Mitch’s paper

* Introduction
  + Overview of current OP skill (covered in Chapter 2)
  + **Overview of PM skill**
  + Necessity for regional predictions (covered in Chapter 2)
  + **Apples-to- apples comparison**
* Experimental Design
  + The dynamical model (covered in Chapter 2)
  + **The control integration**
    - **Spin up, last 150 of 450 years**
    - **Initialization differences**
  + **Perfect model experiment**
  + Retrospective seasonal predicton experiments (refer to Chapter 2)
  + Operational Skill metrics (refer to Chapter 2)
  + **Perfect Model Skill metrics**
  + **Significance testing (can likely be rolled into metrics)**
* Pan-Arctic predictability
  + Pan-Arctic SIV
  + *State-dependence of SIV predictability*
  + Unbiased estimate of perfect model ACC (not applicable – will be mentioned in Experimental design)
  + **Pan-Arctic SIE predictability**
* Regional sea-ice predictability
  + SIC predictability
  + **Regional SIE predictability**
  + **Interpretation of PM/OP Skill gap**
* Conclusion

Chapter 3

* Introduction
  + Overview of PM skill
  + Apples-to- apples comparison
* Experimental Design
  + The control integration
    - Spin up, last 150 of 450 years
    - Initialization differences
  + Perfect model experiment
  + Perfect Model Skill metrics
  + Significance testing (can likely be rolled into metrics)
* Results and Discussion
  + Pan-Arctic SIE predictability
  + Regional SIE predictability
  + Interpretation of PM/OP Skill gap
  + Comparions with Bushuk et al. 2019
* Conclusion

Themes:

* Pan-Arctic SIE predictability
  + Autocorrelation comparison indicates that the PM skill is overestimated
  + Despite, this the PM model shows lower skill than expected and confirms the low skill finding in Day et al 2016 (APPOSITE)
  + January and July intialized forecasts form the two lobes of high skill (ACC > 0.7) as was also seen in FLOR
  + The spring predictability barrier is clearly visible in the PM, however, even in spite of overestimation of PM skill, the PM/OP difference plot shows little evidence of a spring predictability skill gap.
  + The PM-OP skill gap appears to be most concentrated in winter initializations of the end of the growth season (although overestimation of the PM should be considered)
* Regional SIE predictability
  + The majority of regions see their predictability drop off dramatically after six months with only sparse and sporadic significantly skillful forecasts
  + The Barents sea is an exception with high predictability out to lead 12 for some months
  + The Labrador sea demonstrates high predictability for April at lead 35 and significant skill for December through May at that lead time.
  + The spring predictiability barrier is evident in all the North Pacific seas and the Central Arctic despite “perfect” SIT initialization which explains why the improved initialization is not a panacea in every region as shown in Chapter 2.
* Interpretation of PM/OP Skill gap
  + Based on autocorrelation comparison between the PM and OP, only the PM skill of the seas on the Pacific side of the Arctic (Kara Sea, Laptev, East Siberian, Chukchi, Bering, Beaufort) as well as Hudson Bay can be used to assess the skill gap of CanCM4.
  + The one exception is the Barents Sea where based on autocorrelation, the PM underestimates the skill yet the OP still has higher skill.
  + The Kara and Beaufort Seas as well as Hudson Bay show the smallest skill gap
  + The Laptev, East Siberian, and Chukchi Seas show a modest skill gap
  + The Bering Sea presents the largest skill gap of any region.
* Comparions with Bushuk et al. 2019
  + Our methodology for picking start years appears to have reduced the high skill bias seen in the PM models of Bushuk et al.
  + GFDL-FLOR’s PM shows higher skill on the pan-Arctic scale and in all regions other than the Labrador Sea.
  + The seas nearer to the Pacific appear inherently less predicatable relative to those nearer to the north Atlantic as was also seen in FLOR.
  + Far more substantial indications of sampling error are seen than in GFDL in particular OP ACCs substantially larger than the PM (Laptev Sea August Lead 9, September Lead 10) as well as PM skill not decaying monotonically with lead time in several regions and on the Pan-Arctic scale