The paucity of research articles by geographers on the political and planning aspects of the marine environment is evident from review of the geographical literature. It is undoubtedly true that there are some geographers who are involved at all levels of policy making in this region, but the fruits of their efforts have not been made available to a professional audience — fifteen articles in three major U.S. geographical journals in the past 16 years is not very commendable.

Since 1958 (the year of the first Geneva Law of the Sea Conference), only five articles have appeared in the *Annals* which relate to policy making in the marine region. Three of the articles focussed on the international law of sea issues\(^1,2,3\), while land use on the coastal region of the Great Lakes was the topic of one article.\(^4\) Minghi mentioned offshore boundaries only in the context of an overall discussion on types of political boundaries.\(^5\)

During this same period, only seven articles appeared in the *Professional Geographer* which focused on marine oriented issues. An attempt was made by Falick\(^6\) and Padgett\(^7\) to call attention to the varied research possibilities of the marine region which had been neglected by the profession. Haynes\(^8\) and White\(^9\) touched upon subjects which will be of increasing importance to U.S. policymakers: the Alaskan north slope oil and environ-
mental impact statements. In one PG article, Eyre focused on an interna-
tional maritime boundary dispute10, while DeVorsey illustrated how an
historical geographer could apply his
skills to aid the courts in settling a
state-federal maritime jurisdictional
problem.11 In a more recent issue of
the PG, Craig discussed the Latin
American attitude toward the law of
the sea.12

In this 16-year period, three marine-
related articles appeared in the Geog-
raphical Review. They concentrated
on regional uses of the seas: the
North Sea and its fuel resource poten-
tial13, Soviet fishing in the Barent
Sea and the Atlantic14, and the sea fish-
eries of southern U.S.15 An offshore
geography study by Alexander pub-
lished as a part of the AAG Mono-
graph Series in 196316 did not stim-
ulate geographers' interest in the
marine area. The intent of this paper
is to point out some issues involved
in the internation law of the sea and
in the U.S. coastal zone which lend
themselves to innovative contribu-
tions by the geographer. The term
marine environment, in the context of
U.S. studies, refers to the offshore
waters of the Atlantic, Pacific, Gulf
Coast, and the Great Lake and to the
coastal lands which are being sub-
jected to federal and state legislation.

Law of the Sea Issues

Except for the work done by the
geographers already cited, very little
has been done by geographers on law
of the sea issues. Hodgson, of the U.S.
State Department, has made im-
portant contributions in the field of
marine geography, especially his
maritime boundary study series.17,18
Glassner19 and Smith20 have written
on two controversial law of the sea
issues: access to the sea for develop-
ing landlocked states and the impact
of international straits on petroleum
transit.

With the third session of the Third
United Nations Conference on the
Law of the Sea approaching in spring,
1975 in Geneva, the issues to which
geographers can apply their research
skills are both timely and numerous.
In addition to controversies over 1) pas-
 sage through international straits and
2) rights of landlocked countries
to marine resources, other critical
questions to be debated at the con-
ference are 3) limits of territorial sea,
4) management of marine fisheries, 5)
extension of national jurisdiction over
living and nonliving resources within
an economic zone of 200 miles, and
6) the establishment of an Interna-
tional Authority for the mining of
seabed minerals in the area beyond
limits of national jurisdiction.

In his article seven years ago, Alex-
ander suggested a possible starting
point for geographic analysis of any
law of the sea issue: "The geog-
rapher's approach to the study of the law
of the sea may properly commence
with an analysis of how individual
countries are oriented toward the sea:
what uses they make of the marine
environment, what the prevailing at-
titudes of their people are toward the
sea, and what commitments they
have in terms of investment in the sea
and economic dependence upon it.
On the basis of orientation the geog-
rapher can then turn to a study of the
political and legal controls exercised
by the country over the sea."21

A country's use of the sea would
depend on many things, such as
marine resource availability and ac-
cessibility, which, in turn, would de-
pend on such factors as length and
nature of the coastline and ocean
floor and on the level of science and
technology within a country. A state's
perceived need of marine resources
would affect its maritime policy and
the types of international controls it would advocate. Although many of the developing countries presently do not have the technology to exploit the resources within their marine jurisdiction, they are becoming very opposed to anyone else getting the large profits from these resources.

The major types of controls in the oceans involve the six questions listed above. Of particular concern to the geographer are 1) the distribution of these controls — where are these jurisdictional zones and how do they relate to each other? 2) the impact of these control zones on all types of activities occurring in that area — what impact would a 200-mile territorial sea have upon international oceanborne transit? and 3) what types of zones would best meet the goals and needs of the international community?

Although the goals and needs require clarification, it seems that the overall goals of an international agreement on the law of the sea are to maintain world order in the marine region, to maximize the efficient and wise use of marine resources and marine space, and to distribute these resources to all countries based on international agreement. A major conflict facing the Law of the Sea Conference is "between a minority of nations who hold out for the basic 'freedom of the seas' and for limited and fragmented international and national regimes, on the one hand, and, on the other, a majority of nations, who have stepped forward in favor of a strong and rational regime for the oceans, the management of which would be shared by coastal nations, regional organizations, and the International Authority."

A large research area is analysis of how the marine resources (fish, the minerals of the seabed and subsoil, and marine space) would be distributed among the world community under different proposed regulatory schemes. This type of an analysis would first require a knowledge of the location of the resources and their accessibility to the controlling countries. The physical geography of the ocean floor, such as the location and extent of the continental shelf, may result in a nonequitable distribution of some marine minerals. Some proposals have considered this and have offered formulas involving depth and/or distance limits to a country's jurisdiction over its offshore resources. In congested areas, such as in international straits, there exists a conflict over the use of marine space for such local fishing, local and international transit, and mineral exploration and exploitation.

The world marine environment does not possess uniform characteristics and this is perhaps the major problem facing the international treaty-makers. Among the many proposed regulatory schemes are those which advocate regional organizations. It would be a challenge to devise a comprehensive and workable classification of the world marine regions. Such elements as the geology of the ocean floor, ocean currents, existing trade routes, location and migration of different fish species, mineral resource potential, and coastlines, to name only a few, would be variables included in the formation of the regional identity. To analyze a wide number of elements such as the ones listed above and to regionalize the marine environment is not an easy task. As Berry points out, "the understanding of regional character presumes an analysis of spatial associations, simplified because it is undertaken for a relatively small number of places, but complicated because it must be defined for many
variables." This is the type of information and analysis, however, which would be useful to the international decision-makers and which the geographer could provide. The same techniques used at the international level could apply to regionalizing the U.S. marine environment and provide a basis for a regional approach to coastal zone management.

**Coastal Zone Issues**

It is only in recent years that U.S. decision-makers have perceived a need to enact legislation to control certain activities in the coastal zone. Massachusetts, in 1965, was the first state to institute a statewide wetlands protection program which was designed to regulate dredging, filling, or other alternatives of the coastal wetlands. Since 1965, other coastal states have passed bills regulating, to various extents, activities in their coastal region.

Prior to the late 1960's, there appears to have been a general unawareness of the importance of coastal areas and of the damage done to them. This lack of knowledge about the vital role of the coastal zone in man's activities prompted many studies at both the federal and state level. It was reported that between 1922 and 1954 approximately two million acres of coastal marsh and estuarine habitat were lost, accounting for 25 percent of all such areas in the United States. Since 1954, there undoubtedly has been more destruction in the coastal region resulting from activities such as dredging, filling, and waste disposal.

In its Tidal Wetlands Act of 1973, New York legislators gave a succinct listing of many values of the coastal zone, stating, in part:

"Among the many and multiple values of such wetlands are the following:

- marine food production—tidal wetlands are an essential area of retention, conversion, and availability of nutrients for crustacean and shellfish; they are the nursery ground and sanctuary for many fin fish; they sustain microscopic marine organism and vegetation which are essential to other food chains.
- wildlife habitat—
- flood and storm control—tidal wetlands are valuable and provide essential and irreplaceable protection in both flood and storm or hurricane weather conditions.
- recreation—
- treating pollution—tidal wetlands serve as an invaluable and irreplaceable biological and chemical oxidation basin in which organic run-off and organic pollution are oxidized, metabolized and converted into useful nutrients.
- sedimentation—tidal wetlands are an essential settling and filtering basin, absorbing silt and organic matter which otherwise would obstruct channels and harbors to the detriment of navigation.
- education and research—
- open space and aesthetic appreciation—tidal wetlands comprise a large part of the remaining natural and unspoiled areas along the crowded coastal reaches of the state."
area where the land and sea environments merge, there is no general agreement on its exact boundaries. Depending on the type of legislation, several terms have been given to parts of the coastal region; those most frequently used in state statutes are tidelands, tidal wetlands, estuarine areas, and tidal marshland. Tidelands are the lands lying between the mean high tide and mean low tide lines. The tidal wetlands generally mean "any bank, marsh, swamp, meadow, flat, or low land subject to tidal action or coastal storm flowage." Estuarine areas have been defined as including "all tidally influenced waters, marshes, and marshlands lying within a tide elevation range from 5 and 6/10 feet above mean high tide level and below." Tidal marshlands are defined by North Carolina as "any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial watercourse), provided this shall not include hurricane or those areas upon which grow some, but not necessarily all, of the following salt marsh plant species" — [list of species].

Review of the coastal states' statutes reveals a great variation in the boundary delimitation of the coastal zone. Generally, the seaward definition of the states' coastal zones are identical. The Submerged Lands Act of 1953 granted to coastal states "title and ownership of the lands beneath navigable waters within the boundaries of the respective states," which was confirmed as a line three geographical miles distant from the respective states' coastline. Due to historical considerations, Texas and Florida have their seaward boundaries placed at three marine leagues (nine miles). With the probable extention of U.S. limits on the seafloor resulting from the upcoming international law of the sea conference, it will be interesting to see if the states attempt to extend their jurisdiction as well.

The variation among the states coastal definition occur in the landward boundary. In states which define 'coastal marshlands' (Georgia), 'coastal wetlands' (Maine, Mass., N.J., N.C., R.I., and Wash.) or 'tidal wetlands' (N.Y.), the definitions are fairly similar. Most of them are based on physical phenomena (such as those areas affected by tidal action) and on the type of vegetation which grows or is capable of growing in the region.

California and Louisiana have presented unique standards to the landward coastal zone delimitation scheme. California's criteria for the landward extent of its coastal zone is based on 1) topography—"highest elevation of the nearest coastal mountain range," and 2) distance in three of its counties—"five miles from the mean high tide line." Louisiana, which has perhaps the most conceptually far reaching management act in the country defines the landward portion of the coastal zone as extending inland to the landward extent of marine influence. "The term 'landward extent of marine influence' means the area extending landward from the high water mark which in contemplation of human activities and natural ecology may be considered to come under the influence of the adjacent sea." This definition of the landward boundary partially based on the maritime influence on human activities does not appear in other state statutes, yet it must be considered if the ultimate goal is to manage man's activities in this region. A major problem is to spatially measure this "landward extent of marine influence." There are probably advantages and disadvantages to each criteria.
California, for example, has a mountain range which is proximate to the coast and conveniently runs parallel to it. Where the mountains are farther from the coast (in the three counties of Southern California), the legislators have put in a distance criterion. A question a geographer should raise is why five miles? Ease of recognition has prompted some states to use existing political boundaries, such as the use of coastal counties in North Carolina, as the basis for delimiting the coastal zone.

In their report on proposed coastal zone management systems, the National Commission on Marine Science, Engineering, and Resources recommended that each coastal state "be authorized to define the landward extent of its coastal zone for itself."34 Given the fact that each state has unique geographical features and its own management problems, it would be detrimental to the planning and managing of this region to set down in specific terms the area to be called the 'coastal zone'. What is needed is not a set definition of 'coastal zone' but a model which includes criteria by which each coastal state could establish its own delimitation of this region. The criteria in the model would include physical, economical, political, social, and legal considerations. The landward boundaries should have as its underlying criterion the idea of the influence of the sea and the marine environment upon man's activities.

A major political consideration affecting the boundary delimitation is the question of who has the authority over the management of the coastal region. Most of the laws which governed the management and use of the coastal region have been ineffective and inadequate. One lawyer summed up the situation: "Authority over the coastal zone environment is presently divided among many different agencies of the federal, state, and local governments. Typically, agents and units of government exercise authority that is limited both geographically and substantively. The natural consequence of this fragmented pattern of control is a lack of coordination in government decision-making and ignorance of the significance and complexity of coastal zone problems."35

Although some states have nominally organized regions for planning purposes, regulatory authority has remained with the state, which, in many cases, has allowed local governments to regulate their own development. With local control over development in the coastal zone, a comprehensive planning perspective for the entire coastal region is impossible. It is felt that a coastal regional authority governing the entire coastal zone in a state (or possibly an interstate coastal authority) would be the most effective means to manage wise utilization and growth of this fragile environment.

The potential contributions of the geographer in the field of coastal zone management are many and varied. The whole realm of boundary delimitation needs new approaches and methods. In considering the coastal zone boundaries, one must consider population growth and urbanization, land and water use, recreation needs, transportation networks, and the possibility of a super-port or an oil refinery locating offshore. The coastal lands and waters have been recognized as a valuable resource in need of orderly, balanced utilization, and preservation which can no longer afford to be regulated in piecemeal fashion. The coastal zone must be delimited and managed in a more comprehensive and rational
way; it must be viewed as a region with distinct qualities.

(20) Smith, Robert W. "Oceangoing Shipment of Petroleum and the Impact of Straits on VLCC Transit," Maritime Studies and Management (October, 1973), 119-130.
(33) IRS §§51-1361(C) [added by Acts No. 35 §1, 1971].