What is the problem?

- Not much is there in terms of efficient networking schemes
  - Not deployed in real scenarios
  - Not even in paper studies
- Not convinced? Compare it with RF…
  - A lot more is published and implemented
  - Much more complicated systems, both in research and in practice
- Possible reasons:
  - Small research community
  - Lack of consensus on what is needed
  - Acoustic networks hard to model?
  - Hard to experiment
- How to bridge this gap?

Modeling underwater acoustic network

- Is it that hard? Why?
- Unlike in radio, there are no well-established models for acoustic propagation and channel behavior
  - Very erratic and hard to model, lack of interest?
  - Some disconnect between acousticians and comms engineers?
- How valuable are analytical models?
  - Quick results for initial design, identify trends, etc., but very rough
  - Does the community value these? What can be done with them?
- How valuable are experimental results?
  - Represent reality as it is, but do not necessarily help to understand
  - Hard to get, difficult to replicate, may be very ad hoc and limited
  - What kinds of metrics are of interest?
- So, is there a role for simulation and high-level modeling?

Towards networking-oriented channel modeling

- Goal: develop an accurate simulator for realistic evaluations of UW acoustic networks
- Include protocols as well as reasonable PHY representation
- Statistical analysis of data to reveal behaviors and come up with some stochastic models and/or guidelines
  - Issues related to correlations due to the need to simulate simultaneous links
  - Time correlations, stationarity, periodicity as well
- Role of experiments: test specific solutions vs. build models
- Use of traces for simulations (maybe)
- Develop some "typical" channels
- What type and how much data is needed?
- WOSS: an example of (reasonable?) trade-off
  - Using ns2 wireless models just with increased delays makes no sense
  - Claiming that every physical effect needs to be included makes no sense either
  - How do network behaviors REALLY depend on propagation effects?
  - How to develop a "good enough" model with minimal effort?

Some possible initiatives

- How to enlarge the community?

- Make data sets available (who, where, how?)
- Define a set of "standard" case studies/scenarios?
- Establish one (a few?) common tools/platforms/environments
- Deploy programmable/reusable/accessible testbeds
- Promote discussion (does WUWNET help? Who else?)

- Final question: $$$ Where is funding to be found?