

## Crust heat flux:

Gradient =792R-495R =297F

Slab thickness =25miles =132,000ft

Thermal conductivity =2Btu/SF/degF/h

$q = k \times dt/dx = 2 \times 297/132,000 = 0.0045 \text{ Btu/SF/h}$

$2q = q \times 365 \times 24 = 0.0045 \times 8760 = 39.42 \text{ Btu/SF pa}$

$3q = 2q \times 1000 = 39.42 \times 1000 = 39,420 \text{ Btu/SF for a thousand years}$

$4q = 3q \times 10 = 39,420 \times 10 = 394,200 \text{ Btu/SF for TEN thousand years}$

To melt ONE pound of ice =500 Btu (approx)

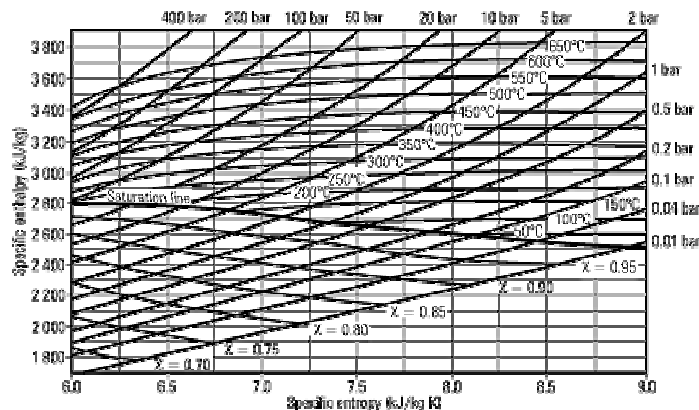
$4q$  will hence melt  $39,420/500 = 7,884 \text{ lb ice in } 10,000\text{y}$

$4q$  will hence result in  $7,884/60 = 131.4 \text{ cubft} = 130\text{ft deep lake!!}$

This will not happen as the ice itself will absorb/conduct part of the heat flux.

Given circumstances the water may boil OR discharged via subterranean geysers.

Subterranean meltdown may conversely spawn 10-20,000 year polar inversion cycles.



Enthalpy - entropy or Mollier chart for steam

193	<u>4.42</u>	52	197	<u>0.0004</u>	2	<u>4500.88</u>	496	798	1097	1393	1684	1970	2253	2533	2811	3090
194	<u>4.44</u>	52	197	<u>0.0004</u>	2	<u>4574.35</u>	496	796	1095	1389	1680	1966	2249	2530	2810	3090
195	<u>4.46</u>	52	197	<u>0.0004</u>	2	<u>4648.95</u>	495	795	1092	1386	1676	1963	2247	2528	2809	3090
196	<u>4.49</u>	52	197	<u>0.0004</u>	2	<u>4724.70</u>	495	794	1090	1383	1673	1960	2244	2527	2808	3090
197	<u>4.51</u>	52	197	<u>0.0004</u>	2	<u>4801.62</u>	495	792	1088	1380	1670	1957	2242	2525	2808	3090
198	<u>4.53</u>	52	197	<u>0.0004</u>	2	<u>4879.73</u>	495	791	1086	1378	1667	1955	2240	2524	2807	3090
199	<u>4.55</u>	52	197	<u>0.0004</u>	2	<u>4959.03</u>	495	790	1084	1376	1665	1952	2238	2522	2806	3090
200	<u>4.58</u>	52	197	<u>0.0004</u>	2	<u>5039.57</u>	495	790	1083	1374	1663	1951	2237	2521	2806	3090

<http://polarequilibrium.com/pdfs/PEQ.Macro29Sep09.pdf>

