Connecticut Fund for the Environment

Save the Sound®
A program of Connecticut Fund for the Environment

FINAL Comments of Connecticut Fund for the Environment / Save the Sound on the Department of Environmental Protection's Proposed Amendments to Connecticut's Water Quality Standards

March 17, 2010

Connecticut Fund for the Environment (CFE") is a statewide environmental organization using law, science and public education to defend and improve the air land and water in and around Connecticut and the Long Island Sound. Save the Sound is a permanent program of CFE. CFE/Save the Sound represents over 6,000 members from 4,800 households and submits these comments on their behalf.

Connecticut Fund for the Environment and its permanent program Save the Sound hereby submit the following comments to the DEP's Proposed Amendments to Connecticut's Water Quality Standards issued on December 22, 2009. CFE hereby resubmits comments submitted in an earlier proceeding on these measures (attached). CFE further adopts, as their own, comments submitted on this record by Richard Weissberg dated February 3, 2010. Finally, CFE supports DEP's update of criteria for toxic substances to reflect the latest science in this area.

On April 16 DEP issued a Notice of Intent To Conduct a Triennial Review of Water Quality Standards and solicited comments. Pursuant to such notice, CFE filed comments primarily addressing the Proposed Nutrient Reduction Strategy for Inland Fresh Waters: Phosphorus ("Phosphorous Strategy"). Other comments were submitted by Richard Weisssberg and others addressing, *inter alia*, anti-degradation requirements and temperature criteria.

After the comment period, DEP made some changes to address anti-degradation requirements and temperature criteria. DEP did not make any significant changes to the Phosphorous Strategy. A public hearing was held on February 3, 2010. The undersigned testified orally at such public hearing on behalf of CFE and these comments are submitted in support of such testimony.

CFE continues its objections to the Phosphorous Strategy because such standards are inconsistent with EPA guidance and are not based upon a reasonable science or ecology based alternative to such guidance. As stated in the attached comments:

The Phosphorous Strategy fails to comply with state and federal law and fails to adequately protect water quality in Connecticut. The criteria are not scientifically based nor are they designed to protect designated uses, which are the core purposes of Water Quality Standards. Instead, the Phosphorous Strategy seeks to statistically identify the most enriched water bodies and then impose feasibility and cost based best management practices ("BMPs") premised on best professional judgment.

Similarly, if viewed as a case by case determination of appropriate effluent limitations for specific plants, rather than appropriate Water Quality Standards, the Phosphorus Strategy falls short. While the strategy incorporates some positive antidegradation measures to ensure that streams that are not already impaired do not become impaired, it fails to identify impaired streams and set water quality based limits that will no longer cause or contribute to such impairments as required by law.

CFE supports DEP's updating of numeric toxic criteria. Water Quality Standards must be updated every three years precisely because to be protective, such standards have to be based on the latest and strongest updated science. We applaud DEP's inclusion of updated and scientifically based toxics standards.

Accordingly, CFE formally resubmits the attached comments to DEP's Phosphorous Strategy and adopts the comments of Richard Weissberg submitted on this record on February 3, 2010.

Respectfully submitted,

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Comments of Connecticut Fund for the Environment / Save the Sound on the Department of Environmental Protection's Notice of Intent to Conduct a Triennial Review of Water Quality Standards issued by DEP on April 16, 2009 and Proposed Nutrient Reduction Strategy for Inland Fresh Waters: Phosphorus.
July 16, 2009

Connecticut Fund for the Environment (CFE") is a statewide environmental organization using law, science and public education to defend and improve the air land and water in and around Connecticut and the Long Island Sound. Save the Sound has existed since 1972 and has been a permanent program of CFE since 2005. CFE/Save the Sound represents over 6,000 members from 4,800 households and submits these comments on their behalf.

SUMMARY OF COMMENTS

Phosphorous is a harmful water pollutant that, until now, has been largely uncontrolled in Connecticut. It causes harmful algal blooms destroying the ecology, aesthetics and recreational value of lakes, rivers and streams. CFE believes that the Phosphorus Strategy appropriately identifies a goal of setting phosphorus policy on a statewide basis, rather than on an isolated plant-by-plant basis. We also believe that prioritizing water bodies as high, medium and low-enrichment is a productive strategy; applying anti-degradation to low enrichment situations and water quality based effluent limitations ("WQBELs") to high and medium enrichment situations. We believe, however, that the approach to identifying water quality standards and associated WQBELs set out in the strategy has significant flaws in its failure to incorporate scientific and legal principles as required by the Clean Water Act ("CWA") and should be modified accordingly.

Most fundamentally, the Phosphorous Strategy fails to comply with state and federal law and fails to adequately protect water quality in Connecticut. The criteria are not scientifically based nor are they designed to protect designated uses, which are the core purposes of Water Quality Standards. Instead, the Phosphorous Strategy seeks to statistically identify the most enriched water bodies and then impose feasibility and cost based best management practices ("BMPs") premised on best professional judgment.

Similarly, if viewed as a case by case determination of appropriate effluent limitations for specific plants, rather than appropriate Water Quality Standards, the Phosphorus Strategy falls short. While the strategy incorporates some positive anti-degradation measures to ensure that streams that are not already impaired do not become impaired, it fails to identify impaired streams and set water quality based limits that will no longer cause or contribute to such impairments as required by law.

The Phosphorus Strategy also assumes that sewage treatment plants can receive less stringent limits because BMPs will be employed by private entities that will reduce the amount of phosphorous discharged by urban and agricultural land uses (or non-point sources) by 60%. There is no reasonably certain and enforceable mechanism, however, that could be expected to lead to such reductions. Therefore, any assumption that BMPs will be implemented is without legal, scientific or policy basis.

In the broader sense, it is imperative that DEP begin to make such BMPs from urban and agricultural land uses firm and enforceable in a way that will be reflected in actual improved water quality. Until DEP does so, the brunt of limiting nutrients into streams will necessarily fall solely on sewage treatment plants, a result that is not realistic, equitable or desirable.

PHOSPHOROUS AND WATER QUALITY

Phosphorous destroys water quality by creating algae filled lakes that are oxygen depleted, and recreationally and aesthetically impaired. While nutrients are an essential part of healthy rivers and lakes, an excess of nutrients causes eutrophication and has a severely negative impact on water quality. Phosphorous loading into a stream or a lake will increase the growth of plants to unhealthy and harmful levels causing, among other things, unpleasant and unhealthy green algal blooms in lakes, impoundments, streams and rivers. Attached are images of what appear to be a number of algal blooms along the Housatonic and Quinebaug-Shetucket Rivers that could be visually identified using simple tools such as Google Earth. The excess plant life removes oxygen from the waters creating low oxygen or hypoxic conditions. Such blooms also cause large swings in the acidity of the water and the amount of oxygen available making the water inhospitable to fish. Particularly severe algal blooms in lakes and impoundments may even become toxic to animals and humans. Mats of algae can smother stream bottoms and reduce habitat quality for macroinvertebrates, an important part of the food chain.

THE PHOSPHORUS STRATEGY FAILS TO SET SCIENTIFICALLY SUPPORTED WATER QUALITY STANDARDS AS REQUIRED BY THE CWA

Water Quality Standards Must Protect Designated Uses. The fundamental flaw with DEP's approach is that it does not adequately address the critical factor that is at the heart of the Water Quality Standards -- whether and to what extent water quality is sufficient to protect designated uses. Regulations under the Clean Water Act provide that Water Quality Standards "must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use." 40 CFR §131.11(a).

Moreover, such criteria must be based either upon guidance set forth by EPA pursuant to Section 304(a) of the Clean Water Act, or upon other scientifically based methods. 40 CFR §131.11(b). If numeric criteria cannot be established, the agency may utilize narrative criteria, so long as such criteria are based upon biomonitoring methods. Id.

The approaches suggested by EPA and the State of Maine are set out below. While neither should necessarily be followed strictly, both are examples of scientifically and legally sound standards designed to protect water quality.

EPA Guidance. There are a number of basic approaches set forth in EPA Guidance. EPA, Nutrient Criteria Technical Guidance Manual, Rivers and Streams, p. 94-95 (2000) (hereinafter EPA Guidance)[1] (see also US EPA Ambient Water Quality Criteria Recommendations, (2000)).[2] The approach most similar to the one chosen by DEP is to calculate the 5th to 25th percentile of enriched streams and use the selected percentile to develop criteria. EPA Guidance, p. 94-95. Under this approach, streams are ranked in order of enrichment, low to high. They are segregated into three separate categories, reference, at risk and impaired. Id. Because CT is a highly developed state with high levels of enrichment, the 5th percentile is probably the more appropriate part of the range to use.

Because these reference ranges are only statistical, the next and critical step is to check them against actual indicators of water quality. Id., p. 104. Again, a number of approaches are possible. Perhaps the most straightforward is comparison to biological criteria such as eco-regional and water body specific nutrient levels. Other bio-criteria include chlorophyll a, Secchi depth/turbidity or use of published nutrient thresholds or literature recommendations. Id. The criteria should then be revised based upon ongoing sampling results or based upon any other relevant criteria. Id. p. 105.

Maine Proposed Effects-Based Criteria. In creating its own proposed nutrient criteria, the State of Maine combined a number of biological nutrient criteria for determining impairment. These included (1) Secchi depth, (2) chlorophyll a, (3) total phosphorus, (4) algae cover, (5) fungi and bacteria, (6) dissolved oxygen and (7) aquatic life use attainment. Draft Maine Nutrient Criteria for Fresh Surface Waters, p. 2-3.[3] The Maine Standards then combined the biological indicators with total phosphorous level indications to create a matrix of impaired and non-impaired water bodies. Id. p.6.

DEP's General Approach Fails to Incorporate Biological Indicators. While the DEP's Phosphorous Strategy relies upon both numeric (effluent limits) and narrative (unnatural levels of enrichment) criteria, neither is properly designed, nor sufficient, to protect water quality. Like the approach set forth in the EPA guidance, DEP uses a statistical model to categorize lakes. The Phosphorus Strategy, however, never takes the next essential step to check those statistics against biological criteria in the lakes and

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[1] http://www.epa.gov/waterscience/criteria/nutrient/guidance/rivers/rivers-streams-full.pdf
[2] http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/rivers/rivers_14.pdf
[3] http://www.maine.gov/dep/blwq/rules/Other/nutrients_freshwater/Chapter_583_090414_rhd.pdf
(accessed July 15, 2009)

rivers. Without this information, it is impossible to determine what the statistics mean with respect to water quality. More specific comments and suggestions are included below.

Agricultural and Urban Runoff Pollution are Not "Natural Conditions." To determine the final effluent limit for each facility, the Phosphorus Strategy has concentrated on how highly the waterbody is enriched as compared to what would be expected under a modeled fully forested condition with allowances for a significant amount of non-point pollution from agricultural and urban land uses. While the Phosphorus Strategy calls this a "natural condition," it is not, in fact, a natural condition in the way that term is regularly or properly used because it allows for a certain level of loading from urban and agricultural uses. To speak of a chemical factory or an apartment complex as "land in its natural state" does not make any sense. Moreover, the Strategy assumes that certain BMPs will be put in place to limit those uses, when there is not yet a mandatory enforceable scheme to achieve such reductions. Allowance of agricultural and non-point pollution as natural conditions is inconsistent with the plain meaning or proper meaning of that term and is also inconsistent with the Clean Water Act. *Thus, DEP should move away from the "natural condition" narrative criteria or at very least change the definition of "natural condition" so as not to include urban and agricultural runoff pollution.*

DEP Has Presented No Scientific Basis to Characterize the 33.3rd Percentile of Non-Tidal Streams Receiving Sewage Discharges as Low Enrichment – The Phosphorus Strategy categorizes streams into three groups based upon phosphorus levels as compared to a "natural condition." (As set forth above, the Phosphorus Plan defines a natural condition to include certain amounts of urban and agricultural runoff pollution). Based upon this, the three categories are -- low-enrichment (bottom third), medium-enrichment (middle third) and high enrichment (top third). This means that streams within the 33.3rd percentile are considered low-enrichment. DEP has provided no water quality or science based justification for setting the cutoff at the 33.3rd percentile. Under the EPA Guidance, it is suggested that this "low" category (referred to as reference streams by EPA) be limited to streams in the 5th to 25th percentile. The lower range (5th percentile) is recommended for situations like the instant one because the data is only from streams that have sewage treatment plants on them and are more likely to be impaired. EPA Guidance, p. 95. While DEP is not bound by EPA guidance, and may diverge from the guidance if it has a scientific biological basis to do so, DEP has failed to present such a justification. *Thus, DEP should revise the Phosphorus Strategy to be consistent with EPA Guidance or should develop a new number based upon sound science and water quality.*

The Phosphorus Strategy Has Not Followed EPA Guidance and Has Presented No Independent Scientific Basis to Characterize the 55.5 Percentile of Streams as Low Priority – Although statistical analysis in the Phosphorus Strategy began by dividing rivers into three equal categories, a number of factors were applied to substantially reduce the number of highly enriched streams and increase the number of low level enriched streams. In addition to characterizing rivers according to total levels

of phosphorous loading, the Phosphorus Strategy characterized such rivers according to what percentage of that phosphorous was due to sewage treatment plant discharges. While the Phosphorus Strategy decreased the impairment status of a waterbody if a sewage treatment plant contributed less than other sources, it did not correspondingly increase the impairment status if a sewage treatment plant contributed more. This resulted in a final matrix where 55.5% (or 5/9) of streams were characterized as low priority. 33.3% were characterized as medium priority and only 11.1% (1/9) were characterized as high priority. Thus, while EPA recommends that the 5th percentile of streams be initially placed in a low priority category, the Phosphorus Strategy initially placed the 55.5th percentile of streams in that category. After other various adjustments based on best professional judgment were performed, the distribution was low – 48%, medium – 60%, and high 21%. The Phosphorus Strategy failed to provide any scientific basis for so radically diverging from the EPA Guidance. *Accordingly, the final categorization of sewage treatment plants and streams should be amended to comply with EPA Guidance or should be revised based upon sound science and actual water quality.*

DEP Failed to Check its Statistical Analysis Against Actual Water Quality. While a statistical analysis can be a good starting point, the categories must ultimately be compared against actual indicators of water quality to ensure that they are protective. EPA Guidance at p. 103. Without such a comparison, any numbers derived by statistics are scientifically meaningless. *Id.* It does not appear from the technical document that this comparison and/or adjustment ever occurred. Thus, while the Phosphorus Strategy has created a rather elaborate statistical analysis based on a number of technical considerations, the primary and most essential consideration – water quality – has not been factored in, in a meaningful or scientifically defensible manner. For examples of scientific effects-based water quality criteria, DEP need look no further than EPA Guidance or examples from other states such as Maine. See *infra,* p. 3. *Thus, DEP should develop science based biological criteria for water quality to meaningfully interpret its statistically based categories.*

THE PERMIT LIMITS ASSOCIATED WITH INDIVIDUAL PLANTS HAVE NOT BEEN SHOWN TO BE PROTECTIVE OF WATER QUALITY OR IN COMPLIANCE WITH THE CWA

The remainder of these comments shall address the appropriateness of the individual permit limits applied in the Phosphorus Strategy to each sewage treatment plant as if incorporated into NPDES permits on a case by case basis.

DEP Should Not Include Final Technology and Cost Based Effluent Limits for Specific Plants in their Water Quality Standards – Water Quality Standards are designed to set criteria to ensure that water quality in any given water body protects the designated use for that waterbody. 40 CFR §131.11(a). The Phosphorus Strategy, however, does not set such standards, but instead arrives at cost and feasibility based effluent limitations for each plant. While there are many benefits to creating a statewide strategy, and we applaud the Phosphorus Strategy as an effort to begin to do so, it is

inappropriate as a matter of law, or good policy, to include that entire strategy in the Water Quality Standards, either as an appendix or otherwise. The role of Water Quality Standards is to determine what the water quality in the receiving bodies should be. Id. The role of final effluent limits is to protect that water quality. 33 USC §1312(a). *Thus, the Phosphorus Strategy should be removed from the Water Quality Standards and replaced with science based standards to protect water quality.*

The Limits in the Phosphorus Strategy Should be Expressed as Effluent Limitations Rather than BMPs. While DEP talks in terms of BMPs, the limits it set on sewage treatment plants are actually proposed effluent limits applied to specific point sources. It is unclear whether DEP views this as a substantive difference, or one of terminology, but we believe the Clean Water Act is clear that actual effluent limits are required for point sources. The Clean Water Act requires effluent limitations to be developed for pollutants that are sufficient to achieve Water Quality Standards even if such limits are more stringent than required to meet technology based limitations. 33 USC §1311(b)(1)(C). Effluent limits are restrictions on quantities discharge rates and concentrations imposed on point sources. 40 CFR 122.2. BMPs, on the other hand, are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." Id. *Thus, the limitations imposed by DEP have all the characteristics and requirements of effluent limits and should be treated as such.*

The Effluent Limitations in the Phosphorus Strategy Are Improperly Based on Economic and Technical Feasibility and Have Not Been Demonstrated to be Protective of Water Quality

The Phosphorus Strategy fails to provide any scientific analysis that would demonstrate that the effluent limits applied to the individual sewage treatment plants are sufficient to protect the water quality of the receiving streams. Instead, the limits were based solely on "technical, economic, and institutional feasibility." DEP Technical Support Document p. 9. The Phosphorus Strategy did not consult the actual quality or designated uses of the affected waterbodies, nor any scientific support as required by the CWA. 40 CFR 131.11. See *In Re City of Marlborough, MA, Easterly Wastewater Treatment Facility*, 12 EAD 235, 250-251 (EAB 2005). "Without defining what the existing quality of the water is, it is not possible to evaluate whether [the] proposed discharge has been restricted to the extent necessary to preserve that quality." *Minnesota Center for Environmental Advocacy v. Commissioner of Minnesota Pollution Control Agency*, 696 N.W.2d 95, 108 (Minn. App. 2005).

For discharge of pollutants from point sources, the Clean Water Act requires effluent limitations to be established that "can reasonably be expected to contribute to the attainment or maintenance" of the water quality in a specific portion of the navigable waters. 33 USC 1312(a). "The Commissioner shall not issue or renew a permit unless such issuance or renewal is consistent with the provisions of the Clean Water Act." CGSA §22a-430(a) (see also, CT ADC §22a-430-3(d)(4)(A)). The EPA has classified phosphorus discharges as pollutants that contribute to or cause impairments in

waterbodies through nutrient enrichment. United States Environmental Protection Agency, National Recommended Water Quality Criteria, 2009.[4] An impaired waterbody is one that does not meet the set water quality standards. EPA Office of Wastewater Management, *Improving Water Quality in Impaired Waterbodies Pending the Establishment of a TMDL*, 1999.[5]

In fulfilling its duties under state and federal law, the DEP must set limitations such that no pollutant shall "cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard." 40 CFR §122.44(d)(1)(i). See also EPA, NPDES Permit Writers' Manual, at 87 (1996).[6](Permit writer must consider the impact of discharges on receiving waters.) Water quality-based limits or WQBELS are required "even if those limits are more stringent than those required under technology-based effluent limits." *In Re Westborough and Westborough Treatment Plant Board*, 10 EAD 297, 312 (EAB 2002) (citing 33 USC §§1311(b)(1)(C)).

The DEP is not permitted to take into account economic and available technology considerations under the CWA when setting WQBELS for sewage treatment plants. *Id.*

The Phosphorus Strategy set three separate levels of phosphorus limits: 1) Low priority plants are capped at current load, 2) medium priority are limited at 0.7 mg/L and 3) high priority are limited at 0.2 mg/L. Technical Support Document p. 9. As discussed above, these limits were set based solely upon technical and economic feasibility, with no consideration of water quality. Id. Thus, the Phosphorus Strategy's sole reliance on feasibility criteria in setting the limits plainly violates the CWA and fails to "*ensure* compliance with the applicable water quality requirements." 40 CFR 122.4(d) (emphasis added). Although DEP has slightly modified some of these limits based upon their best professional judgment, there is nothing approaching a scientific analysis to ensure that the new limits will not cause or contribute to water quality impairments. The "mere possibility of compliance with Water Quality Standards does not 'ensure' compliance." *Marlborough* at 250.

Thus, DEP should develop a reasonable basis, grounded in science and water quality, to ensure that the proposed effluent limits do not cause or contribute to water quality impairment.

The Phosphorus Strategy Fails to Provide a Science or Water Quality Based Justification for Limiting the Policy to April Through October. The phosphorus limits discussed in the Phosphorus Strategy would be seasonal limits applying only from April to October. There would be no limits during the winter. While algae generally does not bloom in winter, phosphorus discharged during winter months can be stored in sediments, particularly in impoundments and lakes. Those sediments release the excess nutrients throughout the year, contributing to algae blooms. In *Marlborough*, the

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[4] http://www.epa.gov/waterscience/criteria/wqctable/#nonpriority

[5] http://www.epa.gov/npdes/pubs/ftshbf.htm.

[6] Available at http://cfpub1.epa.gov/npdes/writermanual.cfm?program_id=0

Environmental Appeals Board remanded a permit issued by EPA in Massachusetts because there was no reasonable justification for why the interim phosphorus limit did not apply in certain seasons. *Id* at 244-245. *Thus, the Phosphorus Strategy should either provide a scientific basis to show that phosphorus discharged in unlimited quantities throughout the winter is not entering into sediments and is not contributing to water quality impairments or impose the limits year-round.*

For the reasons set forth above, CFE/Save the Sound strongly encourages the DEP to revise the Phosphorus Strategy to develop science based water quality standards for phosphorus, and to develop individual permit limits that will adequately protect streams and rivers from algal blooms caused by over-enrichment. We look forward to continuing this dialogue.

Respectfully submitted,

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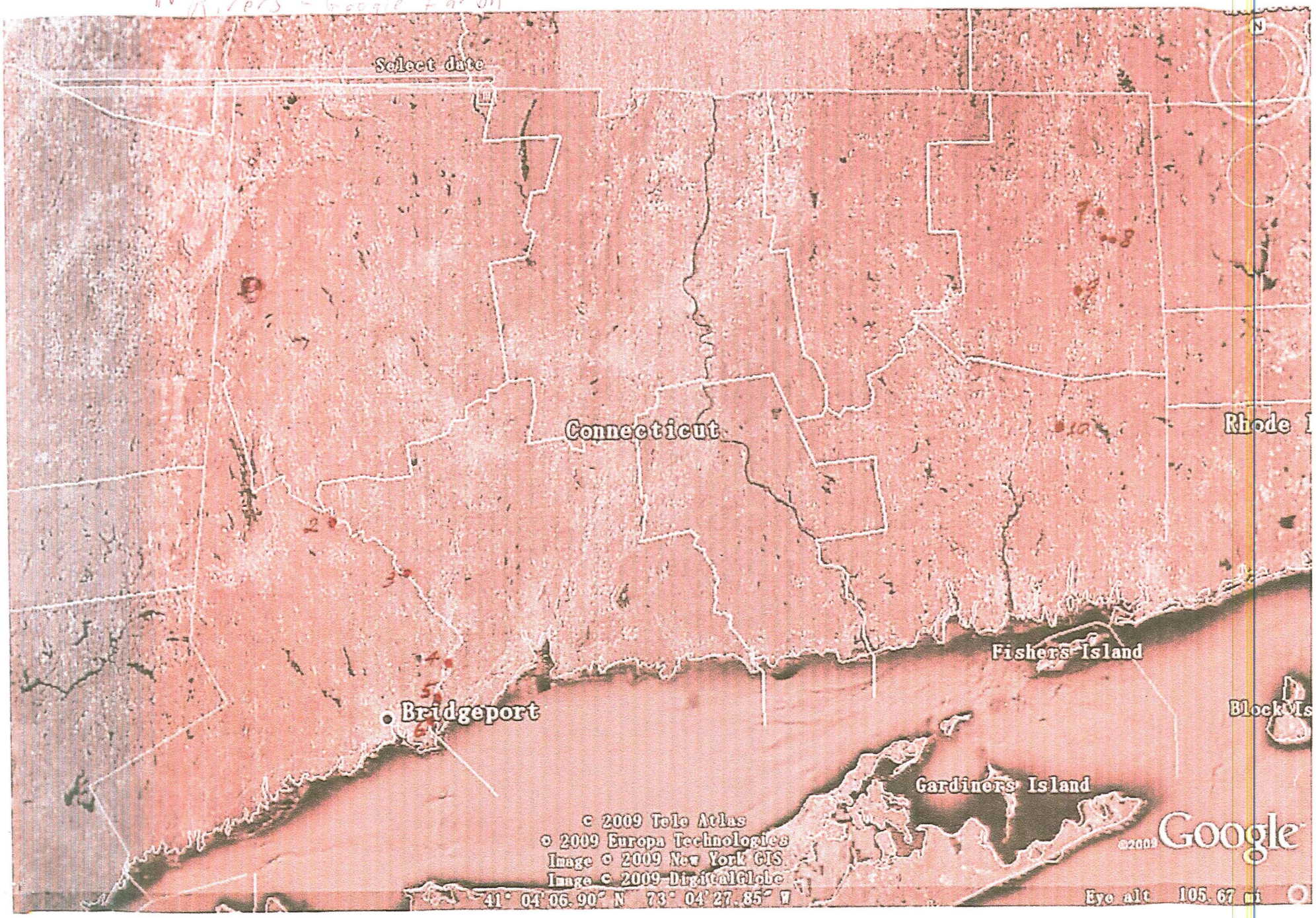
Attachment

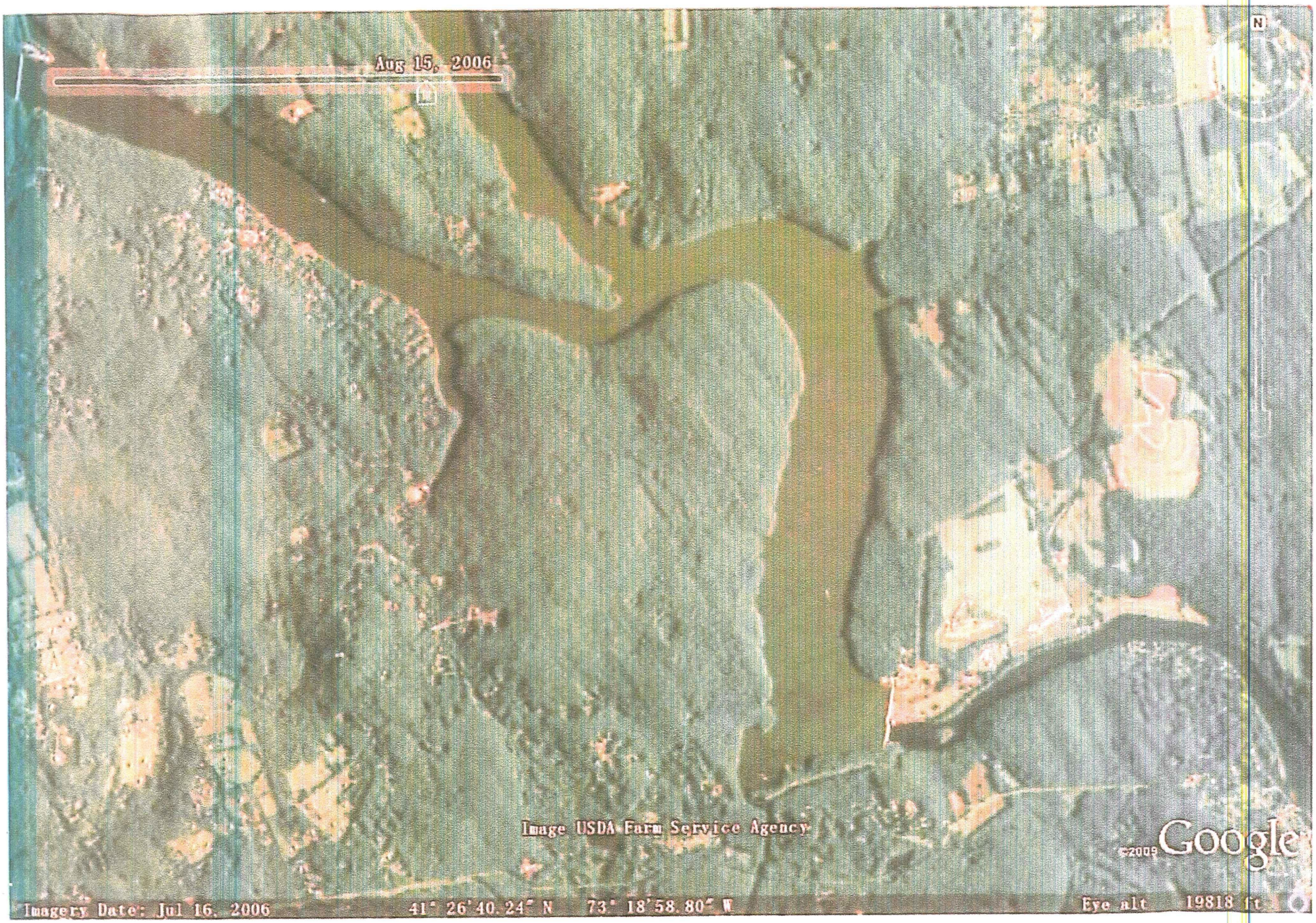
Images from Google Earth Documenting Visually Identifiable Instances of Apparent Algae Blooms Along Housatonic and Quinebaug-Shetucket Rivers

Compiled by Jian Li, Intern at CT Fund for the Environment/Save the Sound

Apparent Instances of Algae Problems on Housatonic and Quinnebaug-Shetucket Rivers - Google Earth



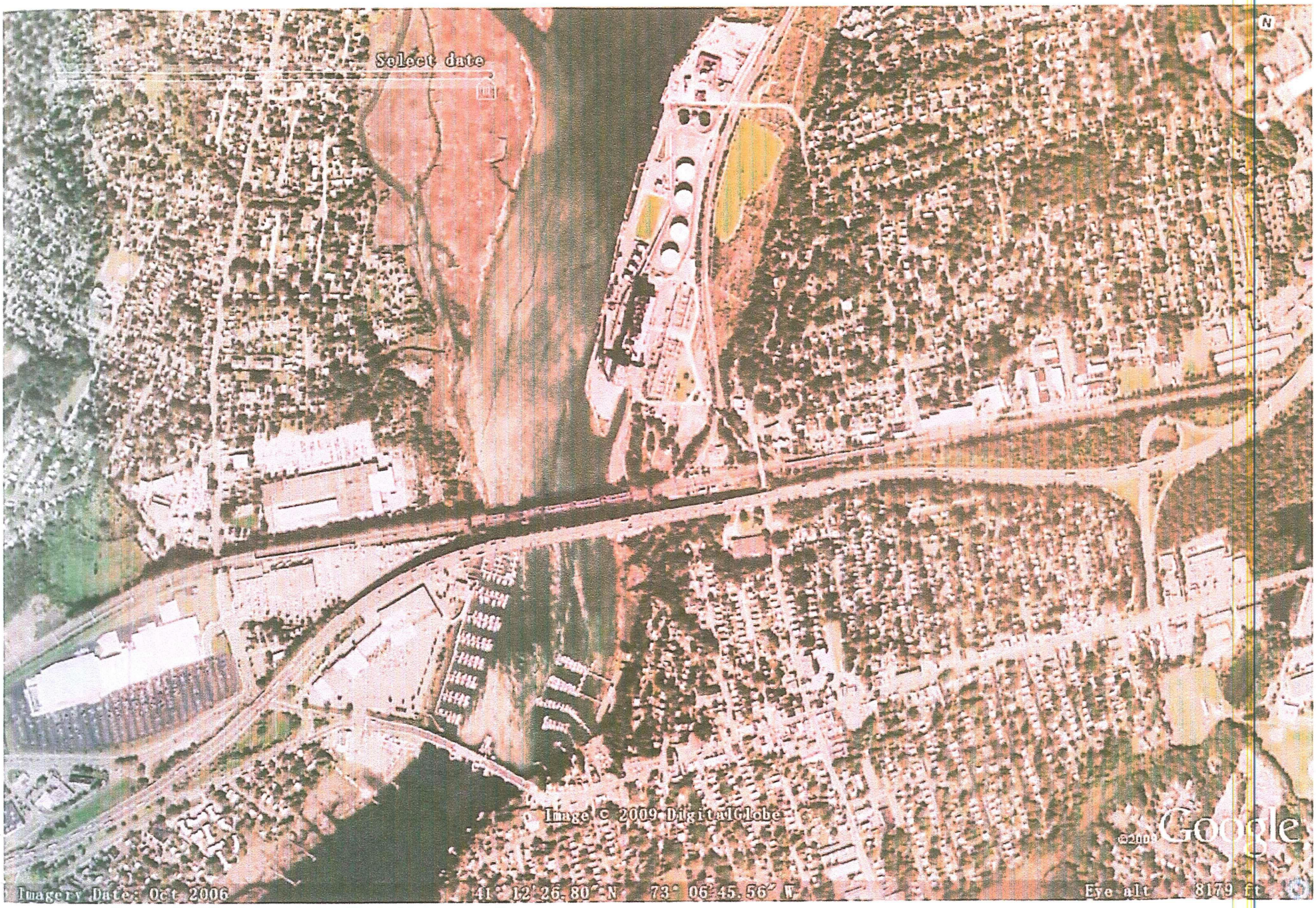
#2 Housatonic River, near Newton, Aug 2006



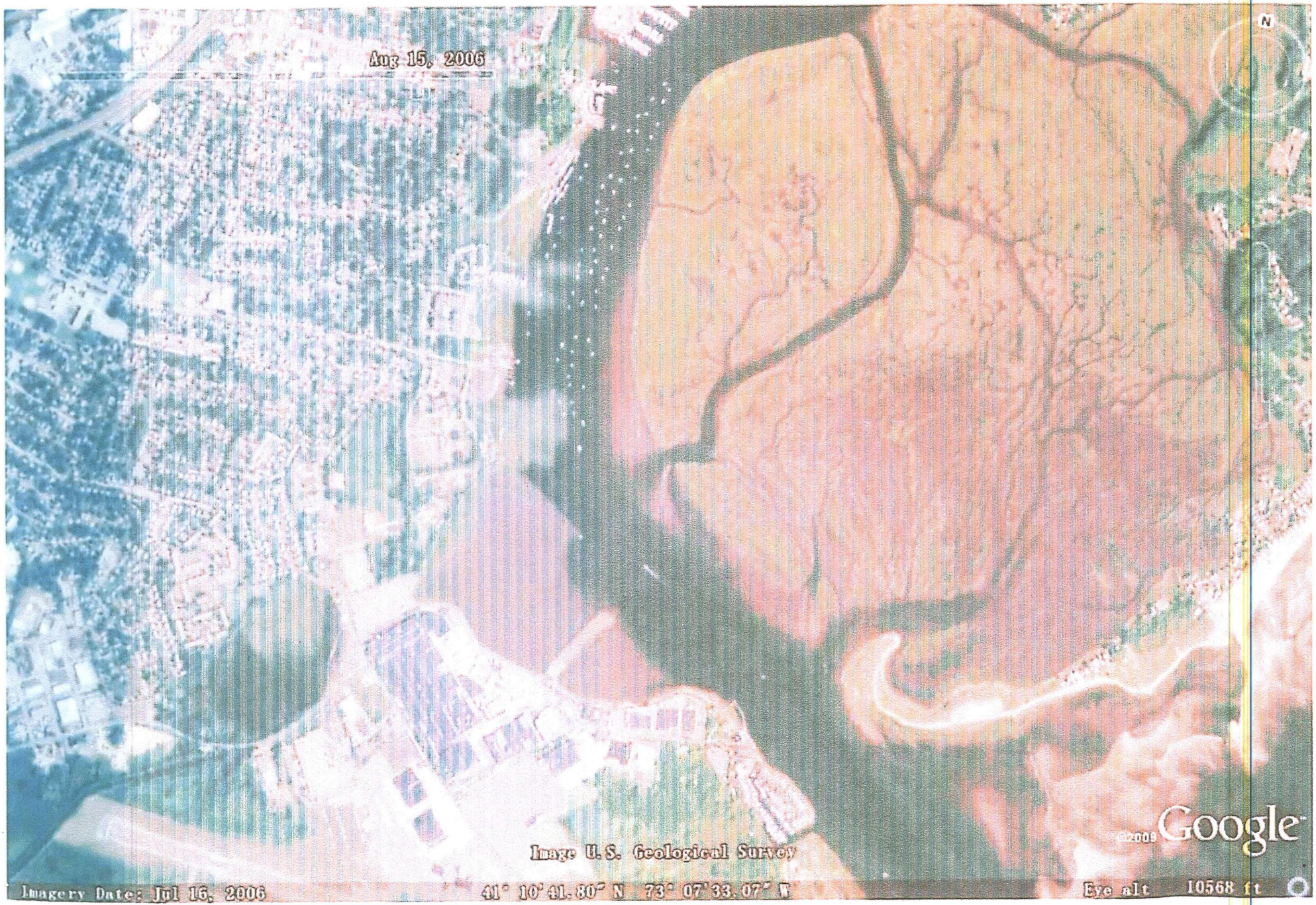
#3 Housatonic River, near Stevenson, July 2009

#4 Housatonic River, near Stratford, Aug. 2006

#5 Housatonic River, Stratford, July 2009



H6.1 Housatonic River, Stratford, Aug. 2006



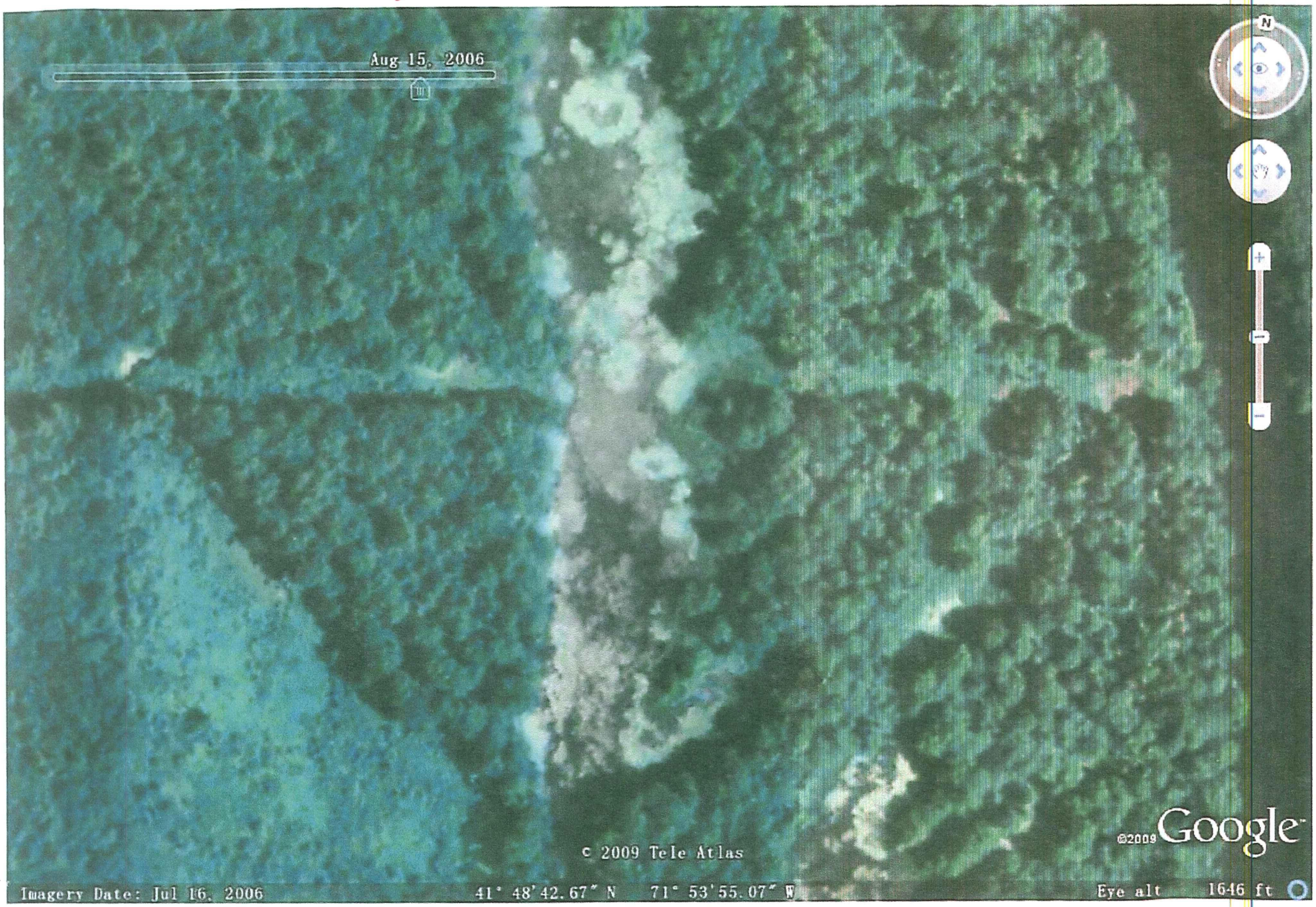
#6.2 Apr. 1991


Apr 14, 1991
Image U.S. Geological Survey
©2009 Google
Imagery Date: Apr 13, 1991
41°10'41.96" N 73°08'18.70" W
Eye alt 10568 ft

#7. Quinebaug River, near Rogers, Aug. 2006

#8.1 Quinebaug River, near Danielson, Aug. 2006

#8.2 Aug. 2006


Aug 15, 2006
N
©2009 Google
© 2009 Tele Atlas
Imagery Date: Jul 16, 2006
41° 48' 42.67" N 71° 53' 55.07" W
Eye alt 1646 ft

#9.1 Quinebaug River, near Central Village, July 2009

#9.2 Aug, 2006


Aug 15, 2006
N
© 2009 Tele Atlas
Google
Imagery Date: Jul 16, 2006
41° 44' 19.79" N 71° 56' 34.98" W
Eye alt 2516 ft

#10. Thames River, near Norwich, Aug. 2006