Environment and Natural Resources Trust Fund
Emerging Issues Account
Adopted 1/15/08 by LCCMR

116P.08 TRUST FUND EXPENDITURES.
Subd. 4. **Legislative recommendations.**
d) The commission may recommend the establishment of an annual emerging issues account in its annual legislative bill for funding emerging issues, which come up unexpectedly, but which still adhere to the commission's strategic plan, to be approved by the governor after initiation and recommendation by the commission.

Emerging Issues Account Criteria
The funds in the Emerging Issues Account may be recommended for an effort that has an unexpected and urgent need, such as:

- Addressing environmental or disease issues where delay will threaten the viability of segments of the State's natural resources or human health;
- Implementing a natural resource corrective action where delay will be detrimental to the State's natural resources;
- An opportunity to enhance natural resource management in a timely manner;
- An opportunity to acquire critical land in a timely manner.

Use of the funds must be consistent with the Commission's strategic plan. Notification of the availability of the Emerging Issues Account will be posted on the LCCMR web site.

Requesting funds
To be considered for a LCCMR recommendation for use of the Emerging Issues Account, a letter (one page limit) must be submitted to the LCCMR requesting funds. The letter must:

- Describe the specific urgency;
- Explain how the request fits the emerging issues account criteria;
- Explain the proposed use of the funds including proposed results and deliverables.

Attached to the letter requesting consideration of funding must be a description of the organization describing its capability to carry out the activity proposed.

Awarding funds
- The Commission will review requests at least semi-annually at posted and open meetings.
- For a request to be approved, a quorum of the Commission must be present and at least 60% of those members present must vote in favor of approval.
- If a request is approved by the LCCMR it will be sent to the governor for consideration per M.S. 116P.08, Subd. 4.
- If the commission recommends that funds be put in the emerging issues account and those funds are made available through the legislative process, the funds should be available starting July 1, for the same two-year period as other recommended funds.
    - o Funds are available for recommendation by the commission to address unexpected and urgent needs until they are spent within the two-year period.

o If the funds are not spent for an unexpected and urgent need before the start of the second legislative session within the two-year period, the commission may recommend that they be added to an existing Environmental and Natural Resources Trust Fund project that has a critical need for additional funding to achieve the goals of the project.

Tracking and Preventing Harmful Algal Blooms (HABs)
LCCMR Proposal 037-B

Contact: Daniel Engstrom, Science Museum of MN, dre@smm.org

Harmful Algal Blooms are an Emerging Issue

- HABs represent the most pervasive and serious impairment of surface water quality in Minnesota and across the county.
- HABs threaten recreational use of lakes and lower lakeshore property values.
- The frequency and severity of HABs appear to be increasing in Minnesota Lakes.
- Recent dog deaths from HAB toxins have greatly increased public awareness and concern.
- We currently have a limited ability to predict when HABs will occur, when they will produce toxins, and how long those toxins will persist.
- There are presently few tools in the lake-manager's tool box with which to combat HABs.

How designation of this proposal as an Emerging Issue will accelerate and improve outcomes

- Activity 1 of the project *will assess the relationship between algal communities and water quality in a representative group of Minnesota lakes to determine the distribution, abundance, and seasonality of bloom-forming species.*
- This work will be done for a period of two full years, which to be useful, must begin with the onset of open-water conditions in the spring.
- HABs typically appear in mid- to late-summer, but the conditions leading up to bloom formation cannot be understood without spring and early summer monitoring.
- Funding as an emerging issue would allow the monitoring to begin in spring 2016, the first year of the study. Otherwise, the monitoring effort would be delayed until spring 2017.

Additional activities for which Emerging Issues funding would be used

- Jump-start monitoring in year-1 of the project (April, 2016).
- Extend monitoring period to 7 months (April-October) for each of two years (currently scheduled for 5 months).
- Allow full instrumentation of 5 intensively monitored lakes with recording temperature and oxygen probes to continuously monitor chemical and physical lake conditions over two entire years (currently scheduled for one lake).

Proposed budget (see attached detail)

Personnel:	$42,900
Equipment/Supplies:	$39,500
Field Travel:	$6,500
Lab Analyses:	$3,675
Total:	$92,575

Proposed Start Date: March 1, 2016

- To allow time for equipment purchase and other preparations for start of sampling in April.

A. ENRTF Emerging Issues Budget Detail:

Budget Category	$ Amount	Overview Explanation
Personnel: Adam Heathcote, 0.5%FTE, 0.5 years, $18,400 Mark Edlund, 0.5% FTE, 0.5 years, $24,500	$42,900	Heathcote will lead field coordination and be involved in sample collection and BG algae analysis Edlund will coordinate microscopy laboratory and be involved in sample collection and BG algae analysis
Equipment/Tools/Supplies: YSI multi-sensor sonde for water quality and algal biomass measurements: $20,000 DO probes (x10): $15,000 Temperature probes (x30): $2,000 Pressure (depth) probes (x5): $1,500 Misc. buoy hardware, rigging, and sediment traps: $1,000	$39,500	YSI sonde is necessary piece of sampling equipment for taking water profile measurements during bi-monthly sampling trips DO, temperature, and depth probes will be used to construct and deploy buoys in each of the 5 intensively sampled lakes. These buoys will be in for the entire ice-free season and will collect high-frequency data between sampling events.
Travel Expenses in MN: Field travel to 5 Sentinel Lakes: $6,500	$6,500	5 lakes will be sampled bi-monthly from May-July to capture late spring and early summer conditions, an increasingly important time for algal blooms and toxicity events (human illness, dog deaths)
Other: *Analytical Services at SCWRS:* TN/TP: 42 water samples @ $35 = $1,470 NOx/SRP: 42 water samples @ $35 = $1,470 DOC/DIC: 21 water samples @ $35 = $735	$3675	Water samples collected bi-monthly from 5 lakes that will be analyzed at the SCWRS chemistry laboratory.
TOTAL ENRTF BUDGET:	**$92,575**	

Increasing Harmful Algal Blooms in Minnesota Lakes
LCCMR Proposal 038-B

Contact: Miki Hondzo, University of Minnesota, St. Anthony Falls Laboratory, mhondzo@umn.edu

Upon the recommendation of the Legislative-Citizen Commission on Minnesota Resources, the research teams of University of Minnesota (St. Anthony Falls Laboratory; Proposal 038-B) and the Science Museum of Minnesota (Proposal 037-B) had a meeting at the LCCMR office on November 10, 2015. In order to facilitate collaboration, eliminate duplicate efforts, and amplify synergistic discoveries of harmful algal blooms in Minnesota, researchers established a working agreement of where and when to sample harmful algae in Minnesota lakes. Both research teams agreed that harmful algal blooms are an emerging environmental issue threatening the water resources of Minnesota.

Why are harmful algal blooms (HABs) an emerging issue?

- HABs are have been increasing in Minnesota due to global environmental issues relevant to changes of land use and climate change
- The state of Minnesota, with more than 10,000 lakes and agriculturally dominated landscapes, is prone to HABs
- Research communities have been reporting site specific HABs, however they have not provided a unified scientific explanation of where and when HABs generate excessive toxins, which are detrimental to humans and animals
- The state of Minnesota does not have the scientific tools needed to predict HABs and toxin concentrations in Minnesota lakes
- The state of Minnesota does not have organized educational procedures to promote awareness and minimize impact of HABs

Why could our proposal benefit from earlier funding being classified as an emerging issue?

- HABs and high toxin generations have high spatial and temporal variabilities and therefore require detection technologies which are not available on the shelf. Based on long-term proven experience of water quality monitoring in lakes, we will develop a unique instrumentation for continuous monitoring of HABs in Minnesota lakes. During the requested earlier project period (Feb-Apr, 2016), the instrumentation will be developed and tested to start lake field monitoring Apr-Oct, 2016.
- The requested earlier funding will enable two years of HABs monitoring during the "open water", or "ice-free" season (Apr-Oct). During the proposed sampling time-period (Apr-Oct), we will be able to detect environmental variables which trigger, maintain, and dissipate HABs in Minnesota lakes. Without the requested earlier additional funding, the monitoring effort would be delayed until April 2017.

Additional activities for which emerging issues funding would be used

- For each of the proposed two years (2016, 2017), extending the monitoring period to seven months (Apr-Oct) will provide valuable data for developing (year 1) and verifying (year 2) predictive models of HABs and toxin distributions in Minnesota lakes.
- The proposed early and extended monitoring efforts will enforce the proposed public and educational outreach in the state of Minnesota.

Proposed budget (see attached detail)

Personnel:	$37,518
Equipment/Supplies:	$31,714
Field Travel:	$1,300
Total:	**$70,532**

Proposed start date: February 1, 2016

To allow time for equipment development and testing prior to the field sampling start in April, 2016.

Emerging Issues Budget Detail

Budget Category	$ Amount	Overview Explanation
Personnel: Miki Hondzo (PI), 160 hrs Christopher Ellis 200 hrs Eric Steen 24 hrs Ben Ericson 80 hrs Student 160 hrs	$37,518	Hondzo will lead and coordinate laboratory and field efforts. Ellis will be responsible for designing autonomous cyanobacterial and water quality sensing devices. Ericson will be responsible for deploying the and maintain the field instrumentation
Equipment/Tools/Supplies: Laboratory fluorometer, Turner Design ($7,892); Cyanobacterial autonomous sensing profiler with wireless data transfer and display over the Internet ($10,922) Supplies ($12,000)	$31,740	Laboratory fluorometer will be used to quantify chlorophyll concentration in the experimental setups at the St. Anthony Falls Laboratory Cyanobacterial autonomous profiler will be used in the field. The sampler can provide cyanobacterial concentration profiles over the lake depth and it will have adjustable sampling times and depths over the Internet. The profiler will have a wireless data transfer with display over the Internet.
Travel Expenses in MN: Field travel to deploy instrumentation	$1,300	One lake will be selected for continuous monitoring in the first year. Subsequent continuous lake monitoring will be conducted in collaboration with the Science Museum of Minnesota.
TOTAL ENRTF BUDGET:	**$70,532**	