River Discharge
FIG. 4-1. Watersheds of the northern Gulf estuaries. The numbering system is consistent across all figures throughout this book.
The best of all systems would have multiple monitoring locations, including the discharge location(s) of the river where it enters a bay or estuary and, if identifiable, the point of entry to the Gulf. The monitoring system should to ring the Gulf of Mexico estuaries. To ascertain the impact of the discharge in the offshore Gulf, surveys using automated underwater vehicles, e.g., gliders, instrumented for measuring water quality parameters and currents would be needed. These surveys should be done at appropriate times to capture the effects of mean, high, and low discharge conditions. These data would be useful for assessing the habitat environmental conditions and effects on living resources and the distribution of constituents in the estuarine and offshore waters.

The initial basic system would build from existing resources: USGS and COE gauges and State water quality data. At minimum, rivers would be monitored at the head of the estuary and the Gulf of Mexico where initial measurements show a dramatic decrease in salinity. This decrease would be identified in preliminary measurements.
Key parameters to be measured:
• Volume of freshwater,
• Flow rate (velocity),
• Water level,
• pH,
• Salinity,
• Nitrogen,
• Phosphorous,
• Suspended sediments,
• Selected contaminants of concern, if any, at specific locations.
Supplemental parameters to be measured:
• Dissolved oxygen,
• Chlorophyll-a,
• Temperature,
• Other nutrients,
• Trace metals,
• Phytoplankton species,
• Pathogens
Assumptions 1

A. Research into the impact of the discharge of the Mississippi-Atchafalaya River System or other rivers on the environment of the Gulf coastal ocean are not covered by this plan. However, the elements of this plan are considered to be a foundation of measurements within which more detailed measurements, specific to the research question being addressed, would be made by the researchers with appropriate funding agencies.

B. Table 1 lists the ~55 rivers that discharge into the bays, estuaries, and coastal ocean of the Gulf of Mexico and that have been or are being monitored by USGS and ACOE. The priority rivers of interest for the GCOOS are given.

C. We will depend upon the USGS, ACOE, and State agencies to install, operate, and maintain the discharge gauges and water quality measurements.
Assumptions 2

• D. For the high (H) and medium (M) priority rivers, we will request that the USGS, ACOE, or State agencies add monitoring capability for missing key parameters.

• E. We will request from USGS and ACOE the addition, as necessary, of gauges at rivers of interest that are not instrumented, (2) real-time transmission capability on selected rivers if not already installed, and (3) instrumentation to measure missing key parameters.

• F. We will seek to maintain the water quality monitoring sites of NGOs or small station operators on selected rivers that yet are to be identified.
To assess impacts of river discharge on the Gulf environment, we will depend on the mooring and glider plans to measure the key parameters in the Gulf to match those measured on the rivers.

The GCOOS-RA will:

1. make the current and historical river data readily available in useable format,
2. actively support the agencies collecting the data in their efforts to keep their budgets intact and to expand their networks if necessary,
3. make the mooring and glider data readily available in useable format, and
4. make products for the E/O community and the public.
• The GCOOS Data Portal will provide access to the data through links to the data sources and through reformatting for modelers or to generate public products. This will require approximately 1/4 FTE at a cost of $25,000 per year.

• Additionally, we anticipate that there will be 10 water quality systems on rivers that are supported by NGOs and others (see Appendix A). These entities will be provided with some support to keep instruments operational. They also will be provided occasional funds to install new systems (approximately 2 per year @ $25,000 each). We assume a cost of $15,000 per entity per year based on information from an existing NGO. We assume a cost of $25,000 per year (for 1/4 FTE) for 5 entities to provide state-wide integration of small data providers.