

# Stratigraphy and Structure of the Scotsburn Anticline, Pictou County

Fraser Keppie

Nova Scotia Department of Natural Resources

October 28, 2012

- 1 Geological Mapping
  - Introduction
  - Old Mapping
  - New Mapping
  
- 2 Geological Implications
  - Devono-Carboniferous stratigraphy
  - Alleghenian shortening
  - Mineral exploration

# Talking Points

- Scotsburn anticline is doubly-plunging
  - a saddle and dome are exposed

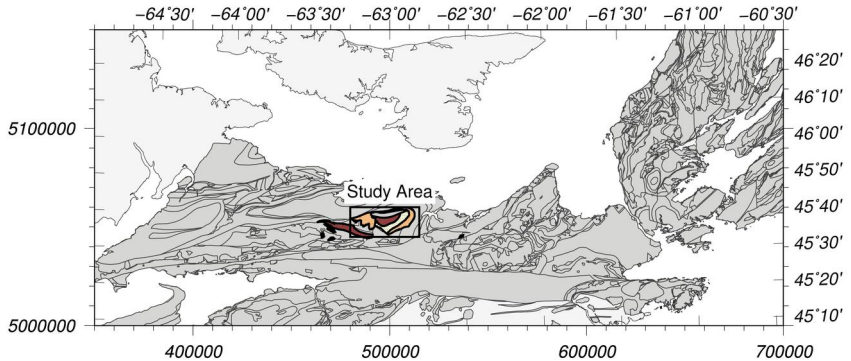
# Talking Points

- Scotsburn anticline is doubly-plunging
  - a saddle and dome are exposed
- Two Diamond Brook Formation(s)
  - (lower facies) mostly mafic volcanic in the central Cobequids
  - (upper facies) mostly sedimentary in Scotsburn anticline

# Talking Points

- Scotsburn anticline is doubly-plunging
  - a saddle and dome are exposed
- Two Diamond Brook Formation(s)
  - (lower facies) mostly mafic volcanic in the central Cobequids
  - (upper facies) mostly sedimentary in Scotsburn anticline
- A preliminary mineral exploration model!
  - in magnetic basement underlying the Scotsburn dome

# Location Map



# Old Mapping

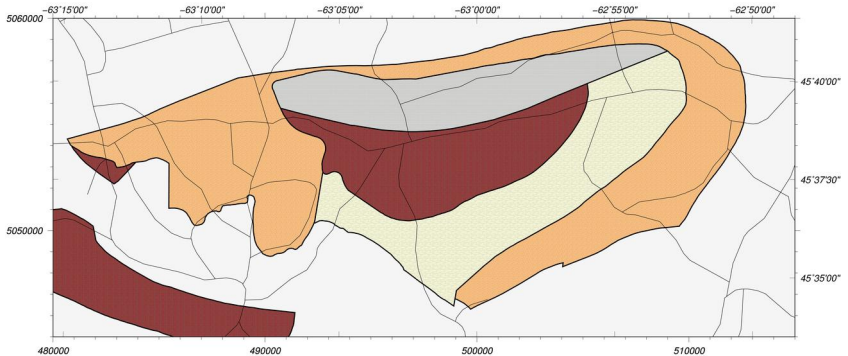
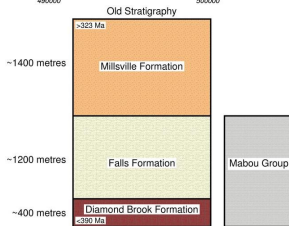
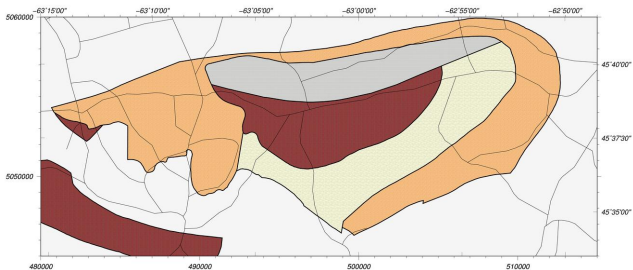


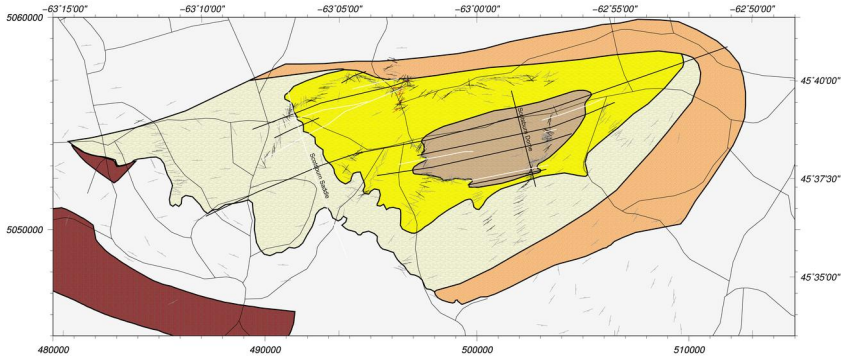
Figure: Donahoe & Wallace (1982)

# Old Mapping

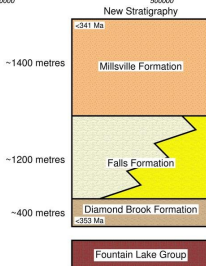
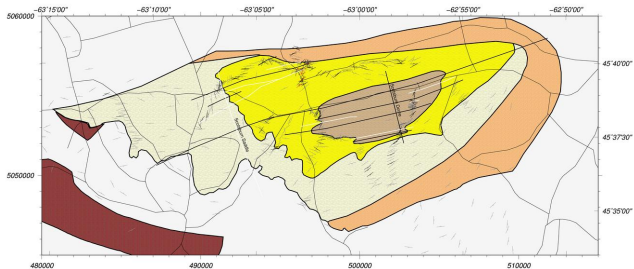




# New Mapping



# New Mapping



# Diamond Brook Formation (upper & lower facies)<sup>1</sup>

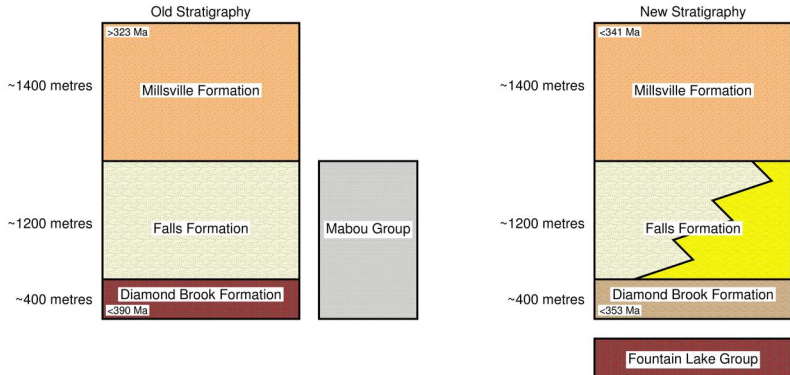
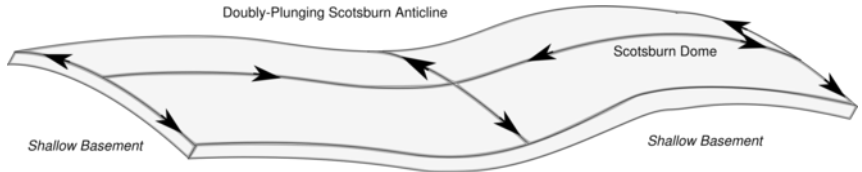
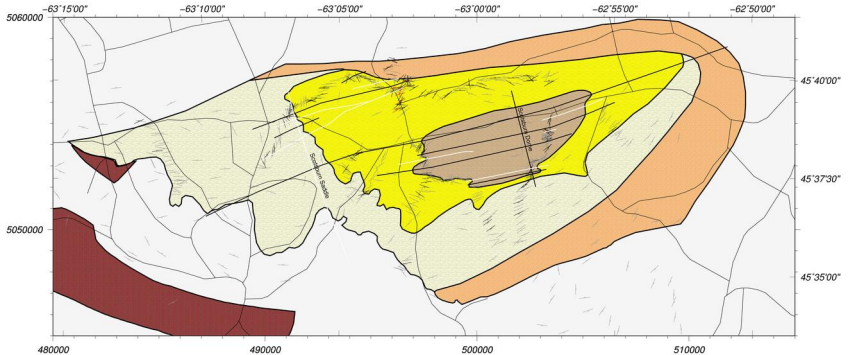


Figure: Pe-piper & Piper (2002)

# Scotsburn Anticline is doubly-plunging



# New Mapping



# Alleghenian shortening

- Fyson, 1964
  - doubly-plunging, upright folding in Parrsboro Basin

# Alleghenian shortening

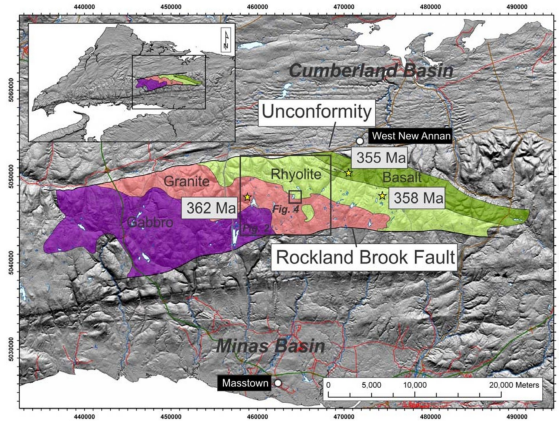
- Fyson, 1964
  - doubly-plunging, upright folding in Parrsboro Basin
- Keppie, 2010
  - doubly-plunging, upright folding in Windsor-Kennetcook Basin

# Alleghenian shortening

- Fyson, 1964
  - doubly-plunging, upright folding in Parrsboro Basin
- Keppie, 2010
  - doubly-plunging, upright folding in Windsor-Kennetcook Basin
- This study
  - doubly-plunging, upright folding in Scotsburn anticline

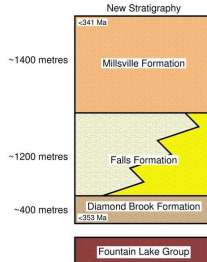
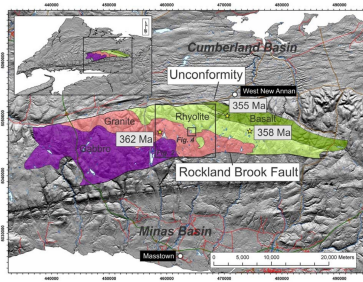


# Mineral exploration



**Figure:** Byers Brook REE (MacHattie, 2010); Lower Diamond Brook Formation epithermal Au (MacHattie, 2011). Figure from MacHattie, 2010).

# Mineral exploration



# Mineral exploration

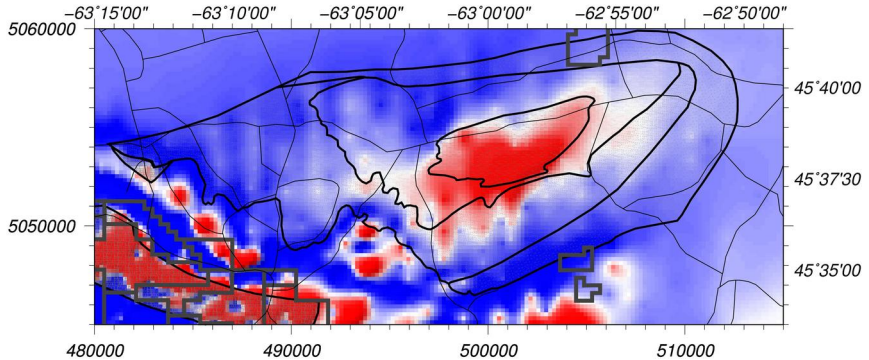


Figure: Magnetic basement (near surface) under Scotsburn Dome

# Conclusions

- Scotsburn anticline is doubly-plunging
  - a saddle and dome are exposed

# Conclusions

- Scotsburn anticline is doubly-plunging
  - a saddle and dome are exposed
- Two Diamond Brook Formation(s)
  - (lower facies) mostly mafic volcanic in the central Cobequids
  - (upper facies) mostly sedimentary in Scotsburn anticline

# Conclusions

- Scotsburn anticline is doubly-plunging
  - a saddle and dome are exposed
- Two Diamond Brook Formation(s)
  - (lower facies) mostly mafic volcanic in the central Cobequids
  - (upper facies) mostly sedimentary in Scotsburn anticline
- A preliminary mineral exploration model!
  - in magnetic basement underlying the Scotsburn dome

# Thank you

- Acknowledgements

- Carla Dickson (Dalhousie)
- Chris White, Trevor MacHattie, John Calder, Bob Ryan (NSDNR)

- References

- Fyson (1964): Repeated trends of folds and cross-folds in Palaeozoic rocks, Parrsboro, Nova Scotia
- Donohoe & Wallace (1982): Geological map of the Cobequid Highlands, Colchester, Cumberland, and Pictou counties, Nova Scotia, Sheet 4 of 4
- Pe-piper & Piper (2002): A synopsis of the geology of the Cobequid Highlands, Nova Scotia
- NSDNR (2006) DP ME 6, Version 2, 2006, Airborne magnetometer survey images, total field and vertical gradient images covering 11D, 11E, 11F, 11G, 11J, 11K, 11N, 20O, 20P, 21A, 21B and 21H (200 m x 200 m resolution)
- Keppie (2010): Five preliminary hypotheses for new mapping in the Windsor-Kennetcook Basin, Central Nova Scotia
- MacHattie (2010): Nature and setting of Late Devonian-Early Carboniferous Rare Earth Element Mineralization in the Eastern Cobequid Highlands, Nova Scotia
- MacHattie (2011): Report on the investigations into a newly discovered gold occurrence at Warwick Mountain in the Cobequid Highlands, Nova Scotia