State agencies need individuals that can enter an organization, identify appropriate applications of GIS, and work within that organization to integrate the technology. There are four primary areas that GIS professionals can contribute significantly.

1) Data Management
   Good data management practices are critical to create an environment that directly supports decision-making. Specifically, incoming professional should be skilled in:
   - data documentation
   - effective data modeling and database design
   - logical naming conventions
   - structured backups.

2) Data Collection/Integration
   Time and effort is commonly lost either duplicating existing data or trying to adapt inappropriate data. It is important to understand:
   - existing data resources and their reasonable use
   - how to locate data, assess it for use, access the information, and integrate information effectively.

3) Data Sharing/Distribution
   Data development is increasingly focused on shared or confederated data. The UCGIS ‘Virtual GIS Seminar’ is an excellent example of sharing information across space and theme. In that spirit, students must be knowledgeable with regard to:
   - data standards including OGIS, FGDC, ISO
   - sharing of data and ideas via the world wide web and organizational ftp sites.

4) Professional Integration
   GIS staff must interact strongly with related professionals and learn to build upon existing personnel and resources. This is important for morale and for the construction of effective applications. Training must support integration by:
   - instructing students in the development of tools and techniques that enable existing personnel and disciplinary experts to directly contribute (EXAMPLES design of user interfaces, participation on design teams, establishment of performance criteria)
   - either opening doors to Geography courses or facilitating the development of GIS application courses in applied disciplines.

The education of GIScientists is of obvious interest to State agencies and we welcome this opportunity to express our needs. Increasingly, however, we are faced with an inability to afford these individuals and often serve as ‘intern’ programs for other organizations. Herein, perhaps, lies our most pressing need – means for employing and retaining skilled GIScientist.