Executive Summary

This is the first update since the release of our *State of Georgia's Coast Report* in 2004. Although the region's general trends and conditions remain largely the same, the implications are more threatening because prior problems remain either unrecognized, unsolved, or made worse by regressive actions and complacency of state officials and many local governments.

1. Coastal Land Use, Development & Infrastructure
The coastal population has been growing steadily over the past several decades, largely due to in-migration from other states and the relocation of Georgians from upstate. However, until recently real estate speculation far outpaced the rate of actual population growth. In the past decade, the acreage of cleared and developed land has expanded at nearly double the pace that census figures would suggest. When credit was easy to get for development projects, and market prices for coastal lots rose mightily, many people invested in acquiring land and 'flipping it' for a quick profit. This resulted in many vacant lots and in some cases unused condos and marinas, accompanied by extensive soil erosion, contaminated coastal waters, and drainage sediments deposited in tidal marshes.

This gold-rush atmosphere abruptly ended with the crash of the credit market in the third quarter of 2008. Although many in the development industry suffer from the resulting under-employment, this period of hiatus and financial reform comes none too soon. Natural resources can no longer be put at risk merely for the speculative possibility of parlaying a small investment into a major financial windfall, leaving the public to suffer the consequences. Before making loans, lenders should require developers to demonstrate the need for their proposed projects and the adequacy of infrastructure available to serve them. Developers should be required to share a proportionate amount of all financial burdens of providing both infrastructure and environmental protection.

Local governments have been motivated far too often by the false assumption that development of any kind is favorable because it contributes to the tax base. To make this true, developers would have to be more willing to share in the cost of roads, schools, water/sewer, and police and fire protection. Unless land is developed properly and soon occupied after it is developed, public costs may readily outweigh tax revenues. And unless proportionate impact fees are imposed by cities and counties on development projects, the existing tax-payers and utility customers are likely to be subsidizing the profit-making ventures of developers.

Because of the environmental vulnerability of the coastal landscape, better conservation measures are needed in land development practices. However, most local government lack the technical ability, budget, and political will to apply these principles in regulating development.

If coastal Georgia hopes to retain or upgrade its quality of life, more attention must be given to evaluating building sites, the true costs and benefits of proposed development, and the most responsible means for providing public infrastructure required to support it. All of these factors need to be combined with the mounting need to realistically consider coastal flooding and storm hazards when designing and locating new facilities, both public and private. Environmental responsibility and fiscal responsibility go hand in hand.

2. Water Quality & Environmental Protection
The major source of water pollution in coastal Georgia, non-point source pollution, remains largely uncontrolled. This pollution is caused primarily by contaminants being carried by stormwater from upland areas into surrounding waterways and wetlands. The problem is especially severe in the coastal region because of the flat topography, seasonally high water table, low elevation, and extensive interlacing of wetlands and waterways within the landscape.

Development in coastal Georgia is often located on sites with inadequate drainage, unsuitable soils, and/ or filled wetlands. Furthermore, natural buffers required by the Georgia Soil Erosion and Sedimentation Control Act are commonly violated, improperly maintained, or completely disregarded. Drainage systems are often inadequate as designed or improperly maintained, and retention ponds fail to keep building lots from flooding after even moderate rains. Excessive areas of pavement and other impervious surfaces also add to water pollution by preventing stormwater from infiltrating into the ground, compounding the problem of contaminated runoff going into surrounding creeks, rivers, and wetlands.

The fact is that the low-lying, flood-prone and wetland interlaced coastal landscape does not lend itself to extensive use of conventional development practices. To accommodate growth while responsibly protecting water, wetlands, existing property owners, and wildlife, added precautions will have to be taken. Adoption and enforcement of more rigorous standards for selecting, designing, and developing building sites will require

technical regulatory capabilities that exceed those of many if not most cities and counties.

With federal financial reforms expected as a result of lax lending practices that culminated in the national credit crisis, there is reason to hope that reckless real estate speculation will be reined in. In any case, Georgia officials should take steps to revise policies that have not only condoned such speculation but promoted it. Unwise public subsidy of new infrastructure prior to demonstrated need has fed land market profit making by inflating value. This has created an incentive to subdivide and rezone property, clear land, disturb soil and pollute surrounding waters at a pace and scale that's totally unjustified.

The consequences for coastal water quality and wetland health have been disastrous. Dissolved oxygen, essential to fish and shellfish, has been declining and in some cases has reached dangerously low levels. That trend is a direct result of the reckless practices of development in coastal watersheds, both in the coastal zone and further upriver.

Water management may help this problem to some extent, but reforms in land use practices are also vital. As the state water management program slowly progresses, the fundamental relationships between land use and water protection must be given utmost priority. This not only means improving standards in land development and stormwater control at the local level, but it also requires recognizing the importance of properly regulating water withdrawals, wastewater discharge and reuse, and erosion control – all under state authority. And it means improving wetland protection under federal law. Efforts at all levels must be improved and to do so will require sufficient funding, provided in part by those who profit from using state resources – namely land developers.

3. Climate Change

Georgia is the only state on the eastern seaboard of the U.S. that does not have, nor is preparing, a state climate change action plan. Other states and the federal government are taking bold steps to adopt policies and practices that will either help control factors that are contributing to climate change or reduce damage likely to be caused by it. Many of these steps cost little and will help citizens, consumers, and tax payers in multiple ways, regardless of climate change.

For instance, by transitioning to hybrid or electric vehicles in the state motor pool, fuel expenses can be reduced and air quality will be improved. Similarly, by adopting low-waste requirements in state purchasing contracts, the costs of packaging and waste handling can be reduced. Added efforts to improve public awareness of these issues can help conserve water, eliminate unnecessary driving, and improve energy efficiency in homes and business, cutting utility and transportation costs for citizens and employers. Likewise, adopting energy efficiency standards for public buildings can save tax-payer funds used to pay utility fees. And by increasing the buffer width along streams and rivers, flood risks will be reduced and water quality will be improved, benefitting property owners, outdoor recreation, and public health.

The coastal area of Georgia has special reasons for being concerned about climate change. As global temperature rises and ice caps melt at an accelerating rate, sea level will continue rising. Reputable sources predict an average rise of about one meter (39 inches) by the end of this century, but it may be higher. Although predicted levels of rise vary, forecasts have moved upward as evidence of global warming mounts. Given the low slope of the coastal plain, a rise in sea level of one foot could produce ingress of water into areas 200 feet or more from shorelines and marshes. Coastal real estate having the highest per-acre value is often at greatest risk, as these areas commonly lie along marshes and shorelines, with elevated exposure to high tides, high winds, and storm surge.

Higher sea level will also increase the tidal reach of incoming ocean water, moving the brackish inter-tidal zone further upstream in coastal watersheds. This will shift the habitat of fish and shellfish, and due to geophysical features, the size of many habitats will be diminished. The natural migration of marsh, which would otherwise occur with rising sea level, will be constrained in many areas by constructed barriers, primarily highways. This could mean a loss of thousands of acres of Georgia's tidal marsh.

Georgians deny these trends and related risks at their own peril. Moreover, instead of adopting new practices that will create jobs, enhance environmental quality and reduce waste, by defending the *status quo* Georgia is losing economic opportunities that are being captured by other states that have a more realistic outlook. For instance, Iowa already has built a workforce of more than eighty thousand devoted to manufacturing wind turbines. Although Georgia has gained some benefits from expanding markets for renewable energy technology, such as the location of a solar panel manufacturer in Norcross, this was not a result of any state efforts. If Georgia developed a focused program for reducing carbon emissions and aggressively promoting renewable energy and energy conservation, far more economic benefits could be gained.

4. Governance

The accountability and transparency of decision making is essential to democratic institutions that are intended to serve the public interest. Authority given to elected and appointed officials must be held to standards that can be credibly verified by carefully examining the facts about who benefits, who pays, and the options available for responsibly meeting legitimate public needs. Unfortunately, the record does not sustain confidence that current decisions of public officials in Georgia are supported by objective use of science,

a clear consensus on or understanding of public interest, and unbiased treatment of all citizens.

A prime example is under consideration in the Georgia General Assembly as this summary is written (late March 2009). Driven by the misinformed notion that development interests should take priority over protecting waterways and wetlands, a bill pending in the final days of the legislative session would remove buffers from small streams. These streams are tributaries to Georgia's rivers, including the five major river systems that flow to the coast. Removing buffers along them will unquestionably increase pollution of state waters. When trout stream buffers were cut in half six years ago, UGA researchers concluded that the trout population plummeted by more than three quarters. And it is well-established that Georgia's water quality is threatened most by rainwater carrying pollutants from land-based activities into state waterways and wetlands. Natural buffers are the least expensive and most effective way to protect water quality.

In the same session, Georgia legislators failed to take action on a proposal to conduct a climate action study, an important step toward getting control of activities contributing to global climate change. At a time when the vast majority of scientists and the general population agree that worldwide warming trends are being significantly aggravated human activities (to repeat): *Georgia remains the only state on the eastern seaboard that has failed to adopt or develop measures to address the climate change issue*. The coastal region has the most at risk from the stubborn defiance of our elected officials on this issue. In addition to rising sea level, which will definitely increase the flooding (if not inundation) of coastal property in the years ahead, the intensity and frequency of major storms can be expected, and further harm to marine resources will occur. These adverse impacts on coastal areas must be addressed at all levels, including actions by the state that can help protect resources and citizens by improving energy efficiency in buildings and vehicles, controlling sprawl, and keeping new development out of harm's way.

In virtually every realm of assessment, the sustainability of Georgia's coast (and of Georgia's prospects as a state) is impeded by irresponsible actions of public officials, both elected and appointed. Based on years of observation, it is clear that the state's leadership has become more entrenched than ever in the foolhardy belief that short-term profit-making is more important than attention to long-term public interests.

As a result, the state's real prospects – both economic and quality-of-life factors – suffer. While Georgia officials tout the importance of the state's natural resources, including the economic value of recreational fishing, they continue to weaken and dismantle the very environmental controls that protect those resources. Similarly, officials cynically under-budget and reallocate state funds away from the management of public resources and the control of development. They rationalize this with unsubstantiated claims to be helping property owners and businesses, thus aiding the financial prospects of Georgia's citizens. Yet the actual impacts of such decisions often have the opposite effect.

Tens of billions of dollars of annual business revenue in Georgia is derived from existing natural resources. And the value of property in many places that Georgian's cherish most rests largely on the quality of natural surroundings, worth hundreds of billions more. If elected officials and appointees persist in viewing regulation as an impediment to profiting from development, our prized natural features and the resources they depend upon will continue to decline.

Yet the undermining and fragmentation of state authority used to safeguard environmental resources continues. Energy producers that use the most water from our rivers are awarded political favors while the state struggles with water management problems and legislators underfund water planning. Land developers are held to nominal standards of regulation by both local and state officials, and as population grows, state financial support of resource monitoring and protection diminishes. Instead of giving environmental permits more thorough review and requiring permit applicants to provide more information to use in evaluating impacts, state officials under-staff enforcement and demand expedited review at the behest of developers.

These trends and practices do not bode well for coastal Georgia, and they now appear to be worsening. Due to the national economic crisis, despite federal remedies being offered to states, Georgia officials are reacting to the situation by becoming even more fixated on promoting profit-making activities of any kind, regardless of the long-term implications. And they are increasingly reluctant to recognize the importance of regulating the private sector, despite the profound damage done by Wall Street when unleashed.

Recommendations

1. **Climate Change**
   Due to the critical importance of climate change, several actions deserve the most urgent priority to protect coastal interests.
   a. Mobilize public support and promote investor interest in developing offshore wind energy along Georgia's coast. This includes working closely with federal officials who are responsible for cultivating renewable energy and regulating its use.

   b. Launch an aggressive public information campaign about the risks of building in areas exposed to flooding, storm surge, and rising sea level. As forecasts of sea level rise are updated, release mapping and other information describing the areas at greatest risk.

   c. Seek federal and foundation technical and financial support for developing an aggressive, comprehensive energy conservation program. Central to this effort is public information about the importance of conserving energy and its significant economic benefits. This must include improvement in the design, production, and access to new products (including shelter) as well as retrofitting and adapting existing ones.

   d. Set state targets for two critical objectives: reduction of carbon dioxide emissions and conversion to renewable energy sources. (Suggested goals: 10% reduction in carbon dioxide emissions and 20% renewable energy production by 2020.)

2. **Accountability of government agencies**
   Reliable decisions that support public interest can only be ensured with greater clarity, transparency, and accountability required by law.

   a. If any individual business or sectors of business receives financial support from the actions of state authorities (directly or indirectly), detailed financial records of the operations receiving such benefits must be released to the public.

   b. Key decisions by state and local officials (elected and appointed) must be monitored to determine their impacts and the distribution of such impacts on members of the public. As appropriate, the expense of this monitoring should be shared with private parties who benefit from the decision in question. If monitoring reveals adverse impacts on public resources, every possible step must be taken to prevent further damage and to restore the prior condition of affected resources.

   c. Budgeting decisions must be supported by more complete analysis of the value of (and need for) public programs affected. For example, the public benefit provided by the protection of water resources and wildlife habitat must be considered, as well as analysis of the most recent trends in the conditions of such resources.

   d. A system of annual performance reporting should be adopted throughout all levels of government. Performance measures must capture substantive evidence of the results achieved and accurate description of beneficiaries. All such reports must be released for public review when they are completed.

3. **Land Development & Resource Protection**

   The proven methods available to make better decisions about site selection and site design must be put into practice as much as possible and as soon as possible. These methods will greatly reduce the environmental harm done by continuing coastal growth.

   a. Provide well-audited funding and technical assistance to local governments for their implementation of stormwater controls, emphasizing the use of green infrastructure to the maximum extent feasible. This assistance should be augmented by development fees paid into a dedicated fund established for that purpose.

   b. All proposed development must include analysis of soils. Hydric soils must be clearly identified and prohibited from being disturbed or developed. Sites with large amounts of hydric soils will be infeasible to develop and should be held for passive recreational use or conservation.

   c. Wastewater reuse standards must be revised to prevent the release of partially treated water in land application or direct discharge into waters of the state. Legitimate wastewater reuse systems should be promoted but they should be required to be carefully monitored and routine reports of results should be filed as public records.

   d. Patterns of land use should be controlled to reduce sprawl, but that goal must not be used to justify development of unsuitable sites. State and local governments must adopt rigorous standards for the location, timing, and financing of infrastructure to support more responsible land development and to prevent unfair subsidy of private projects by existing taxpayers.

   e. Private development of public lands must be closely monitored through accountable measures adopted by appropriate state agencies or the General Assembly. State agencies that propose to lease or sell public land for private use must first submit such proposals for review by professionals in the field of public land planning, recreation, and natural resource management as means of ensuring that the public interest is not sacrificed to private gain.

Coastal Land Use, Development & Infrastructure

- Coastal population growth continues at a steady pace, but at a rate far lower than land speculation over the past five years would suggest. [See population table in the appendix.]
- **Economic conditions have radically slowed growth rates**, but they will eventually recover.
- **There are tens of thousands of recorded lots already zoned for development** along the coast. This compares with approximately **250,000** housing units, about **90%** year-round, and **10%** seasonal.
- Developments of Regional Impact (DRIs) reviewed and approved by the Coastal Regional Development Center (CRDC) over the past 5 years include **proposals to build over a 168,000 new housing units**, in addition to proposing thousands of acres for commercial facilities and light industry.
- A major question is, **how long will the economic recovery take and how much will banking reforms reduce the previous rate of speculation**? This is critical because real estate speculation fueled rampant land clearing and development in recent years, causing extensive environmental harm.
- Once credit is readily available and consumer confidence is restored, **demand for coastal property will gradually resume, but probably to a more moderate average, in the range of 50 to 60% of what they were in recent peak years.**
- **There is a growing need for better conservation measures in land development practices**. (See *Green Growth Guidelines* and the *Coastal Supplement* to the *State Stormwater Control Handbook,* referenced in the appendix.) However, most local governments currently lack the technical ability, budget, and political will to apply these principles in regulating development.
- Reasonably, it can be assumed there **will be both increased federal incentives for using such controls in land development and additional technical assistance offered to local governments** that are willing to enforce them.
- With new growth, **there will be added demand for properly designed and maintained infrastructure, such as water and sewer systems**, which will be vital to healthy and environmentally sound communities.
- Such infrastructure systems are often built to serve small projects, with little or no consideration of a regionally integrated approach. **Even when city-county operations are coordinated, utility fees charged in one service-area may be used to subsidize infrastructure improvements in another**. Unless this outcome is prevented through better local financial controls, **existing utility users may be subsidizing public improvements supporting new development without knowing it**.
- To protect both environmental quality and fiscal accountability, **cities and counties should adopt and consistently implement capital improvement programs and corresponding impact fees that are well planned, integrated, and routinely evaluated**. (Note: Such a recommendation is supported by the regional planning that was done for the coast under a governor-appointed advisory group two years ago, but it has yet to be adopted.)
- **The true costs of supporting new development are poorly understood and not reflected in the decisions made by many local governments**. Proposed rezonings and new projects tend to be favored by elected officials due to the misleading assumption that they will generate more tax revenues than the cost of required public services.
- **The cost of expanding and maintaining infrastructure** (hardware) such as roads and water-sewer systems, and drainage structures, **are often under-estimated, which can shift such costs onto existing tax payers**. Financial burdens also include the administration and enforcement of land-use regulations, design and maintenance of drainage systems, and public safety (police, fire-protection, and emergency preparedness).
- As a result of underestimating the cost of public services needed for new development and over-projecting the tax revenues generated by growth, **many local governments tend to favor new projects and unrealistically limit the taxes and fees needed to cover the real costs of their support** in services and infrastructure. Over time, unless taxes are increased, this may lead to the deterioration of infrastructure and the quality of services.

A Sampling of Recent Major Coastal Development Projects: "Developments of Regional Impact"

Source: Georgia Department of Community Affairs and Coastal Georgia Regional Development Center

PROJECT NAME AND LOCATION	NUMBER OF RESIDENTIAL UNITS	COMMERCIAL SPACE In million square feet	INDUSTRIAL SPACE In million square feet	TOTAL ACREAGE
Belfast Siding (Bryan County)	10,731	3.15	3.75	3,339
Lampadoshia (Camden County)	14,750	2.25	--	10,735
Plum Creek –Jelks Tract (Liberty County)	9,950	5.29	6.89	
Liberty Harbor (Glynn County)	1,800	.30	--	
North Lyman Hall (Liberty County)	1,130	--	--	1,056
North Newport Plantation (Liberty County)	1,934	1.84	--	964
Turtle River (Glynn County)	6,066	--	--	2,783
Villages of Kingsland (Camden County)	40,000	9.5	13.5	14,898
TOTAL	86,361	22.33	24.14	

Developments of Regional Impact (DRIs)

The above table is a revealing display of the scale and impact of major coastal Georgia projects that have been approved through regional DRI review. The number and large size of these projects has been driven by unfounded speculation that was fueled by inadequately regulated use of credit and careless regulation. It is unlikely that this level of speculation will be regained in the aftermath of the 2008 credit crisis.

DRI review is conducted by the regional development center (RDC) in each of the respective districts of Georgia that were established by the 1989 Georgia Planning Act. (Most of Georgia's coastal zone is in the district of the Coastal RDC.) Unlike its counterpart in Florida, the depth of analysis in Georgia's DRI process is extremely limited by a 30-day review period, and it is not legally binding. In fact, the official DRI finding explicitly allows for the possibility that the project reviewed is "in the best interest of the state" while it "may not be in the best interest of the jurisdiction where it is to be located." Furthermore, DRI analysis tends to emphasize economic and employment potential of projects while only nominally considering their environmental impacts.

As with other development review processes done under Georgia programs, post-project monitoring and assessment is meager or non-existent. Although the unavailability of funding for such evaluation is the reason given for not doing it, without needed assessment the accuracy of project review cannot be determined and, over time, the permitting methods are unlikely to be improved to provide more reliable results. Likewise, since findings are non-binding, the parties involved can do whatever they wish regardless of the review outcome. As a result, the DRI process is little more than a presentation of a "for your information" analysis of factors related to proposed projects.

While the DRI review could be used to bring critical issues to the attention of regulatory agencies, there is little evidence of this potential being realized. This is probably due to the dominance of development and real estate interests in the politics of state and local government bodies that issue needed permits and related coercion to accommodate it.

Special Note*: Representation of real estate and development interests is common on city and county planning commissions and state-appointed bodies, including the Georgia Board of Natural Resources. Although there are often fundamental conflicts of interest in positions taken by the members of such bodies, these are seldom discussed in official proceedings. It seems only a matter of time before these conflicts form the basis for an effective legal challenge that revokes a decision made in violation of public interest.*

- **Coastal flooding** is a growing problem for two key reasons: (1) sites that are unsuitable for development or only marginally suitable (because of elevation, soils, and hydrology) are commonly approved for such uses, and (2) even small rises in sea-level compromise the capacity of drainage systems, causing them to fail during rainstorms. Backed-up drainage systems add to coastal flooding and compound non-point source pollution.

[See *Assessing the Costs of Climate Change in Georgia* by the Conference of State Legislatures and *Confronting Global Warming in the South* by the Center for a Better South. Both of these sources are cited in the analysis below.]

Water Quality & Environmental Protection

- **Water quality remains a significant problem for several reasons**: (1) marginal or unsuitable building sites are often approved for development (see "Coastal Flooding" item above); 2) building sites are located too close to wetlands, drainage ditches, and water-ways, contributing to contaminated run-off; and (3) developed tracts are significantly altered during construction by removal of native vegetation, filling of wetlands, engineering topographical features, and excessive use of impervious surfaces that radically reduce the landscape's natural capacity to absorb, filter, store and slowly release rainwater.
- **Intertidal areas are increasingly susceptible to environmental stresses caused by drought**. Reduced freshwater flow from upstream into tidally influenced creeks and rivers results in higher levels of salinity. Prolonged drought, exacerbated by landscape alterations (see 'Coastal Flooding' item above) can cause extended periods of higher salinity in intertidal areas important as wildlife habitat. Over time, these areas can be altered enough to cause reduced population and health in certain vulnerable species. For example, the problem of a lethal blood disease in blue crab is connected with higher salinity. The die-back of marsh grasses in some areas also appears to be linked to such salinity increases, although some recovery has occurred as drought diminishes.
- Because the major threat to water quality is non-point source pollution, **with further growth in coastal watersheds (not only on the coast), continued decline in water quality is expected**. (Dr. Peter Verity at Skidaway Institute of Oceanography has thoroughly documented the correlation between low dissolved oxygen and coastal development. (*Please see the appendix*.)
- A significant way to prevent the downward trend in water quality is to **adopt and consistently apply environmental conservation practices** in coastal

Desalinization

Desalinization has been proposed as a water supply source, but it is very energy intensive. Power plants generating electricity use large amounts of water for cooling, much of which is not returned to the original source. Thus, to process brine into fresh water using desal itself requires large amounts of fresh water because so much energy is needed. Therefore the net amount of water gained is significantly reduced. [Reverse osmosis requires some 2,500-12,000 kilowatt hours per acre-foot (or 325,851 gallons), depending on the quantity of salt in the intake water.]

- The goal of reducing per-capita energy demand would be severely impeded by the use of desal as a water-supply alternative. Improving energy efficiency is an important part of enhancing water management, since energy production from conventional power sources is such a major water user.

- Like other engineering approaches to extending water supply, using desal would undermine incentives to conserve water and achieve improved efficiencies in water use. Conservation is a much more responsible and inexpensive way to manage water than to accommodate wasteful demand, especially using such an energy-and-water squandering method as desal.

- Using desal on the coast would have the effect of politically rationalizing the withdrawal of increasing amounts of water by upstate users from supply sources essential to the coast's complex, productive, and fragile ecosystems. The health of coastal marshes and fisheries would be degraded due to freshwater sources being depleted, especially during periods of drought. (NOTE: The impacts of drought can be expected to increase as wetlands continue to be ditched, drained, filled and paved over by inadequately regulated developers.)

development activities. The effect of these practices is to reduce the disturbance of water flow and water quality by preserving, restoring, or replicating landscape functions that store, release, and filter water. **However, there is political resistance to adopting such measures, believed to be caused by the misperception that they will prevent development from being profitable**.(See *the Draft Coastal Supplement* to the *Georgia Stormwater Control Handbook*, 2008 and *Green Growth Guidelines*, 2006 in the appendix.)

- **Vegetated buffers protecting waters of the state are mandatory** under Georgia's Soil Erosion and Sedimentation Control Act, but these are not consistently enforced. Moreover, research strongly suggests that the 25-foot buffer requirement is inadequate, and it should be closer to 100 feet. Driven by development interests, public officials have been making efforts to remove buffers on so-called 'intermittent' streams, which flow only after rains when they carry runoff to rivers used for drinking water, fishing, and recreation. If such buffers are removed, when rain occurs, accumulated contaminants would be channeled into waters used by the public. This added pollution would compound existing water contamination problems, causing further risk to public health and fish habitat. One indication of the extent of this impact was revealed after Georgia legislators cut trout stream buffers in half several years ago. Subsequent research found a loss of more than three quarters of the former trout population. If Georgians hope to continue enjoying the recreational and economic benefits of healthy water resources, buffer requirements must be retained, enforced, and – ideally – increased. This includes buffers protecting freshwater wetlands, rivers, streams, ponds,and tidal marshes.

- **Community docks & marinas** are regulated under Coastal Marshland Protection permits administered by the Coastal Resources Division of Georgia DNR. For the past several years, there has been interest in establishing limits on the size of these structures based on research about their adverse impacts on coastal marshlands. These impacts include marsh destruction caused by shading and the shoaling and erosion of adjacent areas. In 2007 it became clear that long docks and walkways across the marsh were also causing the accumulation of dead marsh grass (called "wrack") when these structures prevent normal tidal flow from carrying the natural debris away. If wrack builds and persists long enough in one place, marsh grass beneath dies due to lack of sunlight and adequate ventilation, leaving mud flats. Depending on where the wrack is deposited and how long it persists, the impact can destroy certain species essential to marsh ecology, such as mussels. It is also believed that prevailing wind direction and tidal flow characteristics relative to the orientation of the dock structure are factors that influence where destructive wrack accumulation occurs. DNR is currently considering further steps needed to improve the regulation of docks and marinas and is advocating research of the marsh wrack accumulation problem.

- **Marsh loss due to tidal flow restrictions has also been observed.** Hundreds of acres of once functional marshlands have been removed of all vegetation when elevated roadbeds cut off such areas from the flushing action of the tide cycle. Although all modern roadways across marshes are built with culverts if not bridges, the openings provided by these structures can silt in over time. Likewise, silting can be made worse by coastal development that causes erosion of soil that is carried into the marsh by drainage ditches and creeks. If culverts are not properly maintained and erosion control measures are not properly practiced, further marsh damage will occur.

- **Septic systems** are widely used for wastewater processing in many places within the coastal watersheds, but very few of the soils are suitable. (Please refer to the map of hydric soils from the *Coastal Comprehensive Plan,* which appears in the appendix.) Drain fields having either soils that are quickly saturated due to a high water table or soils with clay content (which prevents infiltration and breakdown of septic outflow) are believed to be a significant source of water contamination in coastal Georgia. When either of both of these soil conditions occurs, during a rainstorm partially decomposed septic waste is carried into surrounding waterways, either across ground surface or at shallow depths just beneath the surface.

  Note that the effectiveness of drain fields can also be compromised by the alteration of hydrology in surrounding areas, especially when lower areas are filled so they no longer retain stormwater and

when previously undeveloped sites are paved over, adding to the amount of runoff.

The extent of the problem of septic system pollution in coastal Georgia has not been adequately researched. However, limited sampling reveals failure of local septic systems that strongly suggests a threat to regional water quality. Furthermore, as the concentration of development increases, it is reasonable to conclude that such contamination will get worse unless individual septic systems are converted to sewage collection and central treatment systems that are properly designed and operated.

As with other coastal hazards like flooding, rising sea level is expected to worsen the contamination of coastal waters by septic systems. This is because the water table 'lens' will come closer to ground surface as sea level rises, and soils will become more prone to being saturated even when low-lying areas are not flooded.

- **Despite the theoretical logic of reusing wastewater as a water conservation technique, state regulators have inappropriately applied the term "reuse" to systems that will operate as traditional wastewater discharges onto land or into streams.** Land application serves as a disincentive to reuse wastewater because EPD-issued land application system permits do not require treating to reuse standards before discharging onto the land, unless this water is being sold back to customers for reuse. Generally, land application system permits only require that the effluent meets primary treatment standards, since breakdown of contaminants by microbes in the soil is supposed to be part of the treatment process. But in the sandy soils typical of the coastal region of Georgia, the land cannot adequately process the water to sufficiently remove nutrients. The resulting discharge of wastewater onto land contaminates shallow groundwater, wetlands, and streams.

- **Drought Management**

  Georgia has been suffering from drought for many years. Although drought on the coast has been less severe, annual rainfall remains well below the historic norm. The best way for dealing with drought is to conserve water by curbing wasteful practices, capturing and treating wastewater, installing more water-efficient equipment and restoring hydrological features such as wetlands. Studies have shown that water conservation can reduce water use by 20 to 30% or more. Drought management is part of Georgia's comprehensive long-term water management planning program, but the program is underfunded and seems to have lost priority among state leadership. Moreover, the state faces a $2.2 billion deficit and is cutting back on many programs. And the biggest single water users, electric-power producers, are exempt from state-sponsored conservation efforts.

Drought and Climate Change

"A higher risk of drought is a possible consequence of climate change. Higher temperatures cause more surface water evaporation, in effect offsetting increases in precipitation. Georgia witnessed an extreme and costly drought in late 2007. At one point, more than 50 percent of the state experienced "exceptional and widespread crop/pasture losses" and "shortages of water in reservoirs, streams, and wells creating water emergencies." Georgia still is recovering from this drought, which gripped most of the Southeast in 2007. Overall, the drought caused $1.3 billion in economic damage to Georgia. If an additional 5 percent of crop losses are experienced due to climate change impacts, the direct and indirect economic losses could total nearly $110 million annually."

Source: *Assessing the Costs of Climate Change in Georgia* by the Conference of State Legislatures, 2008.

Global Warming, Sea Level & Climate Change

"Now, with rapid change, federal agencies, including the Fish and Wildlife Service, the Forest Service and the National Oceanic and Atmospheric Administration are beginning to draft management policies that take global warming into account. NOAA Assistant Administrator Richard W. Spinrad advocates creation of a national climate service to give agencies across the federal government better access to scientific projections so they can anticipate and plan for eventualities such as extended droughts and changes in water flows."

Source*: Warming Trends Alter Conservation—Experts Think Old Paradigm of Fixed Boundaries Will Not Work as Sea Levels Rise*, By Juliet Eilperin, Washington Post Staff Writer, Sunday, January 25, 2009

As implied in the quote above, climate change is expected to result in mounting problems for many places, especially areas along ocean coastlines where

sea level rise will add to flooding, erosion, and storm surge damage. For several years the Center for a Sustainable Coast has been tracking related issues, making efforts to raise public awareness about them. And for the past decade, many Georgians have witnessed the damaging effects of drought, which are correlated with weather dynamics altered by climate change. Although scientists are currently unable to confirm the causes of drought in the Southeast, as a precaution Georgia should prepare by adopting and rigorously adhering to a **drought management plan**. And the state should adopt and begin implementing a comprehensive "**climate action plan**" as soon as possible. (Please refer to more details below.)

Sea Level Forecast in Georgia (2007)

Sea levels along the Georgia coast are rising due to increasing global temperatures—records show that sea levels at Fort Pulaski, on the Georgia coastal border with South Carolina, are rising at a rate of 13 inches per century. Levels could rise 25 inches by 2100 if the current rate of climate change continues.*

Source: Earth Institute at Columbia University, *Next Generation Earth: Georgia*, www.nextgenerationearth.org/contents/view/18.

**** Note that sea level rise forecasts are being revised upward every time another study is released by the Intergovernmental Panel on Climate Change. With each such revision, impacts of climate change are predicted to be greater than previously forecasted.***

~ Center for a Sustainable Coast

[Quoted passages that follow are from *Assessing the Costs of Climate Change in Georgia* by the Conference of State Legislatures, 2008.]

Infrastructure Impacts of Climate Change

"Most of the stretch of I-95 in Georgia lies within five miles of the coastline. This is an advantage for delivering goods to the shipping industry but increases the risk of storm damage."

"Ports [in] Brunswick and Savannah facilitated the trade of more than 24 million short tons of goods in 2007, a 58 percent growth in trade volume during the past five years. Port Savannah is the fastest growing container port in the eastern United States, and Port Brunswick is the fourth largest auto port there. Near Port Savannah is the Elba Island liquefied natural gas terminal, one of five in the nation. Both ports are valuable to move goods to the southeastern United States because of their proximity to I-95, the easternmost U.S. north-south highway corridor. **Rising sea levels threaten the reliability of these ports and their economic contribution to Georgia."**

"Most of the electricity generated in Georgia comes from coal and nuclear power, both of which require [large amounts of] water for operating and cooling. In 2000, fossil fuel and nuclear power plants accounted for more than half the total surface water use in Georgia. **As sea level rises and contaminates fresh water, these thermo-electric power plants could compete for limited fresh water resources. Higher demand on limited water supplies could add to the cost of electricity generation**."

[NOTE: Demand for fresh water in Georgia is already critical due to the combination of population growth, drought, and wasteful practices by all user groups. **The Center for a Sustainable Coast continues to assert that Georgia's energy policy can no longer be insulated from state water management because issues raised by the two are vitally entwined**. In light of water management concerns, we strongly advise the use of alternative forms of energy that require little or no fresh water – primarily wind, solar, and tidal. These sources and the technology needed to harness them are already well proven throughout the world. **Long-term commitment to water-intensive energy production using fossil or nuclear fuels must therefore be rigorously avoided**. This will require a major shift in the politics of energy production in Georgia.]

Hurricane risks & related damage

"Many scientists see mounting evidence that hurricanes are increasing in number and intensity and they attribute the cause to climate change, although some scientists debate this contention. Hurricanes also pose a real threat to shipping ports—Hurricane Katrina caused $435 million in damage to the Port of New Orleans, and damage to the Port of Gulfport was between $300 million and $400 million. **Hurricanes could cause similar damage to Georgia ports. For example, Hurricane Ivan caused $68.8 million in property damages to Georgia in 2004.**"

Sea Level Rise and Property Risk

"Rising sea levels and more frequent and intense hurricanes pose a serious threat to properties along Georgia's 100-mile coastline.

"The value of insured coastal property in the United States rose 179 percent from 1980 to 1993. The real estate sector represents 10 percent of Georgia's state gross domestic product, about $37 billion.

"Property damages have increased 300 percent from an estimated $125 million in annual losses between 1900-1940 to half a billion dollars each year from 1960 to 1980. Most of the increased cost of damage from hurricanes can be attributed to the development of high-value properties on the coastline.

"Many scientists see mounting evidence that hurricanes are increasing in number and intensity and attribute the cause to climate change, although some scientists debate this contention. Hurricanes also pose a real threat to shipping ports—Hurricane Katrina caused $435million in damage to the Port of New Orleans, and damage to the Port of Gulfport was between $300 million and $400 million.

"Hurricanes could cause similar damage to Georgia ports. For example, Hurricane Ivan caused $68.8 million in property damages to Georgia in 2004".

- Conference of State Legislatures, 2008

State Actions Needed to Address Climate Change

- Georgia is among only 12 states total—and the only east coast state—without a climate action plan either adopted or in progress.
- Advanced alternative energy and decreased reliance on coal can result in tremendous public health benefits. Georgia has experienced as many as 946 deaths in a single year attributable to pollution from its 10 existing coal-fired plants.
- Many states have enjoyed net economic benefits amounting to millions, even billions, of dollars through energy efficiency measures.
- Georgia has significant potential for rapid conversion to solar and wind energy, but has made little effort to achieve that potential.
- With little help from state government, the private sector in Georgia is already moving toward new energy sources, but the pace and public benefits could be greatly advanced with more aggressive policy initiatives.
- Use of solar energy for heating buildings and water has reached 20% in other areas of the country. Solar panel manufacturing has begun in the Atlanta area and is already an important domestic export.
- Wind mapping of areas off of Georgia's coast gives evidence of at least 10,000 megawatts of available energy, the equivalent output of 10 power plants.

To fully recognize the impacts of climate change on coastal wetlands, there will need to be a better understanding of the linkages among upland, wetland, and oceanic responses to changing conditions.

Source: *Status & Trends of Wetlands in the Coastal Watersheds of the Eastern United States* (National Marine Fisheries Service, NOAA, January 2009)

sustain a rich diversity of life that is extremely important to many ocean species. Marine scientists estimate that some 70% of ocean life depends on these inter-tidal zones as nurseries and nutrient sources. Higher salinity, made worse by drought as well as sea level rise, will tend to push the inter-tidal areas further landward. But the westward migration of tidal marshes is restricted by man-made structures, predominantly highways.

As a result, many intertidal habitats will be compressed between marine areas with maximum salinity, and development along the mainland. Loss of tidal marsh areas will proportionally reduce their natural productivity. Over time, this could have drastic implications for fisheries, including shellfish as well as many finfish species. Such adverse impacts will bring huge losses in the economic benefit of coastal fisheries, currently valued at more than $600 million a year in Georgia alone. Likewise, freshwater wetlands in the lower end of coastal Georgia's watersheds will be converted to tidal wetlands, which will cause still other adverse impacts on fish, wildlife, and the economy.

Legislative Climate Study Committee Proposed

Create a Joint Legislative Study Committee to draft a Climate Action Plan for Georgia that would explore options addressing:

- energy efficiency and conservation;
- state facilities and purchasing;
- clean, advanced and renewable energy supplies; sustainable job opportunities;
- emissions reduction targets;
- transportation and land use improvements;
- forest and farm conservation; and
- industrial process improvements.

Note: ***This proposal was never voted out of committee in the 2009 General Assembly***.

Storm Preparedness, Flood Damage Prevention & Land Use

As sea level rises, the risk of coastal flooding increases. Yet coastal communities continue their conventional land-use regulation practices that tend to accommodate new projects with little or no attention to such factors. These projects are often proposed in areas

very vulnerable to storm surge and flooding – including sites along rivers, marshes, and ocean. In addition to imposing escalating threats to property, such risks raise serious questions about the ability of coastal communities to evacuate their citizens quickly when severe weather approaches.

There are several underlying issues that need to be better understood to respond to such questions. One has to do with the capacity of the road network to accommodate ever increasing numbers of evacuees. Another is consideration of the least mobile groups, such as the elderly, hospitalized, and handicapped, who must be evacuated with the assistance of dedicated equipment and personnel. As these special-needs groups grow in number, evacuating them along with the rest of the population becomes more difficult.

Retreat from High-Risk Areas

As one means for dealing with these issues, land planners aware of climate change are advising land-management agencies to begin retreating from areas of high risk. This means not rebuilding or actively reusing these areas when it's proposed, and not permitting the clearing and development of new sites in locations at risk. But many such areas are desired building sites because of their vistas across water bodies and marshes. This means that market demand will work against rational planning related to storm hazards. Unless new policy is adopted, this trend is likely to resume as real estate markets recover over the next decade.

A related facet of this issue working against retreat from high-risk coastal areas is traditional development potential and the land values that are associated with it. If land has been acquired at prices determined by the market, the only fair and politically feasible way to keep it from being developed is to purchase it for conservation. Local and state governments do not have sufficient budgets to afford buying conservation lands at the scale needed to make this an effective remedy, even if they recognize the need to do so.

One remedy would to establish a federal program to assist in vacating high-risk land by providing powerful tax incentives and attractive property exchanges. The latter could be facilitated through federal policies that underwrite government programs tied to bank-financed properties that are in default. Such properties could be offered in direct exchange for those located in coastal zones of high risk.

Another, more politically difficult, option would be to eliminate all public subsidies for such areas, including federal flood insurance, low-interest government loans, and infrastructure grants. Over time, this would induce many property owners to reduce the intensity of land use in areas of high risk, if not abandoning them altogether as homesites.

NOTE: In an online submittal to the Obama Administration in February 2009, the Center for a Sustainable Coast suggested the above method for retreating from high-risk areas as well as integrating other federal activities related to climate change. [*For details*, *see the Center's website at www.sustainablecoast.org*.]

Governance

Environmental sustainability cannot be advanced without improving the accountability, timeliness and transparency of the decision-making of public bodies. These include the Georgia General Assembly, Congress, city and county governments and the myriad public agencies and appointed boards at all levels of government, including the Board of Natural Resources. There remains a troubling lack of clarity, openness, consistency, and fairness in the way many of these public institutions take actions, which have serious, often long-term and mutually conflicting consequences that work against the public interest.

Foremost among these deficiencies is the biased and inadequate use of information in reaching decisions. Following are brief summaries of such failures of public bodies in recent issues as they affect Georgia's coast.

Jekyll Island – Over the past two years, controversy has raged over the impacts of proposed development projects at this barrier island state park. Despite a restriction limiting development to no more than 35% of the island's area, the governor-appointed Jekyll Island Authority board has proposed intensive land use that is likely to threaten both natural resources and the serenity of the visitor's experience, which are the source of the park's renowned appeal.

Contrary to the recommendations made by top professionals in the field of public land planning, the Jekyll Island Authority has adopted a financial model to gauge the extent and type of development to take place within the State Park, neglecting how the proposed "build-out" of the island would affect Jekyll's character, natural systems and the quality of the visitor experience. Drawing upon an analysis of the long-term impacts of development on Jekyll Island done by a consultant without experience in public land planning and recreation management, the Jekyll Island Authority speaks of the need to double Jekyll's built environment to allow the island to reach its economic potential and

provide the JIA with the funds it claims to be needed to operate, maintain and improve the state park.

This same consultant has provided the Jekyll Island Authority with a fundamentally flawed density study that purports to show that the built-out Jekyll of the future will compare favorably with other coastal resorts in terms of population, housing, lodgings and traffic volume. Unlike Jekyll Island, the communities used as a basis of comparison consist primarily of private development on private property, and none contain a substantial area devoted to conservation.

Equally disturbing is that the lion's share of revenues to be generated by the proposed Jekyll build-out would go to private parties, not the public. Land used for this development would be leased from the state at nominal rates, millions of dollars of state financial incentives and yet 99% of profits from the sale of condos and time-share units would be kept by the developer. Meanwhile, four beachfront hotels are being rebuilt and a Jekyll town center is being constructed, which, collectively, will add over 1,000 hotel rooms and more than 400 condos and time-shares to Jekyll's lodging stock. These projects alone will provide more than ample overnight capacity to support sustainable use of the state park, making the forecasted build-out appear even more unnecessary.

Cumberland Island

This federally designated National Seashore was established by federal law in 1972. A decade later, the northern half of the island was designated a "wilderness area" to protect the natural features of this mostly undisturbed barrier island. But concessions made by Georgia Rep. Jack Kingston and other legislators resulted in the approval of a paved road to run the entire length of the island, ostensibly to facilitate higher levels of visitation and access. This road splits the wilderness area of the island, conflicting with the purpose of the 1982 designation made by Congress.

Although the island remains accessible only by boat, paved roads are in direct conflict with wilderness status of Cumberland's north end, and greater use of motorized vehicles will undermine the treasured experience of visiting a barrier island in its natural state. Disruptive compromises have also been made by the Georgia Department of Natural Resources, which has issued hundreds of beach-driving permits for members of the few (but evidently very large) extended families who own private residences at the south end of the island. Since the federal designation of Cumberland Island was made in 1972, subsequent decisions by public officials have deviated significantly from the originally intended public purpose. The foremost issue is not the number of visitors (within reasonable limits), but the quality of visitor experience as intended under the National Seashore designation.

Coastal Comprehensive Plan – Between fall 2005 and March 2008, a 35-member governor-appointed 'coastal comprehensive plan advisory committee' developed recommendations that were intended to promote balance between the economic development and environmental quality of coastal Georgia. (Despite the balance aimed for, appointments to the advisory group were dominated by business and real estate interests.) The proposed plan is intended to provide incentives for local governments in improving environmental controls used in land use decisions. While the goal is quite worthy, the approach must be strengthened by using more reliable measures of "quality growth" that reflect on-the-ground coastal conditions and trends – such as water and air quality, wise water management, and the sustainability of economic development.

Extensive assessment done in producing the plan lacked important details about coastal environmental problems. Many of these problems, such as water pollution, are directly linked to land development and reflect the failure of local and state government to adequately monitor and control the impacts of growth. For instance, the text in the plan assessment document reports that "According to Natural Resources Conservation Service findings, the majority of the coastal area is either poorly-suited or only marginally-suited for development due to the drainage characteristics of soil types." Yet the analysis make no attempt to explain how the ongoing coastal development patterns compare with the NRCS findings and what the implications are for natural resources. Similarly, in a brief comment about "Plant and Animal Habitat," the assessment merely refers to a table of currently listed threatened and endangered species, making no comment about the impacts of coastal development on these species of concern or their habitat. As a result the "Assessment" is really more of an inventory because it lacks appropriate analysis of natural resource conditions and the threats to these resources caused by coastal development patterns and practices.

In addition to an assessment identifying these problems, the plan should propose specific methods for controlling or preventing them. Such methods would presumably include establishing criteria to be used in locating and designing roads, water and sewer systems and other

infrastructure that supports development. Infrastructure should be guided by a comprehensive evaluation of related consequences, which is not only often lacking, but reactionary and fragmented under current practices. Such analysis should include assessment of the energy demands of development as well as the energy sources to be tapped in meeting them. To ensure successful outcomes, accurate performance indicators should be adopted so that the public has a clear understanding of the accumulating effects of development trends on the quality of life and their sustainability over the long term. Evaluative criteria should include reliable means for determining the vulnerability of new development to flooding, storm surge, and emergency evacuation to reduce the risks imposed by coastal natural hazards.

Savannah Harbor Expansion

To the credit of Georgia Ports Authority, and thanks to a Congressional requirement, there has been a lengthy process for stakeholder involvement in the prolonged review of a deepening project proposed for the Savannah River. A 26-mile channel to the main port facilities at Garden city upriver from the City of Savannah could be deepened from 42 feet at present to as much as 48 feet if this project is approved. Despite the efforts of GPA, the Corps of Engineers, and more than thirty representatives of various stakeholders (including the Center), answers to fundamental questions remain disturbingly uncertain. Among these questions are the combined impacts on the river and other public concerns related to multiple major projects in the river basin.

These include the reactivation and expansion of the liquefied natural gas (LNG) processing facility at nearby Elba Island and the proposed expansion of Plant Vogtle upriver near Augusta. The profound lack of systemic assessment of these projects in combination with the port deepening is compounded by problematic economic forecasting (used to estimate port project benefits) and the rising prospects of building another port facility across the river (and closer to the ocean) in Jasper County, South Carolina, which could cut benefit estimates.

Furthermore, although port activity at Savannah had been growing rapidly in recent years, the current global economic crisis and its uncertain but plausibly sluggish recovery suggest a much lower level of trade in coming years. Moreover, troubling doubts about the reliability of computer models used to predict impacts on highly valued natural resources in the harbor's vicinity raise grave questions about the accuracy of project evaluation. Due to conventional methods used by the Corps in such projects, there is inadequate commitment to the monitoring and assessment needed to ensure minimum damage if impacts deviate from predictions.

The Savannah Harbor Expansion project epitomizes the difficulty of defending the public interest when making decisions about actions with such complex, interrelated, and potentially (and irreversibly) damaging impacts are based on analysis that isolates one project from others in the same watershed. Two major revisions to project evaluation and mitigation are needed: systemic analysis and adaptive management.

The Center for a Sustainable Coast attempted to at least partly remedy these deficiencies by convincing the Stakeholder Evaluation Group (SEG) to adopt a one-page guidance statement setting forth conditions to ensure reliable tracking, control, and mitigation of project impacts if the project is approved. (Please refer to the appendix to review the complete text.) The SEG recommended that GPA in turn advise the Corps of Engineers to use the requirements set forth in adopted guidance when the Corps conducts project review and plans mitigation, which GPA agreed to do.

Liquefied Natural Gas Facility (Elba Island)

The Elba Island Liquefied Natural Gas re-gasification facility is located less than three miles downriver from Savannah, in the middle of the Port of Savannah channel, and immediately beside the proposed Port of Jasper site. This location for the LNG facility epitomizes the profoundly flawed decision-making that results from the complacency and aimlessness so commonly exhibited by Georgia's state and local government officials. Of the more than three dozen other attempts to build new or expanded LNG sites on the East or West Coasts of the US, every single one has been fiercely opposed by local and state representatives, and to date only one other expansion has been built and no new sites have been approved.

The other expansion, Cove Point in Maryland, is in a remote area, far from population centers or shipping channels. On the West Coast, LNG re-gasification operations have been built in Mexico because the western states wouldn't have them. Off-shore facilities are planned near Boston, New York and New Jersey because all attempts to build onshore have been

blocked. Only Savannah has the unenviable distinction of serving the Northeast much as Mexico serves the West Coast: a place where acquiescent politicians allow extreme hazards that more responsible representatives would never tolerate.

The Elba Island site, as well as the LNG tanker ships which service the re-gasification operation, present a clear and present danger to tens of thousands of residents, the Port of Savannah's operations (which could be closed for years if a tanker ship ignited in the channel, whether accidentally or as an act of terrorism), and thousands of acres of already stressed salt marsh, which would take years to recover if a major LNG catastrophe occurred. This destruction would encompass at least a two-mile diameter burn zone, and it could be as much as 6 to 10 miles across. Each tanker contains the thermal equivalent of 55 Hiroshima nuclear bombs, and the tank farm contains far more damaging power than that. Two huge new LNG tanks, each one bigger than any other LNG tank in the world, are now being constructed. When completed they will double the capacity at Elba as well as escalating the destructive scale of a catastrophic event.

The Center is working with the Sierra Club and Savannah's Citizens for Clean Air and Water to raise public awareness of the LNG danger, and to promote local and state political intervention to curtail and eventually remove these hazards. Such hazards are unacceptable in the best of times and tragically foolish during a period of global terrorism.

Plant Vogtle Nuclear Power Expansion

In March 2009 the Georgia General Assembly passed a bill that will allow Georgia Power to collect fees from residential energy customers that will offset diverse costs for adding two more reactors at Plant Vogtle on the Savannah River near Augusta. The bill was reinforced by a contentious vote of the Public Service Commission.

"This results in the prepayment of $2 billion to Georgia Power; 75 percent of that money goes to profit for the company and taxes on the profit six years before the nuclear units produce a single kilowatt of power or we ever benefit from the service.

"The PSC public interest advocacy staff, which is charged with balancing the interest of the ratepayer and the utility, advocated against the CWIP, stating, There can be no serious question that CWIP is harmful to rate-payers. It will cost ratepayers more, deprive ratepayers of the use of their money during the construction period, and create intergenerational inequities."

[Source: DO GEORGIANS GAIN FROM PSC VOTE ON NUKE PLANTS? Opinion by Angela Speir Phelps, formerly with the PSC, published in the *Atlanta Journal Constitution* on March 26, 2009.]

Aside from the controversial consumer-rights issues in this decision, giving the go-ahead for expanding the use of nuclear power to produce energy is in direct conflict with water management goals of the state. Although some cooling water would be returned to the river, about 40 million gallons a day would be converted to vapor by the cooling process proposed for the plant expansion. This would double the existing adverse impact of the Vogtle Plant on the Savannah River.

At a time of increasing competition for fresh water supplies on both sides of the Savannah River, reduced river flow due to drought, and serious problems causing low dissolved oxygen needed to sustain fish habitat, converting to sources of energy requiring no water must be given higher priority. Foremost among these alternatives is offshore wind energy, which has been well researched already by Georgia Tech's Strategic Energy Institute. In a 2007 report (*Southern Winds*) it was concluded that there is ample offshore wind to sustain thriving energy production along Georgia's coast.

Offshore energy development in various European countries has been proven to be reliable and far less expensive than nuclear powered facilities. Also notable is that offshore wind generators take only three to five years to build and put online, compared with eight to ten years for nuclear facilities. And it is estimated that cost per unit of energy produced using wind power is less than half as much as nuclear energy, not included the substantial cost of storing radioactive waste. Moreover, analysis of all costs related to nuclear power suggests that it will actually worsen climate change problems.

(See appendix: *Amory Lovins: Expanding Nuclear Power Makes Climate Change Worse,* in *Democracy Now, July 16,2008.)*

Around the time that *Southern Winds* was released, Georgia Power reserved areas along our coast made available for wind development by the federal Minerals Management Service, which regulates these areas. It seems clear that those who are profiting from the sale of energy produced from conventional sources (regardless of the costs to consumers and impacts on public resources) aim to prolong their command of the market as long as possible. Aided by Georgia's Public Service Commission, the General Assembly, and profit guarantees that are ensured through state rules for setting utility rates, Georgia Power enjoys uniquely protected financial benefits and related political clout that impedes the timely use of renewable energy in Georgia.

State Water Management Plan

In light of the above, it is noteworthy that the Georgia Environmental Protection Division has exempted energy producers from water conservation requirements of the state water management plan. At the same time, EPD (as well as many non-profit groups) correctly asserts that water conservation is the least expensive way to improve water management by reducing demand. And since there are available but underutilized energy sources that require little or no water (wind, solar, tidal, etc.), it makes sense to rapidly switch to them instead of increasing our dependence on high-temperature coal and nuclear plants that are the largest water users in the state.

Furthermore, Georgia's water management planning effort remains seriously underfunded and, unless federal funds are made available, it is unlikely that the plan will achieve timely results. The urgency of improving water management has become even more critical because of prolonged drought. Meanwhile, efforts are underway in the General Assembly to weaken water protection in the state by proposing to remove buffers required on certain small streams. Scientific research clearly demonstrates that reducing or eliminating buffers will seriously compromise water quality and fish habitat.

Statewide, the wasteful use of water for power production, combined with the reckless dismantling of water protection requirements and the continued disruption of landscape hydrology by extensive ditching and draining, is amplifying the destructive impacts of population growth. Such impacts could be greatly reduced if the state's water management program was more rigorous and if it were more integral to related state policies, including energy, economic development, and infrastructure funding. Lacking these features in state policy or the political motivation to provide them, further growth will cause unnecessary degradation of natural resources, especially on Georgia's coast. The result will be a decline in the quality of life and lost opportunities related to it. Future costs of damage control will be great.

State Energy Strategy

Because state energy policy is disconnected from its relationships with critical natural resources (above all, water), Georgia leaders continue to support power generation that contradicts other important public objectives. This is partly because it's easier to keep doing things the way they've been done for decades. With relatively few power-generating corporations operating in the state, each seeking to maximize profits using conventional technology, energy conservation and 'green-energy' sources are given no significant support. Undoubtedly, fixation on water-intensive energy is strongly promoted by the political influence of Georgia Power Company, which employs seven lobbyists to help protect its stronghold on Georgia's energy markets.

And, by readily shifting the cost of new energy facilities onto consumers, the rules used by the Public Service Commission (PSC) for determining utility rates also have a tendency to propagate imprudent use of coal and nuclear power because they ensure investors will incur virtually no risk. Without thoughtful, objective consideration of alternative energy sources, Georgia's economic prospects will suffer as other states convert to renewable power.

Careful study of issues important to consumers and taxpayers would reveal that wind and solar energy cost much less per unit of energy produced than nuclear power, even when not including the significant cost of storing radioactive waste. Superficial analysis of coal as an energy source may make it seem cheaper, but the public costs of accommodating air emissions alone should disqualify coal from further consideration. Emission of carbon dioxide must be radically reduced to curb build-up of greenhouse gases if the worst consequences of global warming are to be avoided. But even if climate change were not the major issue it is, particulates emitted by coal plants would aggravate the growing problem of respiratory disease. Burning coal shifts added medical costs onto the public while reducing the quality of life for all those who breathe the air that it pollutes and eat the fish that it contaminates.

Despite the overwhelming implications of such factors, the 2007 Georgia Energy Strategy largely ignores them. The strategy's simplistic preoccupation with meeting projected demand by using more of the same water-intensive conventional energy sources, while marginalizing the potential of renewable, clean power, reflects a dangerously obsolete view of energy issues.

Fortunately, the state's neglect of critical facts and crucial trends are likely to be overcome by a combination of emerging markets and progressive federal policies that will better serve our citizens with renewable energy. Already Congress is proposing major incentives that promote clean power, and a large portion of the federal stimulus funding is aimed at implementing green energy.*

The question is whether these federal steps will take sufficient effect before Georgia energy markets are unwisely committed to supporting expansion of nuclear power at Plant Vogtle and construction of new coal-

powered plants. If the markets are prematurely dedicated to using conventional power sources, the economic feasibility of renewable energy in Georgia will be delayed.

If this happens, the timely use of cheaper and cleaner energy in other states is likely to attract promising new economic opportunities, and Georgia will be passed by.

*****_The Obama administration's $787 billion stimulus package includes $39 billion for the Department of Energy and $20 billion in tax incentives, all intended to promote clean energy._

Source, Associated Press, March 24, 2009.

Georgia Coastal Management Program

Over ten years ago, federal officials at NOAA approved Georgia's Coastal Management Program, authorized under the federal Coastal Zone Management Act. Using the options provided, Georgia elected to adopt a "networked" type of program, which required no new state authority, relying instead on a presumably better coordinated use of existing state authorities for protecting natural resources of concern. The coastal management jurisdiction was defined as an 11-county area, consisting of the six coastal counties plus five adjacent inland counties. Having a federally approved program qualified Georgia to receive an annual grant from the Office of Coastal Resources Management at the National Oceanic and Atmospheric Administration.

These annual grants average more than one million dollars a year, but under an agreement adopted by the Georgia Department of Natural Resources (DNR), which administers the program, a significant portion of those grants are made available in a competitive grant program for other governmental bodies, including cities, counties, and affiliates of the state university system.

Unfortunately, many of the federal dollars available for coastal management have been offset by reduced state funds that have been taken away by the Georgia legislature. As a result, rather than increasing protection of state coastal resources, federal funds have been used to shoulder many of the pre-existing state responsibilities. In fact, while the population of the coast and Georgia overall has grown more than 20%, DNR's share of the state's budget has decreased by more than 30%.

Also disappointing has been the program's failure to achieve the improved coordination of state regulations as intended in the networking approach. Data gathered by coastal resources staff is seldom used, and often not even known about, in other sections of DNR that make permitting decisions affecting coastal resources. At the time of this writing (March 2009), there is no evidence that Coastal Resources Division (CRD) intercedes in any formal way with the activities of the Environmental Protection Division (EPD) to boost the effectiveness of permit review or enforcement. Moreover, CRD staff has acknowledged problems in communicating with EPD. Such fundamental breakdowns prevent the realization of an effective well-coordinated coastal program. Likewise, to fulfill its aim to manage resources, CRD needs to have far better information about the consequences of its own decisions. Both the Marsh Protection Act and the Shore Protection Act are administered by CRD, yet there is no routine data-gathering effort to determine the actual impacts of permitted activities on resources of concern – fish, shellfish, and related resource conditions including water quality. Despite these deficiencies, the federal officials who evaluate state coastal management have approved Georgia's program in performance audits. This suggests serious problems with performance measurement at the federal level, which need to be resolved in the near future.

Land Conservation

Per capita spending on conservation by state

Source: du Moulin and Gray, *Conservation Almanac*, 2007 (Trust for Public Land)

Average annual per capita land conservation spending from 1998-2005. The average for eastern U.S. states was $6.49.

The above figure is from *Better Land Protection* in *Getting Greener,* a report issued by Center for a Better South in 2007.

Land conservation in the South is taking off. Any longtime resident knows that development has transformed the South, often for the better. But both this generation and those to follow next will need our natural infrastructure for recreation, clean water, natural industries and the dramatic beauty of functioning natural ecosystems.

There are more tools at our disposal than ever before to manage and protect these resources. With so much value to preserve, the South should take advantage of this opportunity to lead through steady state investment in conservation, assistance to local governments for conservation, and a favorable tax structure for voluntary private efforts.

Budgeting for a Sustainable Future

Georgia's per capita spending on conservation is not the lowest in the region but it is less than one-tenth of Florida's and about one-fifth of North Carolina's. If Georgia hopes to retain its quality of life in the face of continuing population growth, economic difficulties, and many other issues described in this analysis, our public officials must be willing to devote more funding to the care of natural resources and the vital services they provide.

Moreover, **Georgia has less than one third the recommended acreage of public parks per resident**. *(Source: National Association of State Park Directors)* With recent state budget cuts and continuing growth, this imbalance is likely to get worse.

Georgia also suffers from severely understaffed enforcement of state environmental regulations. In the budget just adopted for fiscal year 2010, there was an additional 25% cut in funding for these positions. Overall, **Georgia's environmental protection budget is less than half of what it should be, and it is declining in proportion to population.** As a result, environmental quality will continue to slump, producing adverse effects on Georgia's economy.

Note: The figures shown to the left and the text below are from *Getting Greener: Progressive environmental ideas for the American South* by Center for a Better South (2007)

Recommendations

- Every Southern state should boost dedicated revenue and bond funding for land conservation to at least $1 per person per month, and should maintain at least an acre of state parks for every 30 residents.

In Georgia, this recommendation would translate to an annual budget of more than $100 million for land conservation. That amount is equivalent to the current state-funded budget for all natural resource conservation and protection functions in the state.

- Southern states should provide incentives to encourage localities to implement strategic countywide land conservation plans.

Some coastal local governments in Georgia have adopted land conservation plans, but they all depend on external funding to be implemented. These plans were adopted under conservation programs set up under two different governor-sponsored programs.

- Southern states should emulate Virginia's encouragement of permanent private land conservation through state tax credits that enhance federal tax incentives for land preservation.

Land Conservation Conditions & Issues

- With more and more people moving into the South, the region's land resources are increasingly being threatened, developed or fragmented.
- Southern forests have the highest concentration of tree species diversity in the U.S. and their streams, rivers, bottomlands and swamps have the highest aquatic diversity in the continental U.S.
- But due to market conditions, private companies are starting to sell off large forest and watershed landholdings, which make them susceptible to development and threaten the South's land traditions.

  [In coastal Georgia thousands of acres of forested wetlands have been destroyed by conversion of drained forestland to tracts being marketed for development. Some of these losses are due to an inaccurate interpretation (by the Corps of Engineers) of a U.S. Supreme Court finding made in January 2001. Many of the areas surrounding these filled wetlands are now plagued by flooding and erosion. Please see section one above.]

- While private organizations are increasing the amount of Southern protected land, Southern states generally have a long way to go to protect land for an increasingly populous and more urbanized society.
- By increasing spending on land conservation through additional revenue streams, increased bonded indebtedness or other tools, Southern states can protect the traditional Southern link to special places.
- States also can partner with local governments in innovative ways to preserve land for future generations.
- States also can consider improving tax incentives for private landowners to protect more of their land.

Energy Use & Efficiency in Southern States

- Southern states are power hungry — Southerners have a higher per capita use of electrical power than people in any other region of the U.S. (*See the table below on carbon dioxide emissions by select states and nations*.)
- While Southern power rates are relatively low compared to the rest of the country, Southerners pay more in per capita annual spending on power than most other Americans – because they use so much more electricity.
- Because the cost of power has been relatively inexpensive, Southern states haven't pushed to generate energy savings. In fact, they've been clinging to outmoded ways of generating power. Now is the time for the South's energy policies to mature.
- But if states would focus on reducing energy consumption, such as by adopting stronger appliance efficiency standards, residents would save money and cut pollution. Adopting such standards in the South would save as much energy as that supplied by 10 average power plants.
- Additionally, states could focus on new strategies to save energy. One example is use of a Public Benefits Fund, which would allow states to pool a small portion of consumer utility bills into a fund to reward energy efficiencies, generate more renewable energy and provide low-income energy assistance.
- States could also emphasize renewable energy by requiring utilities to get an increasing share of its energy from renewable sources.
- Such renewable energy requirements would work in the South, which generally hasn't tapped into major resources of wind, solar and other types of renewable energy. By using these sources of energy, the South wouldn't have to build as many power plants, which would cut future pollution in a big way.
- Like state governments, local governments can get into the act by adopting energy standards and efficiencies, and by focusing on renewable energy strategies.

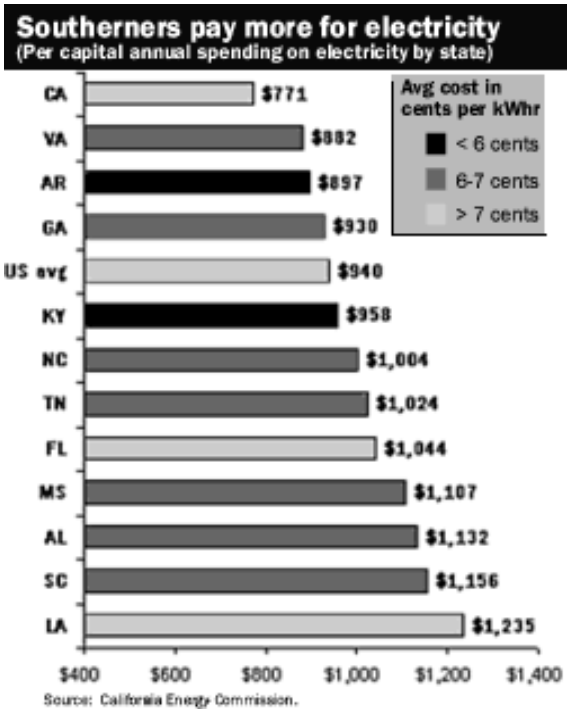
World's top CO_2 emitters

(Each U.S. state is treated as a country)

Rank	Nation/State	CO2*
1	China	3451.6
2	Russian Federation	1544.1
3	Japan	1220.9
6	Texas	759.8
10	California	463.2
26	**Florida**	266.0
32	**Louisiana**	199.4
34	Netherlands	179.8
35	**Georgia**	178.2
36	**Kentucky**	169.7
37	**North Carolina**	167.8
39	**Alabama**	159.0
40	Kazakhstan	149.9
41	**Tennessee**	143.6
42	Venezuela	142.9
43	**Virginia**	141.4
65	**South Carolina**	88.1
66	Nigeria	85.7
70	**Arkansas**	81.7
71	**Mississippi**	81.1
72	Philippines	74.1
73	Korea (North)	73.8
77	Austria	69.0
	United States of America (50 states)	5728.3
	European Union (25 countries)	3927.6

Source: Climate Analysis Indicators Tool at World Resources Institute, 2001

* *Millions of tons*



Energy Use & Efficiency in Southern States, continued

Recommendations

- Each Southern state should create a **Public Benefits Fund** that invests 2 percent to 3 percent of utility bill charges into strategies that boost energy efficiency, generate more renewable energy and provide low-income energy assistance.
- Adopt energy-efficient appliance standards so consumers aren't forced to buy outdated technology.
- Southern states should set a "Renewable Energy Standard" that requires utilities to get an increasing share of energy from renewable sources.

Source: *Getting Greener: Progressive environmental ideas for the American South*, Center for a Better South (2007)

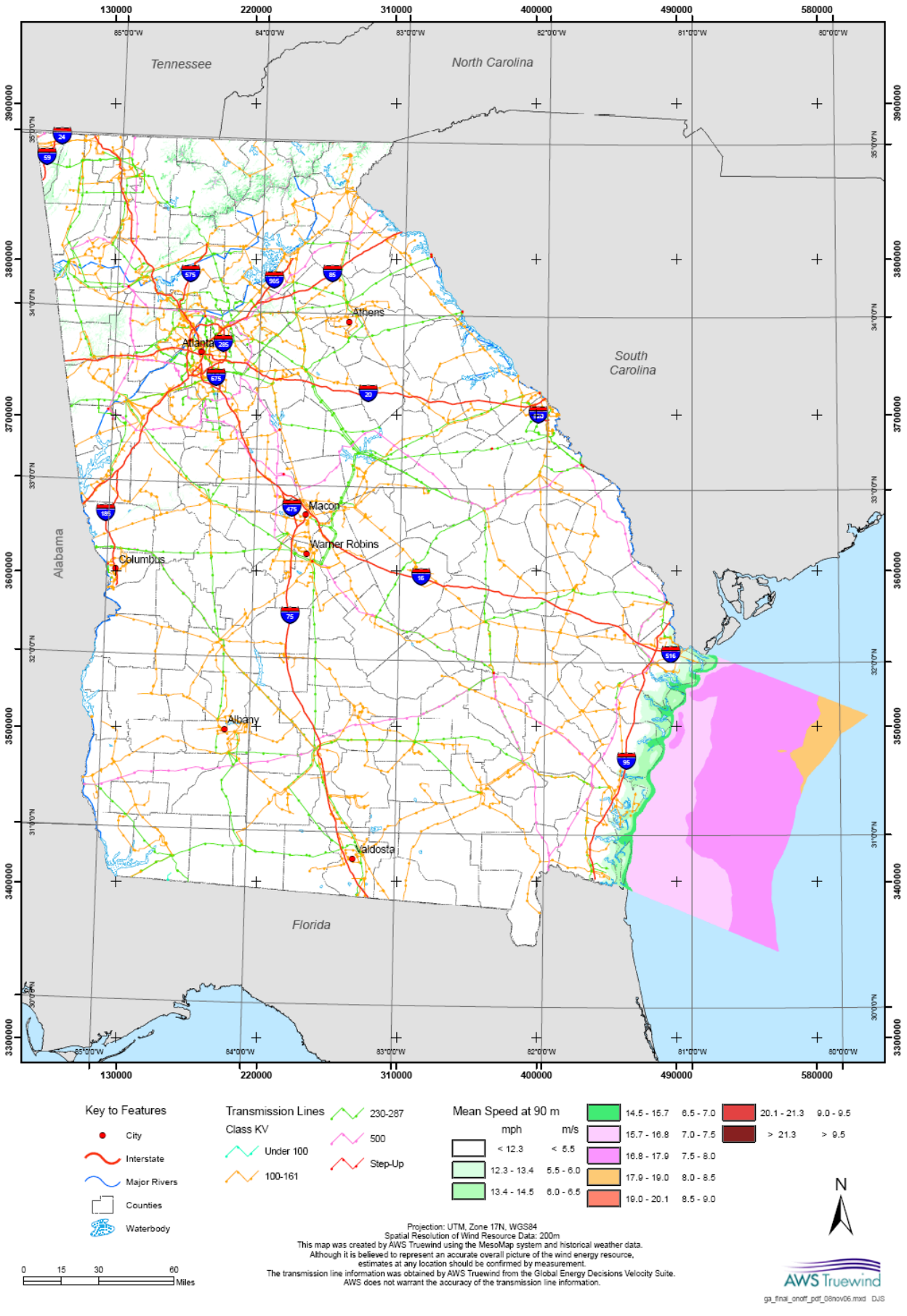
As this chart shows, most Southerners pay more per year for energy per capita -- even though their rates are relatively low. Bottom line: Southerners have a lot of capacity to realize savings through efficiencies and other measures.

Source: Getting Greener: Progressive environmental ideas for the American South, Center for a Better South (2007)

IMPORTANT NOTE: Although Georgia's annual per capita energy costs compare favorably on this chart, this ranking is like to change significantly. In the current session of the General Assembly (2009) a bill was passed allowing a rate increase to be imposed on Georgia Power's residential customers to cover financial costs incurred by the company in doubling the capacity of Plant Vogtle. The approved measure will enable Georgia Power to collect as much as needed (in advance) from residential energy users to cover all costs associated with the project, initially estimated at $14 billion, plus interest fees. Because the plant is nuclear powered, actual costs will almost certainly be far higher. Cost overruns of past nuclear facilities have been enormous. It's probable that if this expansion is built, total cost will be at least double the original estimate, and residential utility rates will rise accordingly.

See table comparing nuclear energy with solar and wind.

Wind Resource of Georgia, Mean Annual Wind Speed at 90 Meters



Appendix

EPA Establishes Mandatory Greenhouse Gas Reporting
By David Rich on March 12, 2009
World Resources Institute

The EPA is creating a nationwide database of greenhouse gas emissions, an important first step on the path to reducing U.S. emissions.

The Environmental Protection Agency released a proposed "Mandatory Greenhouse Gas Reporting Rule" for sixty days of public comment, with a final rule expected in late 2009. The proposal would cover 85 to 90 percent of US greenhouse gas emissions. This process is the result of legislation passed in December, 2007 that directed the EPA to design a national, mandatory GHG emissions registry. EPA's work on a national registry lagged under the previous administration, but has received fast-track priority under incoming Administrator Lisa Jackson.

The plan would require 13,000 facilities to report their emissions. Facilities that emit 25,000 metric tons of greenhouse gases annually would be covered, and small businesses will be exempt. Reporting for sectors such as the utilities, oil and gas producers, and chemical refineries would start in 2011, while automobile manufacturers will start up on their 2011 models.

A national greenhouse gas registry is a major development in U.S. climate change policy, because it is the cornerstone of cap-and-trade, or indeed, any policy to measure and reduce emissions. Before the government can implement emission reduction policies, they first need to have solid and reliable emissions data. Otherwise, there would be no way to ensure that emissions sources—such as power plants and factories—are achieving reductions.

The EPA previously had no comprehensive way to track emissions data at the individual facility or business level. An EPA national registry will provide transparency and support a variety of climate change policies and programs at the national, regional, state, and local levels.

Unlike voluntary programs like the Climate Registry and Climate Leaders, which allow companies to demonstrate progress in reducing emissions across their entire business, the new federal reporting program will track the emissions of individual facilities, rather than companies as a whole. Also, reporting from those facilities will be mandatory, not voluntary.

A comprehensive GHG registry isn't just good for the sake of policy, it's good for business as well. Experience with voluntary programs shows that as companies measure their emissions, they typically gain a better understanding of where they are coming from, for instance, their supply chain, transportation, or in their electricity, heating, or cooling use. That knowledge helps identify cost-effective, even "no regrets" strategies for reducing their carbon emissions and improving their bottom line by saving energy.

Intergovernmental Panel on Climate Change

June 2008

Implications for policy and sustainable development

Coastal systems and low-lying areas

Sea-level rise will extend areas of salinization of groundwater and estuaries, resulting in a decrease in freshwater availability. **Settlements in low-lying coastal areas that have low adaptive capacity and/or high exposure are at increased risk from floods and sea-level rise**. Such areas include river deltas, especially Asian mega-deltas (e.g., the Ganges-Brahmaputra in Bangladesh and west Bengal), and lowlying coastal urban areas, especially areas prone to naturalor human-induced subsidence and tropical storm landfall (e.g., New Orleans, Shanghai).

Industry, settlement and society
Infrastructure, such as urban water supply systems, is vulnerable, especially in coastal areas, to sea-level rise and reduced regional precipitation. Projected increases in extreme precipitation events have important implications for infrastructure: design of storm drainage, road culverts and bridges, levees and flood control works, including sizing of flood control detention reservoirs. **Planning regulations can be used to prevent development in high-flood-risk zones (e.g., on floodplains), including housing, industrial development and siting of landfill sites etc. Infrastructure development, with its long lead times and large investments, would benefit from incorporating climate-change information**.

From *Getting Greener – Better Land Protection*
(Center for a Better South, 2007)

Economic growth and development have made welcome incursions in the South's historic poverty, and have fulfilled the dreams of many people who left farms and small towns to find prosperity. Yet, even life lived apart from the land depends upon its natural ecosystems. Human activity has constantly transformed the Southern landscape, whether by deforestation, fire suppression, drainage of swamps, the farming practices that eroded topsoils and exposed the red clays of the piedmont, or the managed reforestation of the 20th century. The next

phase of Southern land management should promote and preserve for future generations functioning natural ecosystems that also support human health, recreation and economic value.

Southern states make up five of the six states with the fewest state park acres per person in the U.S. Georgia, Louisiana, Mississippi and Virginia have less than one acre of state park for every 100 residents.

[According to the Annual Information Exchange produced by the National Association of State Parks Directors, in 2006 Georgia had almost 108 persons per acre of park land, meaning that Georgia has one-third the area of recommended public park space.]

Amory Lovins: Expanding Nuclear Power makes climate change worse

"What nuclear would do is displace coal, our most abundant domestic fuel. And this sounds good for climate, but actually, expanding nuclear makes climate change worse, for a very simple reason. Nuclear is incredibly expensive. The costs have just stood up on end lately. *Wall Street Journal* recently reported that they're about two to four times the cost that the industry was talking about just a year ago. And the result of that is that if you buy more nuclear plants, you're going to get about two to ten times less climate solution per dollar, and you'll get it about twenty to forty times slower, than if you buy instead the cheaper, faster stuff that is walloping nuclear and coal and gas, all kinds of central plans, in the marketplace. And those competitors are efficient use of electricity and what's called micropower, which is both renewables, except big hydro, and making electricity and heat together, in fact, recent buildings, which takes about half of the money, fuel and carbon of making them separately, as we normally do.

"So, nuclear cannot actually deliver the climate or the security benefits claimed for it. It's unrelated to oil. And it's grossly uneconomic, which means the nuclear revival that we often hear about is not actually happening. It's a very carefully fabricated illusion. And the reason it isn't happening is there are no buyers. That is, Wall Street is not putting a penny of private capital into the industry, despite 100-plus percent subsidies."

(Source: Interview by Amy Goodman in *Democracy Now*, July 16, 2008)

Recommendation for Stakeholder Evaluation Group position on Corps use of study committee reports and other information in preparing the General Reevaluation Report (GRR), Mitigation Plan, and draft EIS for the Savannah Harbor Expansion Project.

(Prepared by the Center for a Sustainable Coast, adopted by the Stakeholder Evaluation Group, July 2008., and recommended to the Corps of Engineers by Georgia Ports Authority)

The SEG recommends that the Corps incorporate into their analysis of the project the reports from the various study committees, recognizing that these may be incomplete or inaccurate. To ensure the most accurate and comprehensive use of information by the Corps in further analysis of the project's impacts, mitigation alternatives and their impacts as well, we recommend the following standards of review.

1. **Degree of risk and uncertainty**.

To determine the usefulness of project analysis, decision-makers (including the public) must have reliable advice about the certainty/uncertainty of the assessment of impacts and mitigation alternatives. Likewise, implications about any uncertainty must be clarified. If risk is determined to be significant, contingencies for quickly responding to impacts must be provided so that unforeseen adverse consequences will be minimized. *This should include specification of all assured sources of funding that will be available to cover the costs of any previously unforeseen corrective actions or compensation for cost overruns that may need to be pursued to protect public resources.*

2. **Systemic Implications**.

Due to the complex and interactive nature of the natural systems affected by the project, impacts on one resource or group of resources may have consequences for others, either short-term or long-term. Studies focusing on one resource (e.g., striped bass) may be complete and accurate on one level, but may have implications for other resources – such as species or habitats of concern. The same can be said for mitigation efforts – a reasonable mitigation alternative for controlling or compensating for one kind of adverse impact for a resource of immediate concern may itself produce undesired effects on other resources. Such systemic and interactive effects must be clearly explained and fully evaluated when analyzing the project's impacts and mitigation

measures that are based on a comprehensive list of individual issues or resources. As with the case of uncertainty, contingencies for intervening to prevent significant but unforeseen systemic impacts must be well planned and thoroughly described as part of the Corps analysis and mitigation plan.

3. **Metrics & methods for evaluating impacts**.

Whatever studies or recommendations are adopted, including those augmented by additional Corps analysis, Corps reporting must specify carefully considered methods for monitoring and evaluating the impacts of both the project and mitigation efforts. These methods must specify in detail the protocol for gathering and assessing information, and the criteria to be used to trigger enactment of contingency plans for controlling adverse effects if and when they arise. Contingency procedures should include the use of more rigorous monitoring and assessment methods to assist in determining the causes of undesired impacts and the alternatives for reducing or eliminating them. Such procedures must also include the option of stopping project implementation activities for an indeterminate period to prevent unacceptable impacts from occurring. In any case, project analysis and recommendations must specify the threshold of conditions that must be ensured to enable the project to remain feasible in the public interest. If these conditions cannot be maintained, procedures must be clearly outlined for intervening to prevent the project or its mitigation from causing further damage to public resources.

Stormwater Effluent Guidelines

Instead of strengthening the regulation of this significant pollutant source, the EPA has adopted a weakened approach. As the result of a 1992 consent decree with the Natural Resources Defense Council, the EPA proposed revised stormwater guidelines for the construction and development industry in June 2002. These guidelines were the end result of the OMB's gutting of EPA's original draft proposal. The revised rules no longer require state-of-the-art technologies to reduce toxic pollutants. They also removed minimum standards for best management practices, discharge limits, discharge monitoring, performance levels and pollution prevention. In addition, the EPA redefined the term "new source" in the regulations to exclude new construction and development projects. In conjunction with the Natural Resources Defense Council, Waterkeeper Alliance commented on these proposed regulations. These comments argued that the EPA should use the highest levels of pollutant control required by the Clean Water Act for each category of pollutant. Specifically, it was argued that toxic and non-conventional pollutants should be controlled at the level of best available technology (BAT); that conventional pollutants discharge should be controlled by the use of best conventional control technology (BCT); and that new source standards should be applied to new construction and development projects. The EPA was scheduled to take final action on the proposed rules in March 2004. When EPA failed to do so, Waterkeeper Alliance and NRDC, in July 2004, submitted a 60-day notice of our intent to file suit against EPA.

[Source: WaterKeeper Alliance, July 14, 2004.]

Savannah River Basin Initiative

Several environmental organizations are collaborating to bring reliable environmental management and planning throughout the Savannah River watershed, which is shared by growing populations in South Carolina and Georgia. They believe this will be made possible by combining the use of information to account for interactive and cumulative project impacts on water supply, water quality, fisheries, and other aspects of public interest, including health.

Among these projects are the Savannah harbor and channel deepening, the liquefied natural gas (LNG) facility at Elba Island, proposed doubling of nuclear energy produced at Plant Vogtle near Augusta, the construction of a new port across from Savannah in Jasper County, South Carolina, development of the floodplains, and the prospect of water being removed from the Savannah River to supply the needs of other watersheds, including those in Atlanta.

The SRBI proposes a new public program committed to bringing responsible management to the Savannah River Basin (SRB). The SRB encompasses the entire Savannah River watershed, from its source in the mountains of Georgia the Carolinas to Tybee Island, and throughout its 10,577 square-mile drainage area.

As part of their proposal, SRBI proponents advocate a two-state agreement between Georgia and South Carolina that would include a wide-ranging program of analysis, planning, and resource management. Under this approach, the needs and sustainable capacity of the entire Savannah River Basin would be reconciled through science-based decision-making and shared accountability.

"12 Actions for Change" prompted by lessons learned from Hurricane Katrina

Article in *Engineer Update*, September 2006

Coastal water quality on downhill slide – Press release dated July 7, 2005 describing the research findings of Dr. Peter Verity, research scientist at Skidaway Institute of Oceanography.

Wind-Power Politics – Article from New York Times by Mark Svenvold, published September 14, 3008.

Sustainability Indicators for Coastal Georgia – A report by the Center for a Sustainable Coast (June 2007). Can be downloaded at www.sustainablecoast.org.

Comments on Real Estate Development as Primary Factor in State Economy

"…That [real-estate development] approach to economic development [in Georgia] is basically a Ponzi scheme in that **the state relies on a steady stream of newcomers to fund services for the people who're already there**. A recent article about California makes the same point: "**The real estate industry is bumping up against the limits of population growth and exurban sprawl. And state and local governments that have long financed themselves by pushing costs off and into the future have finally met their day of reckoning.**

"This has produced in Georgia a Potemkin village economy sold to the 'low information' voters out there by the mantra of 'small government and low taxes.' As long as the newcomers keep pouring in, governing the state is pretty much a no-brainer. You don't have to worry much about education, healthcare, infrastructure, high paying jobs, etc.

Quote by Leon Galis, retired university professor, in personal correspondence, approved for publication.

Coastal and Marine Ecosystems & Global Climate Change: Potential Effects on U.S. Resources

Prepared for the Pew Center on Global Climate Change, August 2002

Technical Sources

Stormwater Effluent Guidelines

Stormwater runoff is a major source of pollution in our rivers, streams and oceans. Runoff contains a host of contaminants, including sediment, metals, pesticides, fertilizers, automotive oil and grease, excessive nitrogen and phosphorous, bacteria and viruses, and trash. These contaminants are dangerous to both human and environmental health. Pollution from stormwater sources is the largest known cause of beach closures and shellfish contamination. EPA estimates that construction sites annually discharge 80 million tons of solids into waterways and **the problem is getting worse as development increases around the United States**.

Green Growth Guidelines: *A low Impact Development Strategy for Coastal Georgia,* prepared by the Coastal Georgia Regional Development Center and EMC Engineering Services, Inc. under a grant from the Georgia Coastal Management Program. (April 2006)

Coastal Riparian Buffer Guidance Manual, *A companion to the Model Coastal Buffer Ordinance* (January 2007). Prepared by the River Basin Center of the University of Georgia.

Coastal Stormwater Supplement to the Georgia Stormwater Management Manual (Draft 2), October 2008. (Center for Watershed Protection)