CPACC lead agencies that do not have a computer for the same reasons and also to facilitate their participation in the technology transfer process. CPACC realized some savings in the initial procurement of computer equipment and plans to use these savings to provide additional computers in these situations. Conditions for use should be specified and clarified through NFPs for all computers provided under these circumstances.

- Training program.

Much of the computer training that will take place under CPACC over the next six months will be in the form of on-the-job training to be conducted by consultants implementing Component 3 as national agency staff collect and enter data for their coastal resource inventories. This approach was identified as promising during the GIS experts meeting in February 1999. This will be complemented by three formal training workshops over the period September 1999 to June 2000.

More generally, CPACC's focus on GIS as a tool for resource planning has generated a number of associated activities that are developing GIS and internet capabilities throughout the region. CPACC has provided equipment for a GIS laboratory housed in the Center for Resource Management and Environmental Studies (CERMES) on the UWI Cave Hill campus in Barbados. CPACC has been requested to provide national level training in GIS methods to professionals in Antigua & Barbuda and in Guyana. UWI is offering a certificate course in Geographic and Land Information Systems (CGLIS) utilizing CPACC expertise and equipment provided by CPACC in the CERMES laboratory.

CPACC expertise in this area has also been recognized by SIDSnet, a UNDP program that has experienced difficulties in meeting one of its objectives: to develop electronic communications capacity in the region. CPACC signed a MOU with SIDSnet to coordinate 10 national workshops on internet use and information management. UNDP will cover all costs and has provided an assistant to the RPIU to administer the workshops.

- System implementation, maintenance and upgrading.

A UWI student was retained to review, update and upgrade the CPACC web site. In addition, a documentation specialist was contracted to establish the CPACC RPIU Documentation Center. The RPIU has initiated a series of RPIU bulletins that appears to be an effective medium for increasing RPIU visibility and informing CPACC participants and the public at large of recent and upcoming events. The ISC has also created several chat rooms / list-serve facilities to provide forums for discussions on CPACC technical components. Judging from the activity in some of these (most notably for the coral reef monitoring program) this service has been a great success. The ISC should consider linking these discussions to the CPACC web site.

**COMPONENT 3: INVENTORY OF COASTAL RESOURCES AND USE (REGIONAL)**

*Objective: To further develop each participating country's inventory of coastal resources so as to provide the necessary baseline data for the execution of other project activities.*

**This critical path CPACC activity is significantly behind the original schedule largely due to the delay suffered in contracting the CZM Specialist at the RPIU. This delay notwithstanding, the workplan has been thoroughly revised, is technically sound and is now being implemented by a team of competent professionals. Moreover, data required as inputs to CPACC pilot projects will be collected early in the process to minimize cumulative delays.**

- GIS installation and upgrade.

All equipment that CPACC agreed to provide to CERMES for their Geospatial Laboratory is in place. Provision to national institutions will occur soon, according to Component 3 and pilot project plans.

- Coastal inventory design and implementation.

Originally scheduled to begin in the summer of 1997, implementation of the Inventory of Coastal Resources began in July 1999. This severe delay is due to the lengthy project start-up (the Coastal Zone Management (CZM) Specialist, Mr. Leslie Walling, came on board in March 1998) and a longer contracting period than originally planned to follow international competitive bidding procedures). The RPIU developed and issued an RfP for this activity in December 1998. In the process of developing the RfP and working with the team that was awarded the contract, this activity has been thoroughly revised and fleshed out. A team of consultants from Alleyne Planning Associates, Inc. of Barbados and ESSA Technologies Ltd. of Canada was selected to implement this activity.

The Inventory of Coastal Resources and Use is to be conducted in three phases: 1) information assessment, cataloguing and database design; 2) coastal resource data collection and digitization; and 3) preparation of spatially referenced coastal resource inventories. Most of the work in Phase 1 is being conducted by the consultants and the CZM Specialist in-house at the RPIU in conjunction with NFPs and Lead Agencies responsible for at least 2 critical path activities. New data to be collected for the CPACC pilot projects (components 5-8) should be ready early in the year 2000. Training is to be conducted on-the-job at each stage in this process and will be complemented by three workshops. All outputs of the inventory should be completed by the end of June 2000.

Phase 1, Data Assessment, should be completed in December 1999. Gaps in existing information that will be needed for the pilot projects will be identified by the end of October 1999. In November 1999, additional data needs for pilot projects will be reviewed with NFPs and members of NICUs in each country and methods and responsibilities for collecting this information most efficiently will be determined. It is envisioned that new data to be collected for each pilot project, under Phase 2, should generally require no more than two months. As such, primary information to support the pilot projects: Coral Reef Monitoring; Vulnerability Assessment; Economic Valuation; and Formulation of Policy Proposals, should be identified and collected early in the year 2000.

All parties to the mid-term review, the RPIU, the GS/OAS and the World Bank, recognize that this schedule is very ambitious not only because of the broad scope of additional information that will be required for the pilot projects, but also since methods and responsibilities for collecting additional data will

need to be developed and agreed to in twelve countries. With this in mind, it is imperative that the GS/OAS and the RPIU place a very high priority on supporting this work and rapidly address any problems that might delay outputs.

- Training (to be completed on-the-job as an integral part of the work).

National counterpart agency staff will receive on-the-job training throughout this activity. Training in metadata cataloguing techniques has been completed. Further training will take place during phase 2, much of which is to be implemented by national counterpart staff in each country. It is expected that training in GIS and data management methods will be closely coordinated with the Information Systems Coordinator.

**COMPONENT 4: FORMULATION OF A POLICY FRAMEWORK FOR INTEGRATED COASTAL AND MARINE MANAGEMENT (REGIONAL)**

*Objective: To develop a generic policy framework for the preparation of Integrated Coastal Zone Management (ICZM) legislation throughout the region which would incorporate mechanisms for planning for the adaptation to climate change, such as land use guidelines and disaster contingency planning.*

**This component is on schedule.**

- Evaluate existing approaches, policy frameworks and legislation relating to Integrated Coastal Zone Management.

- Assist countries in identifying and formulating policy elements and programs that address adaptation to global climate change as part of their ongoing coastal zone management efforts.

Since there is a great deal of ICZM activity in the Caribbean, CPACC will not be starting from scratch. There is also a great deal of interest – the project has received at least ten inquiries from firms and individuals interested in working on this component.

As ICZM initiatives cut across several sectors and jurisdictions, this activity will commence with a comparative evaluation of ICZM effectiveness under different institutional arrangements. Recognizing that the formulation of effective ICZM programs is often a long and involved process, the third PAC meeting in July 1999 stressed that this component should not only concentrate on regulations and legislation, but also focus on transparent process that effectively involves all stakeholders.

An implementation plan has been drafted, TORs have been drafted and the RfP will be issued shortly. The mid-term review emphasized that this component may need to be accelerated. As such, every effort should be made to issue the RfP as soon as possible.

**COMPONENT 5: CORAL REEF MONITORING FOR CLIMATE CHANGE (PILOT: THE BAHAMAS, BELIZE, JAMAICA)**

*Objective: Building upon ongoing coral reef monitoring throughout the region, to establish a long-term*

*monitoring program in the Bahamas, Belize, and Jamaica, which over time would show the effects of global warming factors (temperature stress, sea level rise, and hurricanes) on coral reefs.*

**A consensus emerged from an active (and sometimes heated) debate by the participating countries on coral reef site selection and monitoring methodology. Outstanding institutional and methodological issues remain in the area of data analysis. Ongoing discussions of these issues delayed field measurements which were to begin in March 1999. However, all equipment and training is in place and the first actual transit measurements should be completed by the end of this year. A detailed evaluation of this pilot project was prepared for the mid-term review.**

- Site selection and methodology.

Activities under this component are extensions of an existing CARICOM monitoring effort that has been underway for ten years. Active consideration of site selection and monitoring methodologies appeared to be complete in March 1999 when institutional arrangements for the monitoring program were drafted, discussed, and accepted by all parties. However, there is still some discussion as summarized below.

- Monitoring methodology and data analysis.

All monitoring equipment has been procured and is in place. An intensive training workshop was held in March 1999 in which all aspects of the effort were discussed. An active debate on appropriate methods for monitoring and analysis ensued. The RPIU ISC established a list-serve to facilitate communication between the RPIU, participating countries, and interested institutions. The list-serve provided a major forum for this discussion. Another detailed monitoring workshop was held in May 1999. The process then stalled due, in part, to the continuing methodological controversy and, in part, to a delay in delivery of the underwater video cameras.

Mr. Leslie Walling, the Coastal Zone Management Specialist, maintains a close and relatively informal liaison with participants in Component 5 and has played an active role in technical discussions since project inception. A strong level of goodwill and mutual respect has been developed between all participants. Clearly all participating institutions are invested in and committed to this activity.

Arrangements and procedures for all post-fieldwork activities (coral counting and analysis) are still poorly understood by all participants and require substantial clarification by the RPIU, namely by Mr. Walling, in consultation with host countries. As participants recognize Mr. Walling's expertise and respect his leadership on these issues, he can clearly be very effective if allowed to dedicate considerable energy to this component. This has given rise to concerns, noted in the evaluation report, with Mr. Walling's availability in light of his new duties as Deputy Project Manager. This has been recognized by the RPIU and some of Mr. Walling's DPM duties have been shared with Ms. Leisa Perch.

The search for consensus on site selection, monitoring and analysis has certainly been a healthy approach. However, the search for consensus served to delay the start of monitoring which was slated to begin in March 1999. Even though some issues still remain to be worked out, monitoring is expected to begin during the second annual survey window September through November 1999. It is important to begin the measurements now to build some momentum through actual implementation.

At this point, plans are to monitor reefs twice yearly at three sites in each country and 20 transects per site. This is an expensive proposition in time and money. It may be possible to simplify monitoring

requirements significantly (once yearly, at fewer sites, or fewer transects per site) but still develop an accurate record of reef health over the long term, which is the ultimate objective of the exercise. The monitoring program can only be optimized after some initial readings are obtained and analyzed. For example, it would be impossible to determine the minimum number of transects that cover a high percentage of species without actual readings.

In line with these considerations, CPACC is examining low cost options for continuous remote monitoring of water quality and physical parameters which would enhance the ability of the project to identify inter-annual variables that impact the reefs. Continuous remote monitoring could provide continuity to the data, increase the efficiency of data acquisition and enhance the quality of data interpretation. These benefits could be achieved despite the reduction in the initially planned frequency of monitoring visits and would also address capacity deficits in the pilot countries for water and physical parameter monitoring.

The Bahamas are now in the process of site selection and there is a need for either Mr. Walling or a consultant to visit to get the monitoring underway. Monitoring is now taking place in Belize. Monitoring of at least one site in Jamaica, Discovery Bay Marine Biology Station, is also planned. With this, the chances are good that a first monitoring will be complete in each country by the end of this year.

The evaluation report also emphasizes the following issue that highlights the importance building momentum on this component. "Unless existing country participants can see direct benefits in relation to their own coastal and marine resources management programs, continuity will be difficult to justify at a national level. If national agencies are simply acting as data gatherers from which third-parties will benefit, their enthusiasm for continuing to contribute to CPACC related activities may diminish."

**COMPONENT 6: COASTAL VULNERABILITY AND RISK ASSESSMENT (PILOT: BARBADOS, GRENADA, GUYANA)**

*Objective: To develop pilot coastal vulnerability and risk assessments in Barbados, Grenada, and Guyana.*

**This component has generated broad interest within most CPACC countries and is being implemented on schedule.**

- Evaluate models and techniques for vulnerability analysis and risk assessment and adaptation of the IPCC common methodology for application to Caribbean region.

A first sub-regional workshop to discuss methodologies for vulnerability assessments was held in Grenada March 29-31, 1999. Teams from participating agencies began preparing Rapid Vulnerability Assessments (Screening Assessments) in January 1999 and presented results at the workshop. A review of existing methods for vulnerability assessment was presented and participants agreed to a plan of action for implementing this project during the workshop. Participants also requested that CPACC provide consultants in country to coordinate the next steps in the process. Consultants have been retained in each country and are now working with NFPs and NICUs to assess existing data, identify pilot project sites and clarify what additional information will need to be collected under the Coastal Zone Inventories, Component 3. Vulnerability assessments (that include assessments of impacts from various scenarios for sea level rise) are expected by August 2000. Draft adaptation strategy reports will be due at the same time and a regional report will be prepared in early 2001.

Most CPACC countries are very interested in this coastal vulnerability and risk assessment work since this constitutes a substantial part of the country's Initial National Communication to the UNFCCC. At different instances, it has been recognized that there is a need broaden the scope of the coastal vulnerability assessment to assess vulnerability of the agriculture and water sectors. This additional work will make a key contribution to understanding in the region since existing methodologies for vulnerability assessment in agriculture are generally not applicable to tropical countries. CPACC is considering options for securing additional resources to accomplish this objective.

**COMPONENT 7: ECONOMIC VALUATION OF COASTAL AND MARINE RESOURCES (PILOT: DOMINICA, ST. LUCIA, TRINIDAD AND TOBAGO)**

*Objective: To design and implement pilot studies in Dominica, St. Lucia, and Trinidad and Tobago to estimate market and non-market values of resources in selected coastal ecosystems at risk from sea-level rise.*

**This component is on schedule.**

- Methodology definition.

Terms of reference for the initial phase of the implementation of this component have been finalized and consultants are under contract. A critical review of relevant existing methodologies for economic valuation is due shortly. In addition, a strategy for component implementation is now being drafted.

A workshop for participating countries will be held in December 1999. At this workshop, participants will be trained on the economic valuation of natural resources and will agree on case studies to be implemented in their countries.

Many of the countries participating in Components 7 and 8 have expressed a desire to join the activities under these components. While it may be effective to hold joint workshops, it should be noted that methods of economic valuation are conceptually very different from policy analysis and the evaluation of economic instruments and regulations. The RPIU and GS/OAS should coordinate closely with consultants responsible for these two activities to determine if merging any activities of these components would be helpful.

**COMPONENT 8: FORMULATION OF ECONOMIC/REGULATORY PROPOSALS (PILOT: ANTIGUA AND BARBUDA AND ST. KITTS AND NEVIS)**

*Objective: To implement two pilot studies in Antigua and Barbuda and St. Kitts and Nevis to demonstrate the design and use of economic and regulatory approaches to environmental protection in response to threats from sea-level rise.*

**This component is on schedule.**

- Methodology definition.

Terms of reference for the preliminary activities under this component have been finalized and are being

discussed with consultants. The initial activity involves a comprehensive review of the use of economic instruments in the region and the identification of opportunities for introducing economic instruments in the policy framework of the two pilot countries. There is an open question as to whether or not this activity could be productively extended to additional CPACC countries with larger and more complex regulatory structures. This question should be addressed in the initial consultant's report that is due in January 2000.

**COMPONENT 9: GREENHOUSE GASES INVENTORY / AGRICULTURE AND FRESH WATER RESOURCES VULNERABILITY ASSESSMENT**

*Objectives: This component is designed to i) enable St. Vincent and the Grenadines to prepare its initial national communication to the United Nations Framework Convention on Climate Change (UNFCCC) and ii) facilitate its full participation in CPACC.*

**This component fell behind scheduled due to complications with the technical implementation of the GHG inventory. The inventory is now complete and the final report is being drafted.**

Since St. Vincent and the Grenadines is the first country in the region to go through this exercise, information required by the IPCC GHG inventory guidelines had to be adapted to local conditions. This required a major effort on the part of local consultants and the GS/OAS. Special consideration had to be given to data collection, analysis and reporting for all sectors: energy; industry and construction; agriculture; and waste.

The National Focal Point, Dr. Reynold Murray, has been a major force behind this effort. A former High School teacher, he initiated several innovative activities to raise public awareness of climate change issues and to build political support for bringing this activity to St. Vincent and the Grenadines. For example, Dr. Murray proposed that students write on "the impact of sea level rise on St. Vincent and the Grenadines" as the subject for an annual essay competition. The resulting public response served to raise issues of climate change in this country to levels that may not have been attained by even an well-financed public relations campaign. During implementation, he participated in the Central American workshop on GHG inventory and mitigation held in Guatemala, March 1-5, 1999. Although the workshop was designed specifically for Central American countries, Dr. Murray received training and information on the national communications report to the UNFCCC and GHG inventories and was able to discuss progress on his country's study with international experts. In addition, a participant in this effort also presented an update of the work on the GHG inventory at the first Caribbean "thematic workshop" sponsored by the UNDP/GEF project in Barbados, April 19-21, 1999.

All data gathering and analysis has been completed and the final report is being written. The national communication should be ready by the end of 1999.

## INDICATORS OF PROJECT IMPACT

The Mid-term Review conducted the first assessment of CPACC project impacts. It is recognized that these indicators are measures of the ultimate project objectives and few will have been achieved by the mid-point of the project.

### *Indicators of improved knowledge*

(a) Systematic data observation, monitoring and collection, according to published guidelines, are effectively done.
(b) Regular reviews are made of the adequacy of the technical models, policy frameworks, and data sets used, and appropriate procedures are adopted for improving model design and data collection.
(c) An agreement is reached among participating countries on standards for regional archiving, access, and reporting formats.
(d) Useful project information and data are included in global databases.
(e) The technical soundness and validity of technical models and data used are confirmed in independent reviews.

The installation of 18 sea level and climate monitoring stations in 12 countries within the first year of the project is a striking accomplishment under Component 1. This accomplishment is even more impressive when considering that the installations are now capably maintained by national meteorological services and data is now routinely collected, included in the GLOSS database, and made available through the CPACC web site. Under Component 5, existing methods for monitoring the health of coral reefs have been improved substantially. The state-of-the-art protocols and methodologies that were developed for the CPACC coral reef monitoring program have been published on the CPACC web site and constitute a contribution to international scientific understanding in this area. In a similar fashion, the methodology developed and adopted for assessing the vulnerability of coastal areas under Component 6 is innovative and, thereby, contributes to international scientific knowledge. In addition, the metadata standard for reporting coastal zone resource inventory information, developed under Component 3, contributes to knowledge in that it provides a comprehensive foundation for the management of coastal resource information.

### *Indicators of capacity-building*

(a) Climate change considerations and adaptation strategies are appropriately disseminated and proposed for national institutionalization.
(b) Technical studies, models, and data are used in regional and national environmental decision-making.
(c) The legal, regulatory, and economic framework for integrated coastal zone management and adaptation planning are reviewed and proposed for adoption.
(d) Researchers, policy-makers, and other stakeholders are able to access all relevant technical information, methodologies, and data in a useful format.
(e) Technical training courses and workshops are successfully completed by appropriate staff of collaborating institutions.

Over the first two years of the CPACC project, the RPIU has developed a technical capacity for addressing climate change issues that has been recognized throughout the region and, in fact, the world. Moreover, as

CPACC enters its second half, the RPIU will continue to develop expertise with assessment of coastal vulnerability, economic valuation of resources, and adaptation strategies and policies. Reports and data generated by the project are available freely over the CPACC web site and RPIU staff have made presentations at several regional and international meetings. This outreach has served to raise the profile of climate change issues in participating countries and in the region as a whole. This expertise is gradually being translated into substantial capacity improvements at the national level. Because of CPACC, the technical preparedness of the region's representation in international discussions toward the UNFCCC has been markedly improved. While the Caribbean representation is still not fully fluent with all issues, the gap in knowledge has been reduced as a direct result of CPACC.

While CPACC activities have raised the profile of climate change issues in the region, it was observed that the environment barely figures on the policy agenda of most Caribbean countries, much less climate change. Given this, CPACC capacity building and public awareness efforts (reviewed below) are rightly aimed at the national partners in each participating country. But CPACC may have as much, if not more, impact by supporting a regional initiative to frame a coherent policy position on climate change issues for the Caribbean. Such a clarified policy position could only strengthen the hand of the Caribbean (and other small island developing states) in ongoing international discussions on the Climate Change Convention.

*Climate change in the Caribbean region*

CPACC should consider providing the impetus and technical support for an explicit effort within CARICOM to develop a coherent regional policy position on climate change issues. An effective effort to support a regional dialogue would complement ongoing CPACC efforts to build capacity and public awareness at the national level. Simultaneous efforts to raise the quality of climate change research and policy at both the regional and national levels can be seen as "two legs" on which CPACC can most effectively stand. CPACC has already made substantial strides on both legs, but has quite a distance to go. Future supervision missions should include "support for regional climate change initiatives" as an indicator of project impact.

The CPACC RPIU has evolved into a regional clearinghouse for exchange and coordination of climate change activities in the Caribbean. This role has served as a catalyst to attract a great deal of attention to climate change issues and has raised CPACC's visibility. Through this role, CPACC has also brought professionals from various backgrounds and institutional affiliations into contact, thereby enhancing the quality of climate change work in the region. Discussions between the RPIU, the Government of Canada and UWI are now underway to establish an expert group to enhance existing climate change modeling work in the region.

CPACC's technical achievements, particularly those from Components 1, 5, and 6 have also served to raise the visibility of climate change issues within the OAS and CARICOM. The twenty-ninth General Assembly of the OAS adopted a resolution to instruct the Inter-American Council for Integral Development to propose ways and means to address Climate Change in the Americas within the OAS. In October 1998, the RPIU Project Manager introduced climate change issues into political discourse at the ministerial level through a presentation at a meeting of the CARICOM Council of Ministers for Trade and Economic Development (COTED), which is responsible for environmental issues. This was a key first step in CPACC's efforts to raise awareness of climate change issues in this regional body. It is hoped that continued efforts along these lines will stimulate member states to participate in the dialogue and, thereby, frame broad support for a regional initiative on climate change.

*Capacity-building at the national level*

As mentioned above, climate change issues have generally not become part of the main-stream policy dialogue at the national level. A major thrust of CPACC has been and continues to be in the form of hands-on training and workshops designed to build capacity in collaborating institutions. Through the training under each CPACC component, professionals have been sensitized and their understanding of climate change issues in the region has been enhanced. During the second half of the CPACC project, it is hoped that CPACC efforts to raise public awareness at the national level through the Education and Public Awareness Program will build political support.

Early in 1999, a Jamaican firm was contracted to design an Education and Public Awareness Program for CPACC. The objective of this activity is to raise public awareness of the serious risks that climate change poses to Caribbean ecosystems and economies and what can be done in the face of these risks. Heightened public awareness would encourage governments to formulate national adaptation strategies and would influence environmental decision-making and policy.

Several formal courses of study will be available through the UWI system due to support from CPACC. UWI is reformulating its environmental masters degree program in the academic year 2001. Recognizing the RPIU's expertise in climate change issues, a specialization in climate change within this masters program will be offered on the Cave Hill campus. The GIS certificate course in Geographic and Land Information Systems was made possible by the provision by CPACC of GIS equipment for the CERMES Lab. In return for its contribution of GIS equipment, CERMES will cover travel and lodging expenses for two participants in the GIS course annually (to be nominated by CPACC). The RPIU currently provides support for one graduate student in climate change modeling. In line with longer-term objectives of transforming the RPIU into an independent climate change center, and building capacity at the national level to integrate climate change issues into national development plans, the RPIU should explore further options to obtain scholarships for students from participating countries who wish to specialize in climate change.

***Indicators of public/private involvement***

(a) Governments, public/private institutions, and other stakeholders are involved in the development and/or adaptation of methodologies and identification of options for improved adaptation planning and coastal resources management.
(b) National resources are allocated and leveraged to carry out or continue activities of adaptation planning and integrated coastal zone management.
(c) Interest is generated in other governments and institutions seeking to utilize the CPACC pilot project methodologies and techniques.

Each participating country has devoted substantial resources not only in financial terms but also in the valuable time of scarce technical and professional staff. However, effective involvement of institutions and agencies is limited by a general scarcity of human and financial resources. Nevertheless, countries take full advantage of all training opportunities offered by CPACC and participate nearly always in all PAC or Focal Point meetings. It is clear that participating countries and agencies involved with implementation of CPACC components have made an investment in the CPACC concept. The development of Coastal Resource Inventories will test country commitments to the project as it will require substantial resources to complete.

Interest in CPACC has been generated throughout the region, particularly in the pilot projects. For example: even though Barbados is not one of the coral reef monitoring pilot project countries, Barbados modified its existing program to adopt the protocols and methodologies of Component 5 and is now implementing a revised coral reef monitoring program, using its own funds, in parallel with the pilot project countries. There has also been a great deal of interest in attending pilot project workshops. Participating countries have funded additional participants and participants from countries outside of CPACC (Turks & Caicos) have attended. Another example involves the Government of Guyana which, as a consequence of the implementation of Component 6, has created the Integrated Coastal Zone Management Committee and is preparing a strategy for Integrated Coastal Zone Management.

Private institutions have generally not been targeted directly. Nonetheless, PETROTRIN, the Trinidad and Tobago Petroleum Company, has expressed interest in supporting the RPIU and has actively participated in discussions about the design and location of a future Climate Change Center. In several instances the private sector has recognized the technical expertise of National Focal Points by inviting them to make presentations on national climate change issues and responses. Moreover, interest in sea level and climate monitoring data has been expressed by several shipping companies, shipping agents and hotels. An explicit effort will be made under Component 1 to develop cost sharing arrangements with the private sector for the operation and maintenance of the stations.

CPACC is now developing a broader strategy to engage the private sector. Toward this objective, the RPIU has approached Canadian banking and insurance groups to enlist their support for a workshop on climate change and risk management in the region. As these groups have a substantial stake in hotels and tourism in the Caribbean, it is in their own interest to encourage the enforcement of coastal zone plans, building codes and other measures that would protect their investments in the face of increased catastrophic and long-term risk due to climate change. Moreover, the SIDS review meeting gave CPACC a specific mandate to study the impacts of climate change on tourism. CPACC has been charged with the responsibility in the region to conduct climate change vulnerability and impact assessments. As the results of these studies (Component 6) become available over the next two years, an explicit effort should be made to ensure that results are disseminated to stakeholders with policy jurisdiction and financial interests in sectors and industries at risk.

***Indicators of project continuity/sustainability***

(a) A long-term workplan has been defined and agreed for continuation activities of each component.
(b) Most responsibilities, technical personnel, and databases of the RPIU have been effectively transferred to UWICED and other regional institutions.
(c) The achievements and expertise of the NICUs are integrated into the national development planning process.
(d) Appropriate funding has been obtained for financing the continuation of CPACC activities in accordance with national and regional priorities.

In response to a presentation made by the RPIU Project Manager, the concept of CPACC evolving into a Caribbean Climate Change Center received the endorsement of CARICOM's Council of Ministers responsible for Trade and Economic Development early in 1999. Through active participation in international workshops and meetings, the Project Manager and other professional staff have raised the visibility of and interest in CPACC as an effective center for climate change activities in the region.

During the last supervision mission it was agreed that CPACC would prepare and submit a request to the

IDF to secure funds for developing this concept into a more formal plan. A proposal will be submitted shortly. There is some urgency here – since much work needs to be done to secure the center.

Starting in September of 2000, UWI's Environmental MSc. Program will offer several specializations. The specialization in climate change will be on the Cave Hill campus where the RPIU is located. The RPIU Project Manager has continued discussions with Canadian governmental agencies and organizations that have expressed interest in supporting a continuation of CPACC functions in the region.

During the last supervision mission it was agreed that a draft agreement to establish the trust fund for routine maintenance of the sea level and climate monitoring stations installed under Component 1 would be forwarded to the Bank for review and approval. The trust fund is to be established by April 2000. An additional initiative is now being designed to contribute to project continuation by generating income from subscriptions to receive data from the stations. This initiative involves fitting each installation with equipment to broadcast an instantaneous voice readout of the data and enlisting annual subscriptions from companies, hotels, port authorities, harbor masters and others to whom instantaneous data would be valuable.

On the issue of continuity of NICU efforts, the RPIU needs to formulate an explicit plan to promote NICU ownership of CPACC. The RPIU should set an explicit strategy for motivating some NICUs to take a more proactive stance in pursuing pilot projects and other CPACC activities. The evaluation of the Structure and Performance of NICUs prepared for the mid-term review includes several recommendations designed to get NICUs to take ownership of CPACC activities and include these operations in their routine work plans. The RPIU is already taking action on some of these recommendations. The key recommendations are:

- Interest and commitment at the highest political and administrative levels is critical to the success of project interventions like CPACC. The RPIU and the OAS should seek a fresh commitment from the respective Minister and administrative heads of the Ministries responsible for environmental issues;

- The design of future project interventions should be based on the results of a detailed analysis of the institutional capacity of the relevant implementation agencies. An integral part of this analysis should be an evaluation of the human resource capacity in the participating countries establish whether the expertise is available to undertake the tasks required;

- The RPIU should undertake the preparation of a public education and awareness strategy for implementation by the NICUs at the earliest opportunity. Such a component should include activities aimed at clearly demonstrating the social and economic benefits to be derived from the subject project;

- Results of the evaluation of the respective components of the project should be shared with the political directorates of the Participating Countries;

- The possibility of equipping the key collaborating agencies with computers should be examined;

- Reporting requirements for the project should be reviewed and a simpler format for the presentation of reports be introduced.