

**TABLE 9
WATER QUALITY / BENEFICIAL USE STRESSORS**

1/25/02

WATER TYPE AFFECTED	STRESSORS	TYPICAL PROBLEMS / THREATS / EFFECTS	TYPICALLY AFFECTED BENEFICIAL USES	TYPICAL SOURCES / CAUSES	TYPICAL PATHWAYS
Surface water	Physical modifications	Habitat degradation & loss; stream bed downcutting & erosion; flood plain dessication, etc; elevated temperature	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Dredging; filling; channelization; stream bed and bank lining; clearing & development; hydrology changes resulting from conversion of pervious to impervious surfaces; sand & gravel extraction; dams; coastal lagoon fragmentation; vegetation removal	(Direct & indirect)
Surface water	Invasive non-native marine species	Reduced diversity & abundance of native species; habitat degradation & loss	EST, MAR, WILD, RARE, COMM, BIOL, NAV, IND, REC-1, SHELL	Vessels; aquaria	Ballast water discharges; release of aquaria specimens and dumping of aquaria contents; transport via anchoring, fishing, and water sports equipment; self-propagation
Surface water	Invasive non-native riparian species	Reduced diversity & abundance of native species; habitat degradation & loss	EST, WILD, RARE, WARM, COLD, COMM, BIOL	Historical introductions; nurseries; landscaping; erosion control plantings	Soil disturbance; dumping; self-propagation
Surface water	Invasive non-native freshwater species	Reduced diversity & abundance of native species; habitat degradation & loss	EST, WILD, RARE, WARM, COLD, COMM, BIOL	Historical introductions; stocking; transplants, reservoir & pond overflows; aquaria	Release of aquaria specimens and dumping of aquaria contents; self-propagation
Surface water	Sediment	Sedimentation	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Erosion (of cleared land, disturbed soils, stream beds, flood plains, etc.)	Runoff; reduced tidal exchange due to lagoon fragmentation
Surface water	Suspended material	Turbidity (reduced natural light penetration); aesthetics	REC-2, EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Power plants; erosion (of cleared land, disturbed soils, stream beds, flood plains, etc.); dredge & fill activities	Cooling water intake & discharge; runoff; tidal movement
Surface water	Nutrients	Eutrophication; reduced dissolved oxygen; organic enrichment; benthic community degradation	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Fertilizer & green waste from nurseries, golf courses, agriculture, landscaping, gardening, etc.; human & animal waste	Runoff; septic systems; sewage spills & leaks; unsewered sanitary waste; treated sewage discharges; dumping; reduced tidal exchange due to lagoon fragmentation; loss of riparian canopy

**TABLE 9
WATER QUALITY / BENEFICIAL USE STRESSORS**

1/25/02

WATER TYPE AFFECTED	STRESSORS	TYPICAL PROBLEMS / THREATS / EFFECTS	TYPICALLY AFFECTED BENEFICIAL USES	TYPICAL SOURCES / CAUSES	TYPICAL PATHWAYS
Surface water	Organic material	Organic enrichment; reduced dissolved oxygen; eutrophication; benthic community degradation	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Fertilizer & green waste from nurseries, golf courses, agriculture, landscaping, gardening, etc.; human & animal waste	Runoff; septic systems; sewage spills & leaks; unsewered sanitary waste; treated sewage discharges; dumping; reduced tidal exchange due to lagoon fragmentation; loss of riparian canopy
Surface water	Human pathogens	Human health	REC-1, MUN, SHELL	Human & animal waste	Runoff; septic systems; sewage spills & leaks; unsewered sanitary waste; treated sewage discharges; vessel discharges of sewage & gray water; unsewered sanitary waste
Surface water	Trash	Aesthetics; entanglement of & ingestion by wildlife; clogging of water intakes on vessels	REC-2, EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL, NAV	Littering; dumping; spills; inadequately covered trash trucks	Runoff; wind
Surface water	Pesticides (<i>insecticides, herbicides, rodenticides, fungicides, etc.</i>)	Toxicity; human health	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL, SHELL	Nurseries; golf courses; agriculture; landscaping; gardening; ant, termite & flea control	Runoff; aerial deposition
Surface water	Metals (<i>copper, lead, zinc, etc.</i>)	Toxicity; human health	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL, SHELL	Vessel hull paint; vehicles; algae control	Runoff; leaching; vessel maintenance and repair; underwater hull cleaning and paint removal; aerial deposition
Surface water	PCBs (<i>polychlorinated biphenyls</i>)	Toxicity; human health	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL; SHELL	Industrial activities	Runoff; spills & leaks
Surface water	PAHs (<i>polynuclear aromatic hydrocarbons</i>)	Toxicity; human health	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL, SHELL	Combustion; creosote-treated pilings	Runoff; leaching; aerial deposition

**TABLE 9
WATER QUALITY / BENEFICIAL USE STRESSORS**

1/25/02

WATER TYPE AFFECTED	STRESSORS	TYPICAL PROBLEMS / THREATS / EFFECTS	TYPICALLY AFFECTED BENEFICIAL USES	TYPICAL SOURCES / CAUSES	TYPICAL PATHWAYS
Surface water	Petroleum (<i>gasoline, diesel, fuel oil</i>)	Toxicity; aesthetics	REC-2, EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Vehicles; vessels; storage tanks; transfer operations; waste oil disposal	Runoff; spills & leaks; incompletely burned fuel in exhaust; groundwater extraction discharges
Surface water	MTBE (<i>methyl tertiary butyl ether</i>)	Taste; odor; human health; toxicity	MUN, EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Storage tanks; vessels	Spills & leaks; incompletely burned fuel in exhaust; runoff
Surface water	Chlorine	Toxicity	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Power plants; potable water; swimming pools; treated sanitary wastewater	Cooling water discharges; water tank & pipeline dewatering; pool draining
Surface water	Other toxic substances	Toxicity, human health	MUN, EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Military, industrial & urban activities	Runoff; spills & leaks; groundwater extraction discharges
Surface water	Heat	Elevated temperature; reduced dissolved oxygen	EST, MAR, WILD, RARE, WARM, COLD, COMM, BIOL	Power plants; loss of riparian canopy	Cooling water discharges; development / construction
Surface water	Increased salinity	Human health; aesthetics; plant growth	MUN, AGR	Irrigation; imported water; water reuse; human & animal waste; brine	Runoff
Surface water	Reduced salinity	Reduced diversity & abundance of native species; habitat degradation & loss	EST, MAR, WILD, RARE, BIOL, COMM, SHELL	Hydrology changes resulting from conversion of pervious to impervious surfaces and use of imported water; discharges of runoff, unsewered waste, spills & leaks, and wastewater upstream of naturally brackish, estuarine, or saltwater wetlands	Runoff; spills & leaks; wastewater discharges
Ground water	Salts	Human health; aesthetics; plant growth	MUN, AGR	Irrigation; imported water; water reuse; human & animal waste; groundwater overdraft	Evapotranspiration; percolation; saltwater intrusion
Ground water	Nitrates	Human health	MUN	Nurseries, golf courses, agriculture, landscaping, gardening, etc. (fertilizer & green waste); human & animal waste	Irrigation; septic systems
Ground water	Petroleum (<i>gasoline, diesel, fuel oil</i>)	Taste, odor, human health	MUN	Storage tanks	Spills & leaks
Ground water	MTBE (<i>methyl tertiary butyl ether</i>)	Taste, odor, human health	MUN	Storage tanks	Spills & leaks

TABLE 9
WATER QUALITY / BENEFICIAL USE STRESSORS

1/25/02

WATER TYPE AFFECTED	STRESSORS	TYPICAL PROBLEMS / THREATS / EFFECTS	TYPICALLY AFFECTED BENEFICIAL USES	TYPICAL SOURCES / CAUSES	TYPICAL PATHWAYS
Ground water	Solvents (<i>TCE, PCE, DCE</i>)	Taste, odor, human health	MUN	Dry cleaners; service stations; plating shops; other military, industrial & urban activities	Spills & leaks
Ground water	Other toxic substances	Human health	MUN	Military, industrial & urban activities	Spills & leaks