

An International Symposium:

***“Potential Application of Vessel-Quieting Technology on
Large Commercial Vessels”***



1-2 May, 2007

**NOAA Main Campus, Science Center
1305 East-West Highway
Silver Spring, MD 20910**

Convened by:

NOAA Ocean Acoustics Program, Brandon L. Southall (Director)

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Office of Science and Technology

Marine Ecosystems Division

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BACKGROUND

The issue of anthropogenic sound and its effects on marine life is one of increasing public and scientific interest. Our understanding of many relevant questions has expanded rapidly in some areas, although considerable scientific uncertainty generally remains. In 2004, NOAA and a number of other government, industry, and academic partners convened the first formal meeting (“Shipping Noise and Marine Mammals: A Forum for Science, Management, and Technology”) to consider the effects of sounds from large vessels on marine life (see: www.nmfs.noaa.gov/pr/acoustics/). While it was collectively acknowledged that there are many uncertainties and complexities regarding the potential effects of vessel sounds, there was clear agreement that sound introduced into the environment will, at some level, have various effects on marine life. It was also acknowledged that large vessels represent a significant (and in some areas predominant) contribution to overall ambient noise in certain (primarily low) frequency bands. The potential for interference (“masking”) with marine animal communication signals occurs where there is overlap between vessel noise and marine animal calls. Marine animals that produce signals most likely to be masked by large vessel sounds include the large whales, some seals and sea lions, and most fish.

Sound produced as an incidental byproduct of vessel operation serves no particular function in the transportation of goods. Thus, given the potential interference with acoustic communication in marine life, an important question is whether sound output from large vessels can be realistically reduced. Of course, there are both technical and practical considerations bearing on this question. A key action item identified by an expert panel and audience forum at the 2004 symposium was to explicitly consider whether vessel-quieting applications in other contexts (*e.g.*, military vessels and fisheries research) can be feasibly scaled up for use on much larger commercial vessels. Further, it was noted that economic aspects of any such applications (in terms of costs and any benefits related to efficiency or on-board noise reduction) must be specified. It was suggested that for vessel operators, noise may, in certain circumstances, be undesirable in that it may be hazardous or annoying to on-board crew or passengers and/or it may reflect propulsion inefficiency. However, others noted that vessel builders and operators are continually striving to increase efficiency and question any economic benefits that could theoretically offset the costs of retrofitting or designing quieter vessels.

The overarching aim of the 2007 symposium is for subject-matter technical experts to provide an objective assessment of the feasibility and economic aspects of various quieting applications for vessel designers, builders, owners, and operators. The symposium will be organized and conducted toward achieving the objectives specified below.



2007 NOAA VESSEL-QUIETING SYMPOSIUM OBJECTIVES

This symposium will not focus on the deliberate application of active acoustic sources on most vessels (*e.g.*, echosounders). Rather, it will consider the incidental sound radiated in the course of vessel operations. Neither is the symposium intended to revisit in any great detail, questions regarding potential effects of sound on marine life that are acknowledged to be largely unresolved, nor regulatory considerations concerning anthropogenic sound.

The symposium will largely put these overarching issues aside, presume that there may be certain environmental benefits to having quieter vessels without attempting to unequivocally define them, and achieve the following objectives:

- **Specify** rationale and explicit target levels for quieting for vessels of various classes; *consider* how targets may vary in different geographical areas.
- **Determine** (to the extent possible) whether known/existing vessel-quieting technologies used in other applications have the potential to achieve these goals for large commercial vessels.
- **Determine** (to the extent possible) the likely costs and any tangible benefits associated with the application of the various technologies on existing ships (retrofitting) and in vessel construction.
- **Produce** a formal report summarizing progress on the above objectives; *synthesize* findings into a “menu” format of the feasibility, costs, and benefits of various vessel-quieting options in different geographical areas.



2007 NOAA VESSEL SYMPOSIUM LOGISTICS

The symposium is **open** to any and all interested parties and there is **no registration fee**. However, the organizers would *appreciate advance notice* if you plan to attend the symposium (please email: Brandon.Southall@noaa.gov or call 301-713-2363 x163 and you will be pre-registered and added to the email distribution list regarding the symposium). This is particularly important if you are not a U.S. citizen. You will need to present an official form of identification at the security desk just outside the meeting room.

The symposium will take place in the NOAA Science Center, which is located on the main NOAA campus in Silver Spring, MD. There are four primary NOAA buildings on East-West Highway near the intersection with Colesville Rd just south of downtown Silver Spring. The NOAA campus is adjacent to the Silver Spring Station on the **RED** line of the Metro and MARC light-rail. The Science Center is adjacent to Building IV (address: 1305 East-West Hwy) and in the same building as the NOAA Auditorium.

If you are traveling to the Washington DC area for the symposium, there are three airports that are approximately equidistant from Silver Spring. Washington-Reagan airport (DCA) is located near downtown DC and is convenient via Metro to Silver Spring. Baltimore-Washington airport (BWI) is located close to Baltimore but requires a bus to the Metro. Dulles International Airport (IAD) is located in rural Virginia and basically requires a taxi or rental car. Taxi from any of these airports to Silver Spring is on the order of \$50-75, although there are some shared shuttle services.

In terms of lodging in the Silver Spring area, there are a number of hotels easily located on-line. The two most commonly used by visitors to NOAA are:

Silver Spring Hilton

www.hilton.com

8727 Colesville Road, Silver Spring

(301) 589-5200

Holiday Inn Silver Spring Plaza

www.crowneplaza.com

8777 Georgia Ave # 1, Silver Spring

(301) 589-0800

Be sure to ask for the government rate if you qualify for this, as each offers rates within government allowable per diem for the DC area.

ACKNOWLEDGEMENTS

The symposium conveners gratefully acknowledge the many individuals and organizations that have assisted in making this symposium a cooperative reality. This includes those who served on the steering committee to develop the objectives and identify speakers at the symposium. The session chair would like to specifically acknowledge the assistance of Dr. Leila Hatch, Dr. Amy Scholik, Ms. Lindy Johnson and Ms. Kathy Metcalf in the planning phases of the symposium. Finally, attendees and speakers should note that Dokumente des Meeres (GmbH) will be filming portions of this open symposium in the context of their documentary film; they have kindly assisted by supporting travel expenses for several speakers traveling internationally to the symposium.



DOKUMENTE DES MEERES



2007 NOAA Vessel-Quieting Symposium Agenda Tuesday, 1 May 2007

Session I – Introduction: meeting objectives, vessel acoustics, ambient noise, and biology

[Symposium/Session Chair: **Dr. Brandon Southall** (NOAA Ocean Acoustics Program)]

~ **Session I Objective:** *Specify general biologically-relevant targets for vessel-quieting and data needs regarding vessel sound production and contributions to ambient noise* ~

0830 “General introduction: Recap of 2004 symposium and overview of agenda, objectives, and products of current vessel-quieting symposium”

* **Dr. Brandon Southall** (NOAA Ocean Acoustics Program) *

0845 “Perspectives on marine acoustics from a shipping industry representative”

* **Ms. Kathy Metcalf** (Chamber of Shipping of America) *

0900 “Large vessels as point sound sources: Characteristics of radiated sound and marine ambient noise in nearshore/continental shelf environments”

* **Dr. John Hildebrand** (Scripps Institute of Oceanography) *

0920 “Measured radiated sound from large commercial vessels: Controlling sources of radiated noise from large modern cruise ships and dependence on propulsion type and vessel speed”

* **Mr. Blair Kipple** (Naval Surface Warfare Center, Bremerton Detachment) *

0940 “ASA standards committee (WG47) on measurements of vessel radiated noise”

* **Mr. Michael Bahtiarian** (Noise Control Engineering) *

1000

COFFEE BREAK

1020 “Effects of distant shipping on ambient noise in the open ocean”

* **Dr. Roy Gaul** (BlueSea Corporation) *

1040 “Biological functions of acoustic communication and noise impacts”

* **Dr. Douglas Nowacek** (Florida State University) *



1100 “Some philosophies about shipping noise and porpoises”

* **Mr. Willem Verboom** (SEAMARCO/TNO, The Netherlands) *

1120 *Working Groups (All attendees welcome: self-selecting)*

1) *Identify* biological-related objectives (target levels) for vessel-quieting

* Group leader: **Dr. Douglas Nowacek** (FSU) *

2) *Summarize* state of knowledge and data needs re: vessel sound fields and ambient noise measurements in pelagic and littoral environments

* Group leader: **Dr. Edmund Gerstein** (Florida Atlantic Univ.) *

1230

LUNCH

Session II – Feasibility and estimated costs/benefits of applying existing and future quieting technologies to large commercial vessels

[Session Chair: **Dr. Roger Gentry** (ProScience Consulting)]

~ **Session II Objective:** *Identify existing/future quieting technologies and develop a rank-order assessment of feasibility and potential costs/benefits in large vessel applications*

1330 “Existing/future technology to address radiated sound from internal machinery (fisheries research vessels) – applications to large commercial vessels”
* **Mr. Ray Fischer** (Noise Control Engineering)

1410 “Existing/future technology to address radiated sound by modifying vessel-operating parameters (e.g., speed) and propeller type/motion – applications to large commercial vessels”
* **Dr. Neal Brown** (NAB Associates) *

1450 **COFFEE BREAK**

1510 “Shipboard noise control”
* **Mr. Kurt Yankaskas** (NAVSEA 03) *

1550 “Industry perspective on potential costs/economic benefits of vessel-quieting technologies (e.g., effects on fuel usage, efficiency) for large vessels”
* **Dr. Dietrich Wittekind** (DW-ShipConsult) *

1630 **Plenary Discussion** (Leader: **Dr. Neal Brown**, NAB Associates)
1) Evaluate existing applications and identify those likely feasible for large commercial vessels (including retrofitting vs. new construction and vessel type comparisons)
2) Assess which applications are most likely to achieve quieting targets in session
3) Summarize and assess economic costs/benefits of vessel-quieting applications

1730 **END of DAY I**

Wednesday, 2 May 2007

Session III – Non-regulatory incentives to reduce sound emission from large commercial vessels

[Session Chair: **Dr. Leila Hatch** (Stellwagen Bank National Marine Sanctuary)]

~ **Session III Objective:** *Assess/summarize potential alternative (other than direct economic) benefits of applying vessel-quieting technologies*

0830 “Workplace compliance/crew safety issues”
* **Mr. Kurt Yankaskas** (NAVSEA 03) *

0850 “Managing environmental aspects of large passenger vessels”
* **Mr. Dodge Kenyon** (Manager, Maritime Affairs, Holland-America Cruise Line) *

0910 “Sound carries: A Lesson for publicizing that you are part of the green solution”
* **Ms. Constance Bruce** (Director, Marketing & Communications, Special Media Projects Cornell Lab of Ornithology) *

0930 “Benefits to recreational divers of vessel-quieting applications”
* **Mr. Steve Sellers** (Director of Diving and Water Safety, East Carolina University and President, American Academy of Underwater Sciences) *



