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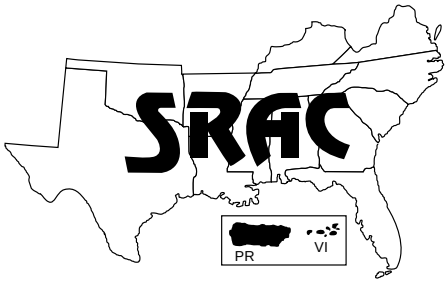

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Survey of Aquaculture Effluent Permitting and 1993 Standards in the South

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Standards for required permits directed towards controlling aquaculture effluents in the United States are set by the Environmental Protection Agency.

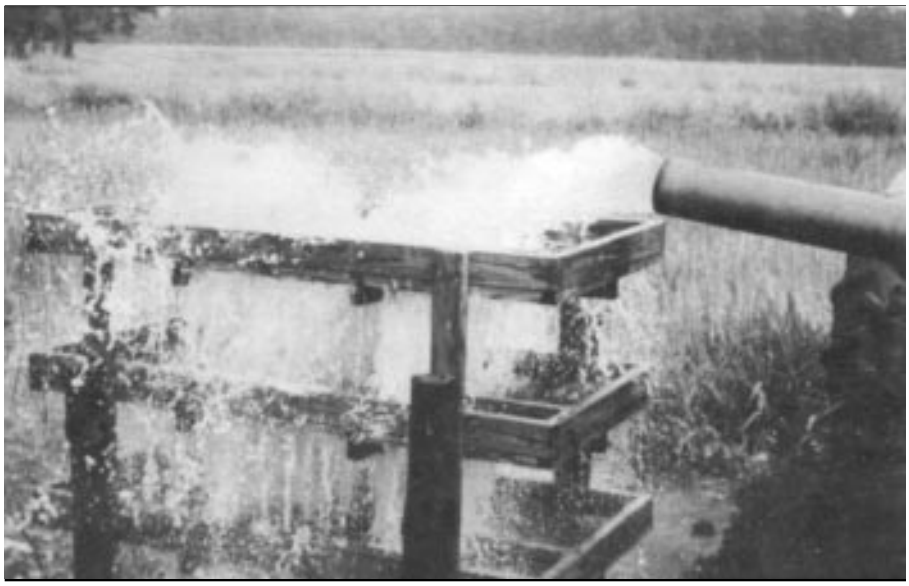
Volume 40 of the Code of Federal Regulations for 1990 states, in part, under Paragraph 122.24b:

> *(1) The Director may designate any warm or coldwater animal production facility as a concentrated aquatic animal production facility upon determining that it is a significant contributor of pollution to waters of the United States.*

It goes on to state several factors that must be considered in making this designation. This, in effect, makes any aquaculture facility subject to "special case" requirements and is the basis for regulations in several states.

Appendix C of this same paragraph states:

> *A hatchery, fish farm, or other facility is a concentrated animal production facility for purposes of paragraph 122.24 if it contains, grows or holds aquatic animals in either of the following categories:*
>
> *(a) Coldwater fish species or other coldwater aquatic animals in ponds, raceways, or other similar structures which discharge at least 30 days per year but does not include:*
>
> *(1) Facilities which produce less than 9,090 harvest weight kilograms (approximately 20,000 pounds) of aquatic animals per year; and*
>
> *(2) Facilities which feed less than 2,272 kilograms (approximately 5,000 pounds) of feed during the calendar month of maximum feeding.*
>
> *(b) Warmwater fish species or other warmwater aquatic animals in ponds, raceways, or other similar structures which discharge at least 30 days per year, but does not include:*
>
> *(1) Closed ponds which discharge only during periods of excess runoff; or*
>
> *(2) Facilities which produce less than 45,454 harvest weight kilograms (approximately 100,000 pounds) of aquatic animals per year.*



Recirculating and aerating water has lessened effluent problems for crawfish producers.

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Catfish ponds are often harvested without draining which removes effluent concerns.

Catfish ponds designed to return water to other ponds are practical in some locations.

All states in the Southern Region include some reference to these regulations in their state regulations. At the same time, there appears to be some manipulation of wording of the criteria in the materials we received from the states. Nonetheless, these criteria provide the minimum levels that require permits.

Essentially this means that most warmwater fish producing operations in the South with 25 acres or less of ponds do not require a permit. In addition, by timing their discharge to periods of high rainfall, very large operations may not be required to obtain a permit. Raceway operations and other flow-through systems with discharges more than five days a month usually would require permits.

Trout farm operations with production in excess of 20,000 pounds per year do require permits unless they use less than 5,000 pounds of feed in any one month.

State regulations

At this time **Florida, Georgia, Kentucky, Louisiana, Mississippi, Tennessee, Texas** and **Virginia** have regulations for permitting which are no more restrictive than the federal regulations.

Criteria for other states include regulations as follows:

Alabama - Must follow best management practices (BMPs) and violations will be monitored.

Arkansas - Criteria for most parameters are set by eco-regions of the state but may have additional requirements for individual streams. Chlorides, sulfates and total dissolved solids are specifically addressed.

North Carolina - Has a general permit that sets forth the federal criteria but adds that for cold water or warmwater operations that the monthly average of settleable solids may not exceed 5.0 ml/L and that there be no more than 30 mg/L of total suspended residue. In addition, the daily maximum may not exceed 10 ml/L and the total suspended residues not more than 60 mg/L. Monitoring is required on coldwater and warmwater facilities. In addition, daily average dissolved oxygen must exceed 6.0 mg/L.

Oklahoma - Generally follows the federal requirements but also lists, for pond culture, best management practices that are mandatory and some that are optional. Regulations for raceway culture and cage culture are also being developed but have not been promulgated.

South Carolina - Sets forth the federal criteria but also states, "If discharge makes up a large portion of the stream flow, a permit may still be required." This is decided on a case-by-case basis.

The majority of the states surveyed indicated that other more stringent regulations have been proposed. Florida has a general aquaculture waste permit. Texas, Louisiana and North Carolina also indicated that drafts have been submitted but hearings are incomplete.

The aquaculture industry is impacted by the lack of precise standards at the national level because states are left to determine what levels of various physical or chemical constituents are acceptable. These levels may vary from one part of a state to another depending on the receiving water. At the same time it is clear that some influent water will not meet the standards set for effluent waters. This means that the prospective aquaculturist must consider influent water quality and receiving stream water quality in site selection.

Coldwater standards

Table 1 indicates general standards that are required in Virginia for certain coldwater streams. These are similar to those found in other states. Even if influent waters meet these standards, most fish producers are unable to maintain settleable solids below 0.1 mg/L. Catfish ponds generally would be below this level as would bait minnow and sport fish ponds. At the same time these ponds might exceed even the 3 mg/L during seining/draining operations.

The dissolved oxygen levels would be a problem for warmwater fish production but most standards for these discharges are set at 3.0 mg/L and this is attainable. The total available nitrogen should be met by most fish producers but production

Table 1. Effluent standards for coldwater systems established for some receiving streams in Virginia.

Parameter	Standards	
	Minimum	Maximum
pH (units)	6.5	9.5
Oxygen (mg/L)	6.6	- - -
Total suspended solids (mg/L)	10	15
Settleable solide (mg/L)	0.1	3
Total ammonia nitrogen (kg/d)	8	30
BOD (mg/L)	- - -	10

levels might have to be adjusted downward.

The following excerpt from a state's discussion of aquaculture waste management may give some insight into the present status of regulations and possible future directions. The name of the organization has been removed but it could have been from most southern states.

> *To date,...has concentrated on point-source pollution and most agriculture has been exempt from permitting. Federal law, however, is now placing more emphasis on nonpoint pollution which includes storm runoff, silviculture, sedimentation, feedlots, normal agriculture and aquacultural discharge .... as the state environmental agency, will implement the federal provisions. Aquaculture is not as high a priority to.... as some other sources of pollution and therefore will not be routinely monitored in the foreseeable future. Farmers are expected to follow BMPs and .... will investigate reported pollution problems arising from nonadherence to these guidelines ... desires to work with fish farmers, directly or indirectly, through institutions or associations to establish BMPs for the industry.*

Summary

1 Most commercial coldwater aquaculture facilities will require Non-Point Discharge Effluent Standards permits.

2 Warmwater facilities may be managed so as not to require NPDES permits.

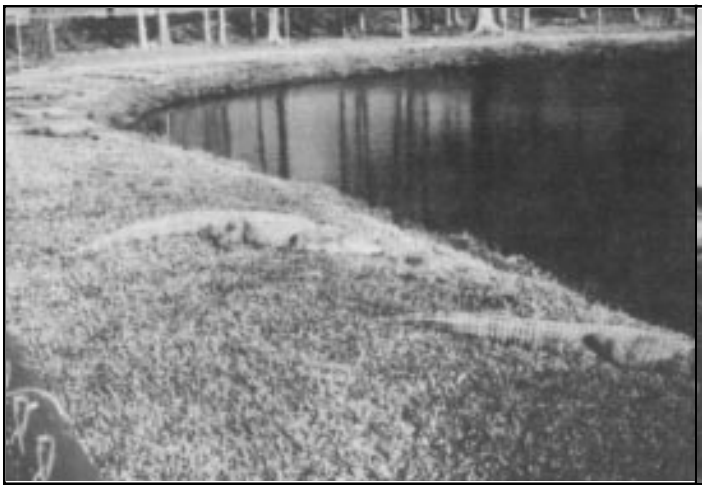
3 Specific discharge requirements (limitations) vary from state to state, but minimum standards are established by EPA. Most states only have limits on waste solids; a few may also set limits on dissolved nutrients.

4 Dissolved oxygen requirements will vary depending on water temperature with coldwater requirements 6.0 mg/L or more and warmwater requirements 3.0 mg/L or more.

5 pH requirements for effluents are usually between 6.0 and 9.0 for freshwater and 6.6 and 8.5 for saline water.

6 Generally, discharge of floating solids (including dead fish) and foam-producing materials are excluded.

7 In time, the efforts of aquaculturists to follow best management practices and environmental quality assurance will alleviate regulatory effects.



Effluent from alligator production ponds may need treatment in settling basins if discharge is necessary.

Effluent from aquaculture ponds can be used to irrigate crop land.

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