

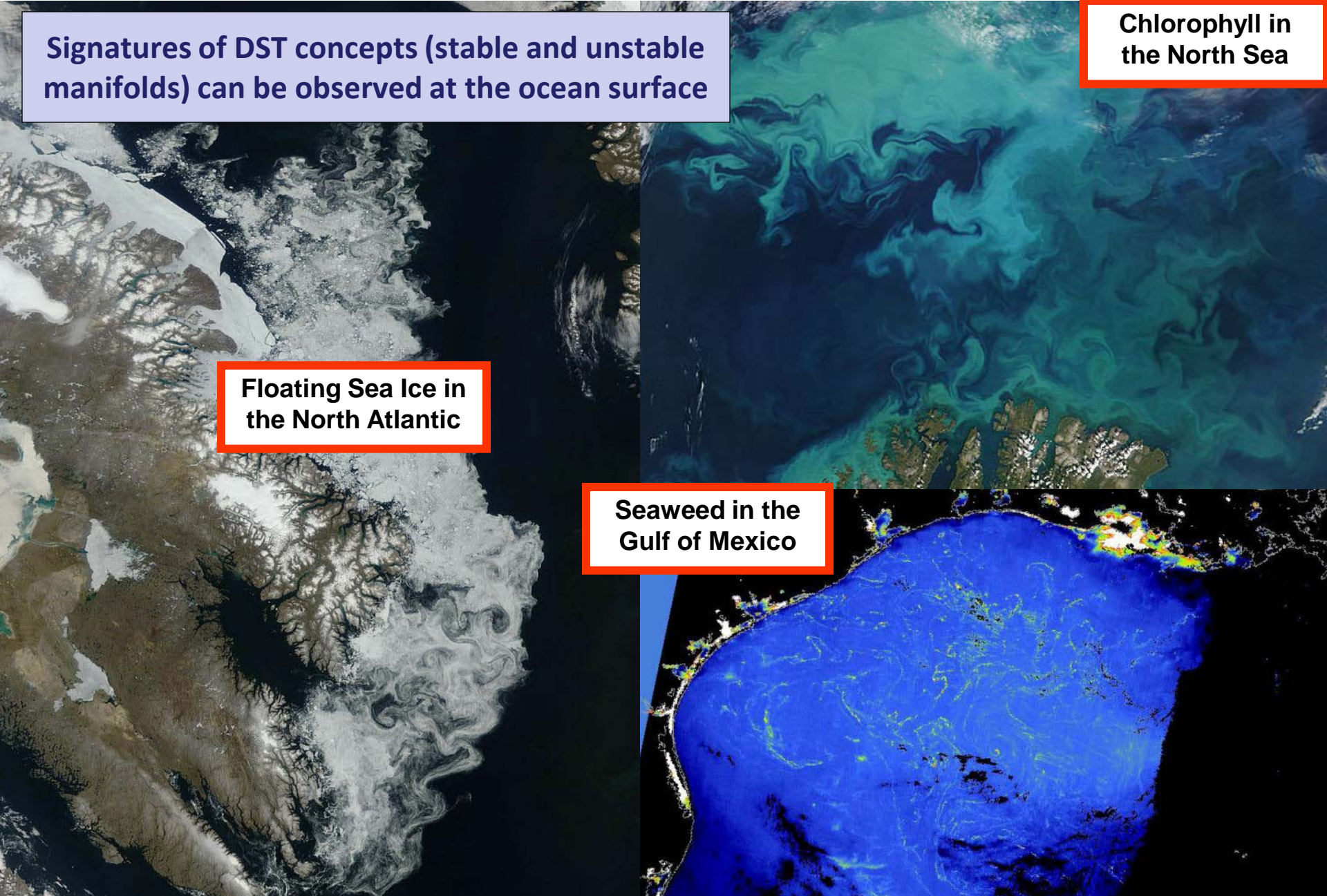
Dynamical Systems Theory for 4D Geophysical Fluid Dynamics

Signatures of DST concepts (stable and unstable manifolds) can be observed at the ocean surface

Chlorophyll in the North Sea

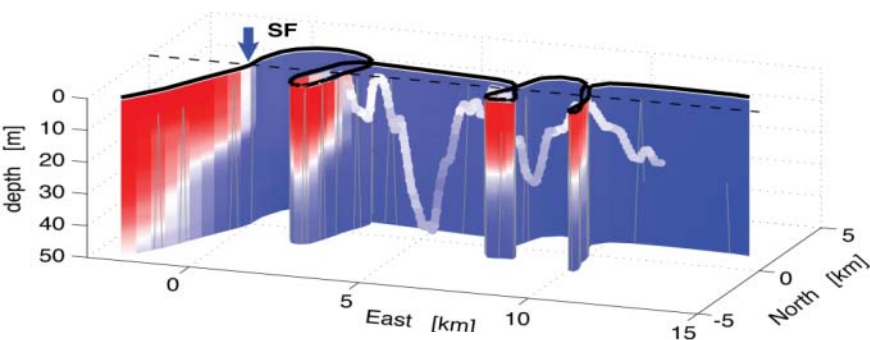
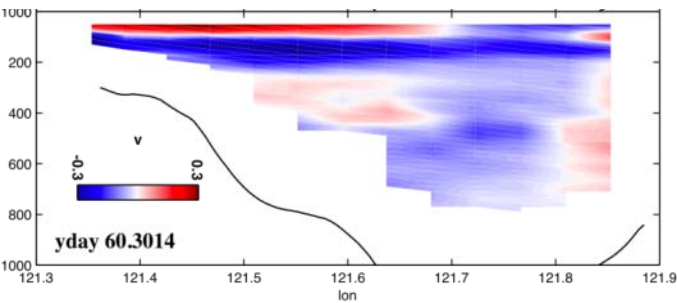
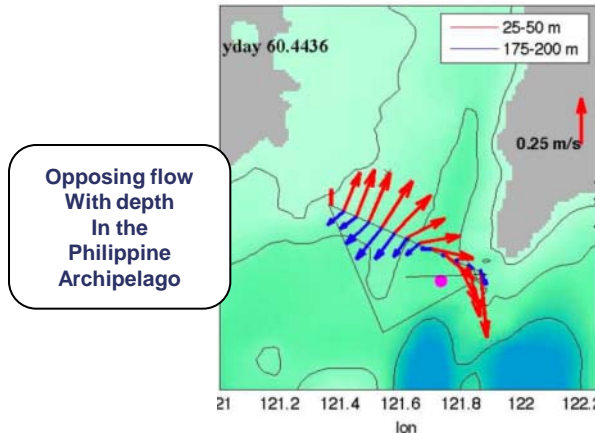
Floating Sea Ice in the North Atlantic

Seaweed in the Gulf of Mexico

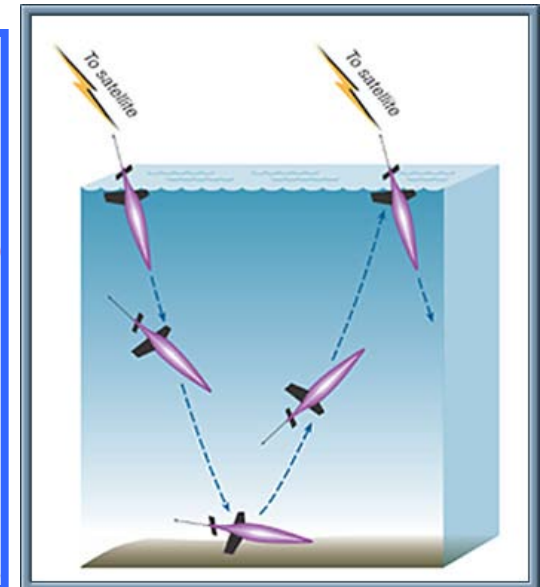
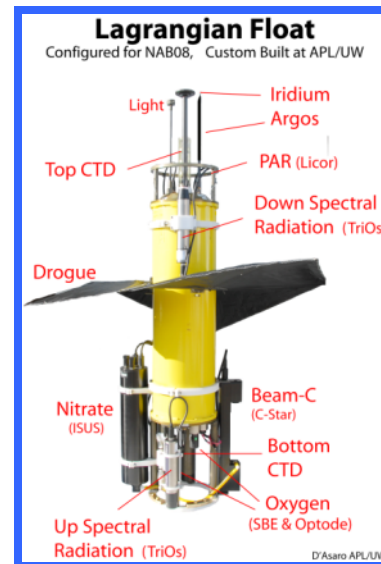


Why do we need to expand the dimensionality of Dynamical Systems Theory?

- Real flow in the ocean is 4d (fronts, shears, topographic features, tides)
- Many interesting ocean processes are not barotropic nor locked to the surface
- Most of the ocean displays baroclinic (sheared) flow – a 2d representation is rarely a sufficient description of velocity
- Oceanographic sampling platforms (unmanned underwater vehicles) can operate at different depths



Vertical excursions of a float along frontal interface



MURI Programmatic Notes

1. \$

2. Option Review

3. ASN(R&E) Review

MURI Programmatic Notes

1: \$

- Current grant is for 3 years (years 4 and 5 are options)
- Initial FY12 funds *finally* went out last week
 - \$348,014 has been sent under 12PR03605-00
 - An additional \$1,044,042 will come under 12PR03605-01

MURI Programmatic Notes

2: Option Review

Option review “after three years” to decide on Years 4&5

- Functionally, this *may* mean as early as Nov/Dec 2012
- Everyone expected to attend
- One or two day meeting in the DC area
- Review panel consists of reps from different agencies
 - Other science agencies, DoD labs, etc (NSF, DARPA, NRL)
- ONR selects reviewers
- The external review panel provides:
 - Assessment of progress
 - Suggested direction and guidance for final years
- Successful completion ‘turns on’ final two years of money

MURI Programmatic Notes

3: ASN(R&E) Review

- The Assistant Secretary of the Navy for Research and Engineering has formal oversight of the MURI program
- So, ASN(R&E) may also request a review
 - Non-decisional (just “show and tell”)
 - Last year it was held in August 2011 for MURIs that started in FY09
 - This MURI might be considered “FY10” because that is when the decisions were made (even though no money went out until FY11), so might have to participate in the ASN(R&E) review this summer
 - Be ready and responsive if asked to present
 - Probably just the lead PI would need to attend
 - Only one presentation – a 20 minute, “big picture” overview
 - Scientific objective and approach
 - MURI team members
 - Accomplishments, breakthroughs, etc
 - Funding profile