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No. 7-27

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The Marine Corps  
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## **DESERT OPERATIONS**

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## PREFACE

FM 90-3/FMFM 7-27 is the Army's and Marine Corps' manual for desert operations. It is a key reference for commanders and staffs regarding how the desert affects personnel, equipment, and operations. It will assist them in planning and conducting combat operations in desert environments.

This manual complies with the contents of NATO Standardization Agreement (STANAG)/Quadripartite Standardization Agreement (QSTAG).

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Unless this publication states otherwise, masculine nouns and pronouns do not exclusively refer to men.

## INTRODUCTION

Arid regions make up about one-third of the earth's land surface, a higher percentage than that of any other type of climate. As we have seen in the recent past, some of these regions—because of diverse and conflicting cultures, strategic importance, and natural resources—have become centers of conflict.

Military leaders have long recognized the potential for US involvement in conflict in these regions. Exercises at the Army's National Training Center, Fort Irwin and the Marine Corps' Marine Air Ground Combat Center, Twentynine Palms, California, have provided an opportunity for virtually all our ground forces to experience desert conditions. The success of Operation Desert Storm can be directly attributed to this realistic training.

Desert operations demand adaptation to the environment and to the limitations imposed by terrain and climate. Success depends on an appreciation of the effects of arid conditions on soldiers (both physically and psychologically), on equipment and facilities, and on combat and support operations. Leaders and soldiers must continually evaluate the situation and be ready to react to changing conditions. Equipment and tactics must be modified and adapted to a dusty, rugged landscape where temperatures vary from extreme highs to freezing lows and where visibility can change from 30 miles to 30 feet in a matter of minutes.

The key to success in desert operations is mobility. This was clearly evident in the ground operations of Desert Storm. The tactics employed to achieve victory over Iraq were wide, rapid flanking movements similar to those executed by Montgomery and Rommel during World War II. During Desert Storm, however, new technologies increased higher-echelon headquarters' ability to target, attack, and fight deep operations simultaneously. Modern weapon systems like the M1A1 Abrams tank, Bradley fighting vehicle, light armored vehicle, and assault amphibious vehicle, coupled with newly developed navigation and targeting devices, contributed immeasurably. Tactical units were able to fight battles with minimal direction; leaders were able to exercise initiative based on a clear understanding of their commanders' intent. Current doctrine—focused on improving mobility and implemented through the planning, preparation, and execution processes, battle drills, and tactical SOPs, paved the way for the overwhelming triumph.

Arid regions create both opportunities and restraints for soldiers and marines at all levels. The US military's performance in Desert Storm shows it understands these factors and has successfully addressed the effects of desert warfare on troops, equipment, and operations. As they prepare for the future, leaders, soldiers, and marines must study past campaigns and use the lessons they learn to reduce casualties, use the environment to their advantage, and ensure victory on the desert battlefield.

CHAPTER 1  
**THE  
 ENVIRONMENT  
 AND ITS EFFECTS  
 ON PERSONNEL  
 AND EQUIPMENT**

This chapter describes the desert environment and how it affects personnel and equipment.

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### **Section I. The Environment**

Successful desert operations require adaptation to the environment and to the limitations its terrain and climate impose. Equipment and tactics must be modified and adapted to a dusty and rugged landscape where temperatures vary from extreme highs down to freezing and where visibility may change from 30 miles to 30 feet in a matter of minutes. Deserts are arid, barren regions of the earth incapable of supporting normal life due to lack of water. See Figure 1-1 for arid regions of the world. Temperatures vary according to latitude and season, from over 136 degrees Fahrenheit in the deserts of Mexico and Libya to the bitter cold of winter in the Gobi (East Asia). In some deserts, day-to-night temperature fluctuation exceeds 70 degrees Fahrenheit. Some species of animal and plant life have adapted successfully to desert conditions where annual rainfall may vary from 0 to 10 inches.

Desert terrain also varies considerably from place to place, the sole common denominator being lack of water with its consequent environmental effects, such as sparse, if any, vegetation. The basic land forms are similar to those in other parts of the world, but the topsoil has been eroded due to a combination of lack

of water, heat, and wind to give deserts their characteristic barren appearance. The bedrock may be covered by a flat layer of sand, or gravel, or may have been exposed by erosion. Other common features are sand dunes, escarpments, wadis, and depressions. This environment can profoundly affect military operations. See Figure 1-2 for locations of major deserts of the world, and Appendix A for additional information on desert countries of the world.

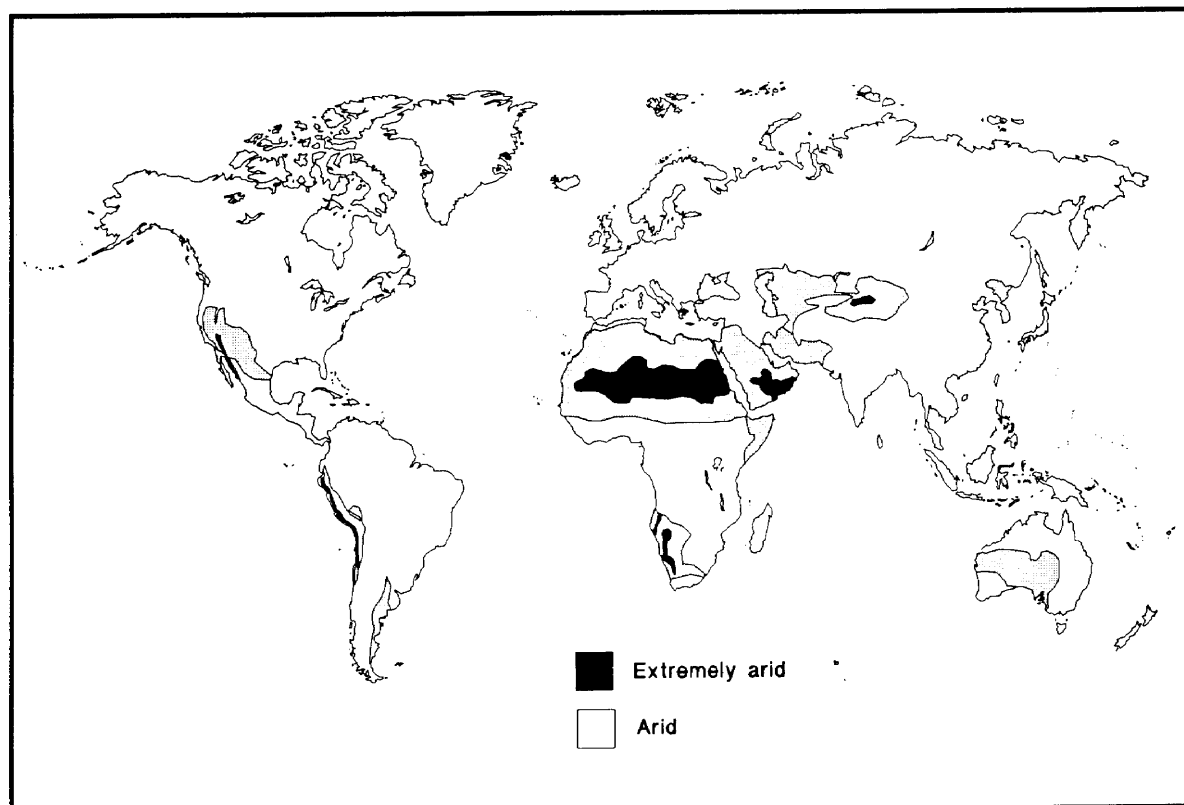


Figure 1-1. Deserts of the world.

It is important to realize that deserts are affected by seasons. Those in the Southern Hemisphere have summer between 21 December and 21 March. This 6-month difference from the United States is important when considering equipping and training nonacclimatized soldiers/marines for desert operations south of the equator.

## TERRAIN

Key terrain in the desert is largely dependent on the restrictions to movement that are present. If the desert floor will not support wheeled vehicle traffic, the few roads and desert tracks become key terrain. Crossroads are vital as they control military operations in a large area. Desert warfare is often a battle for control of the lines of communication (LOC). The side that can protect its own LOC while interdicting those of the enemy will prevail. Water sources are vital, especially if