Timing of Granite-Migmatite Relations, Sebago Migmatite Domain, Southwestern Maine

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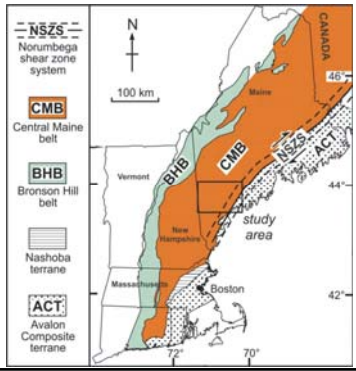
Regional Context

Solar et al. defined a model for melt transit through the crust in W. Maine.

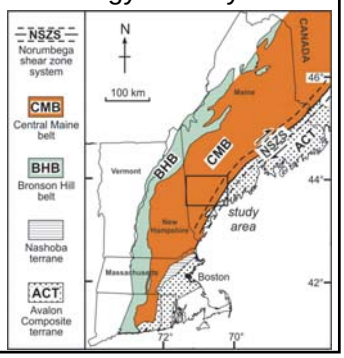
To what extent do similar relations persist in SW Maine?



Don't We Know Everything About New England Geology Already?

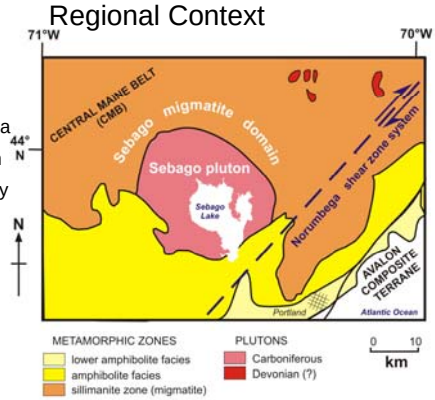
No, amazingly enough.

Particularly in SW Maine, basic elements of our understanding are no better than they were in the 1970's.



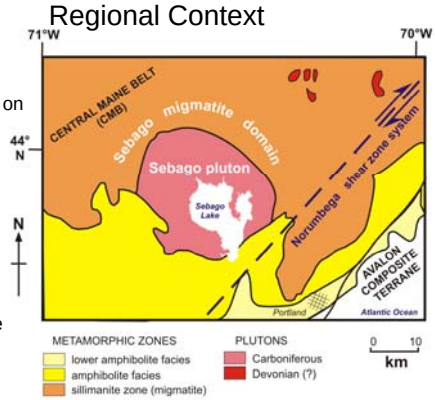
Regional Context

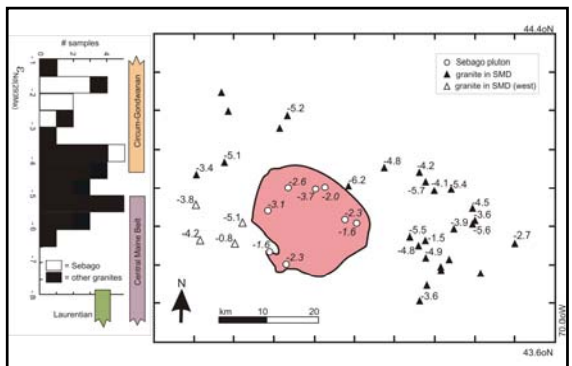
Our previous work defined a granite pluton surrounded by a broad area of migmatitic rocks.



Regional Context

Our current work focuses on potential relations between melting, deformation, and melt transfer in the crust.



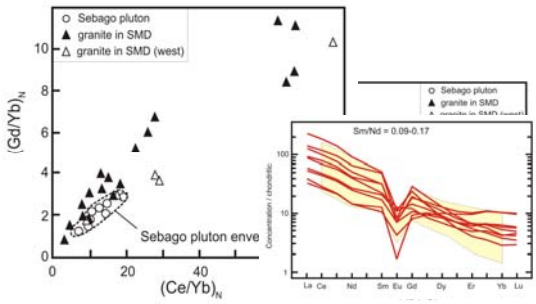


Sebago pluton:
homogeneous textures, trace elements, initial Nd isotopes

Granite Geochemistry

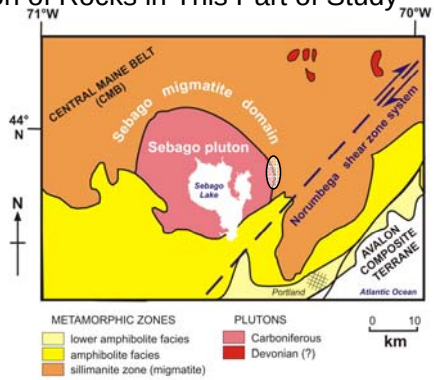
granites in the Sebago migmatite domain:

m to 10's m scale, heterogeneous in texture, schlieric



Location of Rocks in This Part of Study

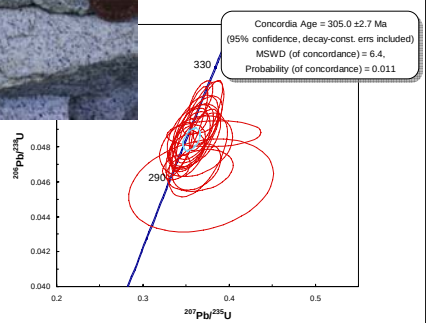
Fortuitous road construction exposed complex series of outcrops on E side of pluton.



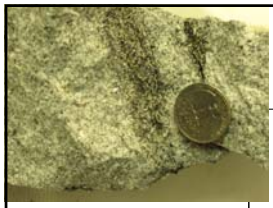
Granite Dike With Magmatic Fabric

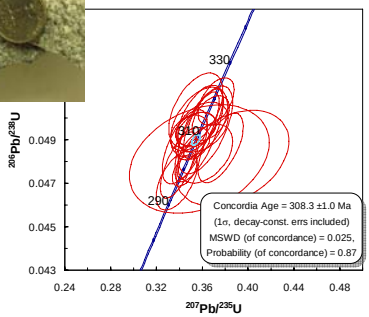
best estimate for crystallization:

305±10 Ma



Equigranular Granite With Micaceous Schlieren

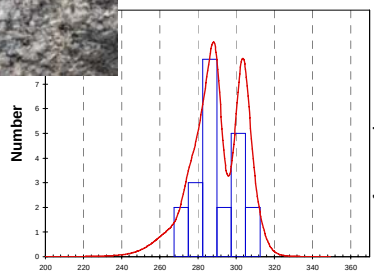




best estimate for crystallization:

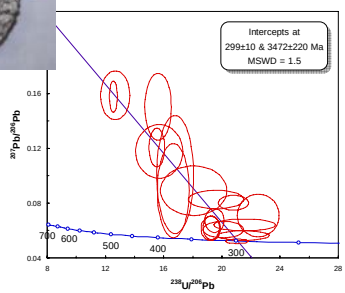
308±9 Ma

Coarse-Grained Granite



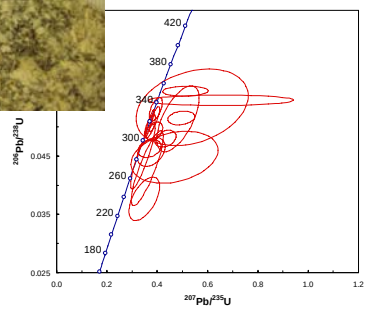
- two age populations distinguishable:
  285±4 Ma
  304±6 Ma

Very Coarse Grained Heterogeneous Granite



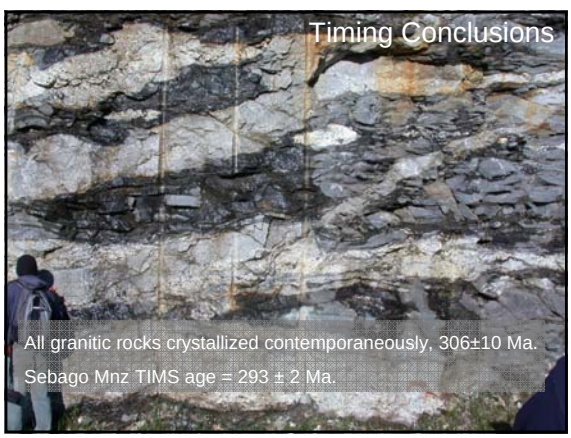
- cloudy, high U, metamict Zrn crystallization ~300 Ma

Pegmatitic Granite With Garnet & Tourmaline



- cloudy, high U, metamict Zrn crystallization ~300 Ma

Timing Conclusions



All granitic rocks crystallized contemporaneously, 306±10 Ma.

Sebago Mnz TIMS age = 293 ± 2 Ma.

Merci!

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