

Advantages and Applications of Geographical Information System (GIS) In Fisheries

Maria Jose Felix*

Veterinary Science Department, School of Agrary and Veterinary Sciences, Portugal

Introduction

GIS may be defined as the integration of computer hard & software with spatially referred digital data so that storage, retrieval, manipulation, analysis and display all forms of geographically referenced information. A GIS is a computer-based tool used for analyzing the geographical information. It holds a database of spatial data and attributes or descriptive information about features on a map that can be used to create preferred maps [1].

Geographical Information System (GIS) has become a major component of modern life and the contribution of this system in daily life has been increasing by the new invention of technology and methods. GIS was basically developed as a tool for terrestrial use such as infrastructural development, watershed management, agriculture and forest conservation, but later it became a supporting tool in many diverse sectors. GIS and its technologies have added a new leeway in a fishery sector also by applying its tools for extracting scientific output from the collected data. Geographical Information Systems (GIS) is being applied in various forms in diverse fields [2].

Advantages of GIS

- It helps the planners in efficient & cost effective decision making based on multiple scenarios available.
- GIS allows integration of all types of data together based on geographical & locational components of data.
- GIS is application oriented.
- Frequent revision of digitized GIS data is possible.
- Changes over time can easily & rapidly monitor through GIS.
- GIS technology enables high quality output.
- Spatial patterns & processes can be effectively described & explained by GIS.

Applications of GIS in Fisheries

Identification of suitable sites for freshwater & brackish water aquaculture: This is an original use of GIS in fisheries-related work. For any successful aquaculture activity, a suitable site is a prerequisite. An optimal aquaculture site aids in better management of the aquaculture resources, and it ensures the sustainability of the farming activity. There are many criteria, guidelines, and essential factors for the selection of a site for aquaculture such as the topography of site, slope of land, water flow, volume availability, water quality, weather parameters, access and location of utilities, legislation concerning water rights, etc. helps in the decision making process. GIS gives the best platform to combine all this information and identify the areas that qualify the optimal set of parameters, which would be the best-suited areas for aquaculture [3].

Modeling fish activity and movement: These applications area is just getting underway. Here the aim is to attach numerical models to a GIS to simulate, describe, or predict a range of processes. Examples include – movement models.

Analysis of fisheries catches and effort: Fishery managers are interested in where fishing effort is concentrated; how much fish is caught where; what is the relationship between catch and effort, etc., and much exciting work is now being produced. Statistical output can be obtained from many GIS programs.

Management of marine fisheries & coastal regulation zone: The GIS-based studies will give a clear picture of the Spatio-temporal distribution of fishes in the selected study area and help in identification of critical fishing grounds in terms of fishery and marine biodiversity. The other uses of GIS are for defining fish habitat and organizing and executing living marine resources (i.e., the dynamics of marine objects), tracking marine mammals and analyzing their hunting and migrant lines; which can assess the efficiency of marine protected areas, and answer to problems related to environmental ruins [2].

Planning for water body resource zonation & mapping of aquatic species: It is important to have an inventory of wetlands and their catchments in terms of conservation and management of wetland resources. Digital maps are potent tools to achieve this. Therefore, Maps are essential for monitoring and quantifying the change over time scale, and it helps in decision making.

Distribution of different fish species in relation to physical habitat characteristics: It will be of the utmost interest for those working in fisheries management or science to know the relationships between fish distributions and various environmental parameters. The types of parameters being commonly used include water temperatures (especially thermal fronts), upwelling indices, water depth, marine chlorophyll abundance, bottom sediment type, and salinity [4].

Establishing regional and national fisheries databases: Although not directly a GIS application to fisheries management, it is clear that without substantial data inputs, then fisheries GISs could not function. So in some major fishery regions, a massive effort has gone into establishing databases, metadata sets, and in setting up regional data centers, e.g., in eastern Canada or at the various World Data Centers. Fisheries related data sets are slowly becoming accessible over the Internet [5].

Conclusion

By delivering goods and services through proper route planning,

*Corresponding author: Maria Jose Felix, Veterinary Science Department, School of Agrary and Veterinary Sciences, Portugal, E-mail: josefelix@gmail.com

Received: 03-May-2022, Manuscript No: jflp-22-63845; Editor assigned: 05-May-2022, PreQC No. jflp-22-63845 (PQ); Reviewed: 19-May-2022, QC No. jflp-22-63845; Revised: 23-May-2022, Manuscript No. jflp-22-63845 (R); Published: 30-May-2022, DOI: 10.4172/2332-2608.1000346

Citation: Felix MJ (2022) Advantages and Applications of Geographical Information System (GIS) In Fisheries. J Fisheries Livest Prod 10: 346.

Copyright: © 2022 Felix MJ. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

GIS tools can save billions of dollars annually. GIS regularly helps in the day-to-day management of many natural and human-made resources, which includes sewer, water, power, and transportation networks. An application of GIS in marine and coastal ecosystem study is an emerging field today. The marine geographical interpretation using GIS became a vital tool in the field of marine policy making, planning, and conservation. The critical role that GIS plays to the cooperation of organizations in various international agreements for the management and the use of the marine areas include maritime transport, fisheries, recreation, disposal of waste, conservation.

Acknowledgement

None

Conflict of Interest

None

References

1. Goodchild MF (2009) Geographic information systems and science: today and tomorrow. *Annals of GIS* 15(1): 3-9.
2. Meaden G (2009) Geographical Information Systems (GIS) in fisheries management and research. *Compu fish res*, Springer, Dordrecht, pp: 93-120.
3. Rubec PJ, O Hop J (1996) GIS Application for Fisheries and Coastal Resources Management. Gulf States Marine Fisheries Commission.
4. Meaden GJ, Aguilar-Manjarrez J (2013) Advances in geographic information systems and remote sensing for fisheries and aquaculture. *FAO fisheries and aquaculture technical paper*: 552.
5. Dugan JE and Davis GE (1993) Applications of marine refugia to coastal fisheries management. *Can J Fish Aquat Sci* 50: 2029–2042.